

Project Administration Manual

Project Number: 49026-002
Loan Number: Lxxxx
November 2017

Socialist Republic of Viet Nam: Basic Infrastructure
for Inclusive Growth in the Northeastern Provinces
Sector Project

ABBREVIATIONS

| | | |
|--------|---|---|
| ADB | – | Asian Development Bank |
| ARVC | – | Agricultural and Rural Value Chain |
| BIIG 1 | – | Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project |
| COL | – | Concessional Ordinary Lending |
| CSB | – | Community Supervision Board |
| DARD | – | Depart of Agriculture and Rural Development |
| DED | – | Detailed Engineering Design |
| DMF | – | Design Monitoring Framework |
| DOF | – | Department of Finance |
| DOIT | – | Department of Industry and Trade |
| DPI | – | Department of Planning and Investment |
| EA | – | Executing Agency |
| EARF | – | Environmental Assessment and Review Framework |
| EMP | – | Environmental Management Plan |
| FS | – | Feasibility Study |
| GAP | – | Gender Action Plan |
| GOV | – | Government of Viet Nam |
| HLS | – | HortLangSon |
| IEE | – | Initial Environmental Examination |
| IFAD | – | International Fund for Agricultural Development |
| LIC | – | Loan Implementation Consultants |
| M&E | – | monitoring and evaluation |
| MOF | – | Ministry of Finance |
| MPI | – | Ministry of Planning and Investment |
| NCB | – | National Competitive Bidding |
| NGO | – | Non-government Organization |
| NEP | – | Northeastern Provinces |
| ODA | – | Official Development Assistance |
| PAM | – | Project Administration Manual |
| PCU | – | Project Coordination Unit |
| PMU | – | Project Management Unit |
| PPC | – | Provincial People’s Committee |
| PPMS | – | Project Performance Management System |
| PPTA | – | Project Preparation Technical Assistance |
| PPSC | – | Provincial Project Steering Committee |
| PPSSF | – | Project Preparation Start-up Support Facility |
| QCBS | – | Quality and Cost Based Selection |
| RE MDF | – | Resettlement Ethnic Minority Development Framework |
| REMDP | – | Resettlement Ethnic Minority Development Plan |
| SBV | – | State Bank of Vietnam |
| SRM | – | Staff Review Meeting |
| VWU | – | Vietnam Women’s Union |
| WB | – | World Bank |

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Project Administration Manual Purpose and Process

The project administration manual (PAM) describes the essential administrative and management requirements to implement the project on time, within budget, and in accordance with the policies and procedures of the government and Asian Development Bank (ADB). The PAM includes references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the PAM.

The Provincial People's Committees (PPCs) of the four northeastern provinces¹(NEPs) which are the executing agencies (EAs), the four NEPs' Provincial Departments of Planning and Investment (DPIs) which are the implementing agencies (IAs) or project owners, and the respective Project Management Units (PMUs) under the IAs, are wholly responsible for the implementation of the ADB-financed project, as agreed jointly between the borrower and ADB, and in accordance with the policies and procedures of the government and ADB. ADB staff is responsible for supporting implementation including compliance by PPCs and DPIs for the four NEP of their obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.

At loan negotiations, the borrower and ADB shall agree to the PAM and ensure consistency with the financing agreements. Such agreement shall be reflected in the minutes of the loan negotiations. In the event of any discrepancy or contradiction between the PAM and the financing agreements, the provisions of the financing agreements shall prevail.

After ADB Board approval of the project's report and recommendations of the President (RRP), changes in implementation arrangements are subject to agreement and approval pursuant to relevant government and ADB administrative procedures (including the Project Administration Instructions) and upon such approval, they will be subsequently incorporated in the PAM.

¹ Bac Kan, Cao Bang, Ha Giang, and Lang Son

I. PROJECT DESCRIPTION

1. The proposed project will (i) rehabilitate and upgrade about 265 kilometers of roads in the four northeastern provinces (NEPs); (ii) install 10 rural domestic water supply (RDWS) schemes; (iii) provide infrastructure support for agricultural and rural value chains (ARVC) in Lang Son; and (iv) strengthen provincial infrastructure asset management.²

A. Impact and Outcome

2. The project is aligned with the following impact: sub-regional competitiveness of the four northeastern provinces enhanced.³ The project will have the following outcome: Production, service delivery, and movement of goods and passengers sustainably increased.⁴

B. Outputs

3. **Output 1: Road network connectivity improved.** The output will upgrade about 121 kilometers of provincial and about 144 kilometers of district roads, which will improve overall network efficiency by integrating interprovincial travel, transport, and commerce, as well as improve connectivity into border crossings. Many isolated, poor rural communities will access the transport network at lower cost, leading to social benefits. Reduced transport costs and improved rural access will make small and medium enterprises (SMEs) more competitive, and enhance rural development initiatives. The improved network connectivity addresses significant barriers to the development of tourism circuits. Road safety will be included in subproject design, with 44 traffic calming measures forcing reductions in vehicle speed, and 13 safety awareness trainings for vulnerable road users such as school children. Output 1 will benefit approximately 44 rural communities, comprising 160,000 people in 27,411 households.

4. **Output 2: Rural water supply improved.** About ten RDWS subprojects will be designed and constructed to meet the 2030 forecasted demand. Clean water is essential for (i) public health, which is particularly important for communities located far from medical facilities; (ii) ARVCs, as clean water is needed to wash produce, and for creating sanitary conditions at an early stage of value addition at farm and aggregation points; and (iii) developing facilities to support tourism. Output 2 will serve 22 communes, comprising 42,300 people in 10,000 households by 2023.

5. **Output 3: Agricultural and rural value chain infrastructure in Lang Son province improved.** The output will increase the viability and incomes of local enterprises and rural producers by supplying high-quality food, spices, and flowers to (i) international markets, (ii) northern Vietnamese urban centers, and (iii) local tourist sites. The project will support horticultural trade and marketing organizations and services for at least five horticultural commodities. Apart from Lang Son, the other project provinces continue to benefit from substantial International Fund for Agricultural Development (IFAD) support for ARVC development. Based on successful IFAD experiences, in Lang Son, the project will introduce market-based business plans, provide viability gap grants to at least 30 existing value chain enterprises to leverage investment into value-adding technology and productive infrastructure, and support 80 producer groups for investing in market-linked quality control, production, and

² ADB provided project preparatory technical assistance for preparing the Basic Infrastructure for Inclusive Growth Sector Project – Four Northeastern Provinces (TA-8957-VIE).

³ NEPs. 2015. *Overall Development Plan of Mountainous Northeastern Provinces of Viet Nam to 2020*.

⁴ The design and monitoring framework is in Section VII.

post-harvest infrastructure. Better transport from output 1 and clean water from output 2 will contribute essential support for competitive ARVCs in all of the provinces. Output 3 will benefit three communes comprising 10,400 people in 3,000 households

6. **Output 4: Decentralized public asset management processes established.** ADB is supporting the decentralized public asset management program. The provinces will procure asset management hardware and systems, and carry out associated staff training. The systems will include indicators and tools to allow monitoring of annual maintenance budgets and their funding, as well as moving to life-cycle-based investment decisions for future asset procurement and sustainability.

C. Subprojects

7. The following table presents the number of candidate subprojects identified during the project preparation technical assistance (PPTA).

Table 1: Table of Subprojects

| Output | Bac Kan | Cao Bang | Ha Giang | Lang Son | Total |
|--|---------|----------|----------|----------|-------|
| 1. Road network connectivity improved | | | | | |
| Representative subproject with prepared FS | 1 | 1 | 1 | 1 | 4 |
| Additional subprojects | 2 | 2 | 2 | 3 | 9 |
| Number of additional subproject FS prepared by PPTA | | 1 | 1 | | 2 |
| 2. Rural water supply improved | | | | | |
| Representative subproject | 1 | 1 | 1 | - | 3 |
| Additional subprojects | 2 | 1 | 1 | 3 | 7 |
| 3. Agriculture and rural value chain Infrastructure in Lang Son province improved | | | | | |
| Representative Value Chain subproject | 0 | 0 | 0 | 2 | 2 |
| Additional subprojects | 0 | 0 | 0 | 3 | 3 |

Subproject eligibility, selection, feasibility and approval processes

8. Subproject general eligibility criteria:

- (i) included in the provincial medium-term investment plan or approved by the standing committee of the Provincial People's Council;
- (ii) aligned with the four NEPs Master Plan; and
- (iii) endorsed by the provincial people's committees (PPCs) for inclusion in the project.

9. Subproject field screening by the government and ADB for a prima facie check of adherence to:

- (i) High potential to complement other ADB, and other development partners – especially the IFAD investment projects;
- (ii) Prioritize the preservation, improvement and sustainability of the current asset base over new construction;

- (iii) Appear to be within ADB safeguard categories B and C;
- (iv) Have relatively simple and logical designs;
- (v) Be capable of completion with a minimum of civil works contract packages;
- (vi) Be within the local capacity to maintain and manage;
- (vii) Have a sustainability focus, taking into consideration capacity building needs and training needed to develop, manage, and use the infrastructure;
- (viii) Provincial and district governments formally commit to (a) ensuring funding for O&M compliance and (b) providing counterpart funding.
- (ix) **Output 1: Road subprojects:** Road infrastructure at the provincial, district and local levels will represent the bulk of investment. Investments may include: (a) lengths of road sections; (b) bridges and other cross drainage structures; (c) measures to stabilize the environment around the assets against climate change impacts such as landslides; and (d) road and traffic safety intervention. The road subprojects will:
 - a. Contribute to the cross-provincial, common development plan and goal agreed during PPTA processing and inception;
 - b. Involve cooperation with at least one neighboring province or with the People's Republic of China;
 - c. Contribute to increased private sector participation, including improvement in the environment for private sector investment and development;
 - d. Contribute to improved road safety outcomes in the district/province;
 - e. Be consistent with medium and long-term sector and socio-economic development plans at the four NEPs, provincial and district levels;
 - f. Supports inclusive development by promoting engagement of rural communities as beneficiaries of subprojects; and
 - g. Have investment levels estimated in the range of \$4 to \$25 million (with any exceptions specifically justified).
- (x) **Output 2: Rural water supply:** The subprojects will be bundled into infrastructure packages that cover the entire system from source to user. The packages could include all, or some, of the elements such as: wells, pumps, reservoirs, tanks, treatment units, meters, pipes, control systems. The RDWS subprojects will have:
 - a. to the extent possible, RDWS schemes developed to support use beyond domestic purposes, such as livestock, gardening and even irrigation;
 - b. assets operated and managed by provincial or municipal water supply companies;
 - c. proven demand for connections to the water supply;
 - d. a clear tariff adequacy assessment that fits the thresholds for affordability, O&M costs requirements and management and administration costs;
 - e. investment levels estimated in the range of \$1 to \$5 million (with any exceptions specifically justified).
- (xi) **Output 3: ARVC Infrastructure Investment:**
 - a. linked to horticultural crops that have proven market demand and opportunities;
 - b. incorporate actors along the value chain including value addition, aggregation,

and marketing by ensuring the vertical and horizontal linkages between actors are developed and maintained;

- c. The packages could include all, or some, of the elements such as: feeder roads, small scale water use efficient irrigation technology, shade hoses, value addition technologies, market improvements, post-harvest facilities; waste management systems.

10. Subprojects feasibility studies (FS) will be carried out based on the above criteria. The FS will determine if the subproject meets all relevant ADB and government due diligence requirements and thresholds.

11. Only subprojects with an approved FS will be eligible to proceed with detailed engineering design (DED) process that will require updated safeguard, costs and viability assessments prior to receiving ADB financing:

- (i) Met the above described field screening criteria;
- (ii) Adhere to relevant Vietnamese national standards and specifications as minimum standard;
- (iii) Comply with the government and ADB safeguard guidelines and involve a minimum of negative environmental and social/resettlement impacts, i.e. only ADB Safeguard Category B or C should be considered;
- (iv) Incorporate appropriate climate change measures into detailed designs;
- (v) Are for roads and water supply schemes economically feasible according to the agreed ADB criteria for economic rate of return of 9% for economic development and 6% if there is prior agreement with ADB regarding the social impact of the proposed investment;
- (vi) For enterprise or producer group support the proposed subprojects need to be financially sustainable, and economically viable;
- (vii) Have Procurement packages have been clearly identified in conformity with the procurement plan as well as the method of procurement, cost estimates have been clearly identified and recorded;
- (viii) Public hearings using established organizations on the subproject proposal have been held in concerned communes and measures for future public consultation and supervision by the Community Supervision Board (CSB) are clearly spelled out with each consultation recorded as validation;
- (ix) Include appropriate climate change measures into the subproject preliminary engineering designs as per the climate change guidelines prepared during the PPTA; and
- (x) For road subprojects include road and traffic safety considerations into the DED and for vulnerable road users.

12. The long list of subprojects, that represent the scope of the project investment in output 1 and 2, including the representative subprojects that had PPTA supported feasibility assessments highlighted, is presented in Annex C.

II. IMPLEMENTATION PLANS

13. The project readiness activities are presented in section A, and the implementation schedules are presented in section B below. For outputs 1 and 2, the schedules are mostly linked to procurement activities that lead to civil works programs. Output 3 however requires several sets of activities that need to be sequenced and integrated and as such a detailed Project Management and Implementation Manual for Lang Son PMU has been prepared (see Annex G).

A. Project Readiness Activities

Table 2: Viet Nam Project Readiness Filter

Updated on: 10 November 2017

Project Name: Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project

| Summary of Project Readiness | | | | | |
|---|---------------------------------|----------------|---------------------|---------------|--|
| <ul style="list-style-type: none"> - Advance actions agreed and included in the Government's Investment Policies - PAM prepared - PMU organization structure and staffing proposed and included in PAM - Government's Project Proposal has been approved on 10 May 2017 - Government's Investment Policies has been approved by Prime Minister on 17 August 2017. | | | | | |
| Actions | Date of Action Completed | By Whom | By When | Status | Projected date for meeting the milestone and actions required |
| 1.1 Concept Paper includes an assessment of required readiness level of the project (high level readiness vs. low level). <ul style="list-style-type: none"> - Management and team to agree on the required level of readiness, timeline for project processing and possible funding source for Detailed Design. - For large infrastructure type projects, a separate funding (such as an ongoing loan, a TA loan or Project Preparation and Start-up Support Facility) or piggybacking from the ongoing loan is identified (so that the recruitment of Detailed Design consultants can be processed before the project's approval). - Safeguard categories are discussed and agreed. | 14 Sept. 2015 | ADB | Concept Paper Stage | Completed | Concept Paper approved on 14 September 2015 |

| Actions | Date of Action Completed | By Whom | By When | Status | Projected date for meeting the milestone and actions required |
|--|--------------------------|--------------------|---------------------|--|---|
| 1.2 Advance actions agreed to be included in Government's Investment Policy or Pre -FS <ul style="list-style-type: none"> - Joint proposal of EA/ADB to this effect reflected in the mission Aide Memoire - Advance Actions to include preparation and approval of procurement related activities and resettlement framework/plan. | 14 Sept. 2015 | EA/ADB | Concept Paper Stage | <ul style="list-style-type: none"> - Advance actions (AAs) reflected in the Reconnaissance MoU - AAs include preparation of additional subproject FS, DEDs for representative subprojects. | Concept Paper approved on 14 September 2015 |
| 2.1 Investment Policy or Pre-FS submitted to the Prime Minister <ul style="list-style-type: none"> - Agreed advance actions included - Proposed financial conditions and mechanism applied to the project, repayment method and financial capacity of EA included | | EA | Before Fact Finding | <ul style="list-style-type: none"> - IP is prepared with inclusion of agreed advance actions - Submitted to PM | <ul style="list-style-type: none"> - Project Proposal approved on 11 May 2017. - IP submitted to PM on 15 May 2017. |
| 2.2 Investment Policy or Pre-FS approved by the Prime Minister Appraisal Committee provides its recommendation to Prime Minister with inputs from MPI, MOF, SBV and other relevant ministries | 17 August 2017 | EA/ Prime Minister | Before SRM | Completed | <ul style="list-style-type: none"> - Project Proposal approved on 11 May 2017. - IP approved by PM on 17 August 2017. |
| 2.2.1 Financial mechanism and on-lending modality reviewed by MOF as a part of inputs to the Appraisal Committee's recommendation | May 2017 | MOF | Before SRM | Completed. | |
| 2.3 Project Administration Manual prepared and agreed to with ADB (PAM to include the following 2.3.1 to 2.3.4) | | EA/ADB | Before SRM | PAM prepared and agreed | |

| Actions | Date of Action Completed | By Whom | By When | Status | Projected date for meeting the milestone and actions required |
|---|--------------------------|---------|------------|--|---|
| 2.3.1 Procurement Plan detailing contract packages, procurement modality, decision making structure and schedule are ready; agreed to with ADB | | EA/ADB | Before SRM | Procurement plan prepared and included in PAM | |
| 2.3.2 Financial management system, audit arrangement, fund flow oversight established: agreed to with ADB | | EA/ADB | Before SRM | Included in PAM | |
| 2.3.3 Resettlement Framework/Plan and Ethnic Minorities Development Framework/Plan (if relevant) are prepared and agreed to with ADB | 27 April 2017 | EA/ADB | Before SRM | REDMF/REMDPs prepared and agreed to with ADB. | |
| 2.3.4 Environment Safeguard Documents are prepared and agreed to with ADB - Environment Impact Assessment (EIA), incl. Environment Management Plan (EMP) for Category A Projects - Initial Environment Examination, including EMP for Category B Projects | 27 April 2017 | EA/ADB | Before SRM | - Final EARF submitted to ADB - 8 IEEs of representative subprojects completed and submitted to ADB | |

| Actions | Date of Action Completed | By Whom | By When | Status | Projected date for meeting the milestone and actions required |
|--|--------------------------|---|----------------|---|---|
| 2.4 Funding source for detailed engineering design agreed between EA and ADB, and draft detailed TORs for detailed engineering design consultants and project supervision consultants ready | | EA/ADB | Before SRM/MRM | <ul style="list-style-type: none"> - DEDs are either funded by Government or by Loan 2982-VIE (PPSSF) - TORs being prepared for DED consultant. - Detailed TORs for supervision consultant is included in the PAM and expected to be advertised in Q2/2018 | |
| 2.5 Fund mobilization plan for land acquisition and resettlement plan prepared | 9 May 2017 | EA/ADB | Before SRM/MRM | Prepared and submitted to ADB | |
| <p>2.6 Government's Feasibility Study is completed and approved by the competent authority.</p> <ul style="list-style-type: none"> - EA assigns Project Owner to complete the FS; MPI, MOF and other related agencies to provide opinions - Agreed procurement plan to be included to avoid a separate approval process - EIA/EMP of government to be included to avoid a separate approval process | August 2017 | <p>National Assembly for National Projects</p> <p>EAs for Projects category A, B, C</p> | Before SRM/MRM | Completed and approved | |

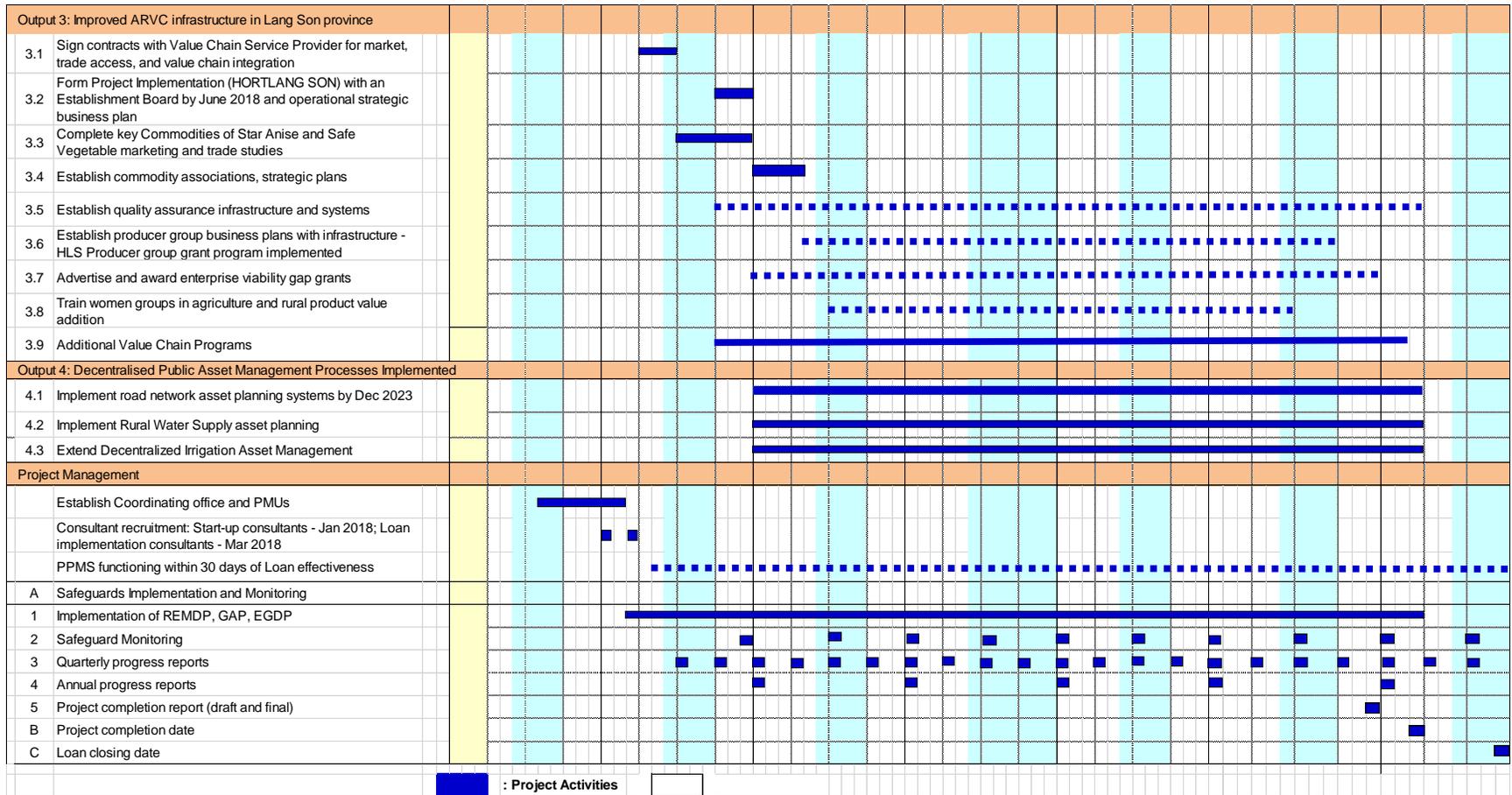
| Actions | Date of Action Completed | By Whom | By When | Status | Projected date for meeting the milestone and actions required |
|--|--------------------------|---------|----------------------|---|--|
| 2.6.1 For on-lending to SOEs: The Ministry of Finance and on-lending agency complete appraising the financial capacity of sub-borrower and project repayment ability (this criterion will be revised when new Decree on on-lending is approved by the Prime Minister). The appraisal is only started once the Prime Minister approves the investment policy and EA complete FS of Project. | | MOF | By Loan Negotiations | N/A | N/A |
| 3.1 PMU establishment officially announced with core PMU staff in place | | EA | By Loan Negotiations | PMU structure and staffing included in PAM and reflected in MoU | |
| 3.2 Call for Expression of Interest and/or Request for Proposal for detailed engineering design consultancy work and project supervision consultants advertised or issued | | EA | By Loan Negotiations | | Expected to be advertised/issued in Q1/2018 for DEDs, LIC, and Q2/2018 for supervision consultants |

Notes:

1. Advanced Actions (Article 19, Decree 16 on ODA). Line agency may implement advanced actions during the preparation phase of programs/projects, including:
 - a. After the competent authority issues the decision on investment policy, the line agency will assign the agency proposing program/project to (i) Prepare and submit to competent authorities for approval of the Resettlement Policy Framework during the appraisal process of program/project documents and investment decision; (ii) Develop procurement plans; prepare documents for expression of interest, pre-qualification documents, bidding documents and Request for Proposal for consultant recruitment.
 - b. After the investment decision is issued by competent authorities and until a specific international agreement of ODA and concessional loan program/project is effective, line agency shall implement the following activities (i) Appraise and approve procurement plans, documents for expression of interest, pre-qualification documents, bidding documents and Request for Proposal, select bidders, appraise and approve results of selection, negotiate and finalize contracts for packages of goods procurement and constructions for activities to be implemented during the first 12 months of the programs and projects, and consulting service packages (project management consultants, technical design consultants, supervision consultants, resettlement, environment and social safeguards consultants); (ii) Contracts on goods, constructions and consulting services as prescribed in part a of this Article can only be signed after the effectiveness of the specific international treaty on ODA and concessional loans of the program or project.
 - c. Financing resources for implementation of advanced actions is allocated by project owner from project preparation funds or advanced and reimbursed retroactively from project funds on the basis of prior agreement with donors.
2. For Category C project, not required but ADB staff conducts desk review.
3. Decree 18/ND-CP: "Environmental Protection Planning, Strategic Environmental Assessment, Environmental Impact Assessment" guides how to prepare EIA and EMP in Government format.
4. ADB's Terminology (a) Fact Finding: Mission to confirm the project/program design, costs, financing plan, implementation arrangements, and design and

monitoring framework, among other, by examining the project/program from technical, financial, economic, environmental, social, and management viewpoints; (b) SRM: Staff Review Meeting. SRM is held to seek Management approval for (i) the project/program design (including all of the above confirmed at fact-finding) and (ii) proceeding to loan negotiation.

5. Millstone actions can be initiated and/or completed well before milestones event occurs.



III. PROJECT MANAGEMENT ARRANGEMENTS

A. Project Implementation Organizations – Roles and Responsibilities

1. Ministry of Finance (MOF)

14. The MOF is the borrower's representative accountable for managing all funds received for the implementation of the overall project. MOF will provide all on-lending agreements for Provincial Department of Treasury.

2. Executing Agencies (EA)

15. Each PPC will be an EA. The PPCs shall assign one PPC member with a rank of Chairperson/Vice Chairperson to assume overall responsibility for implementation coordination within each province. For key project activities, the Chairperson/Vice Chairperson will be the approving authority.

3. Implementing Agencies (IA) – Project Owner

16. Each of the PPCs has confirmed that the Department of Planning and Investment (DPI) is assigned the role of Project Owner (the equivalent to an ADB Implementing Agencies [IA]) as per Decree 16⁵. The IA has authority and the delegated responsibility to form a Provincial Project Management Unit (PMU) and is legally required to do so within 30 days of FS approval.

4. Provincial Project Steering Committee (PPSC)

17. Each PPC will form a provincial level steering committee under the leadership of a PPC Vice-chairperson and the Project Director (PMU). The PPSC will include Directors from each of the associated provincial departments: Department of Planning and Investment (DPI), Department of Transport (DOT), Department of Industry and Trade (DOIT-Lang Son), Department of Science and Technology (DOST), Department of Natural Resources and Environment (DONRE), Department of Finance, Department of Construction, Office of PPC, Chairperson/Vice Chairperson of relevant districts, Women's Union (for EM) and Department of Agriculture and Rural Development (DARD). The PPSC shall meet biannually, or as decided by the PPC, as part of the project planning and review process and meet on request of the Project Director through the PPC.

5. Project Management Unit

18. Each province will have its own PMU – the implementing unit. The PMU will be directly responsible to DPI – the structure and staffing of each PMU is outlined in Section E below, including PMU Management, heads of departments, staff responsible for safeguards, financial management and procurement for ADB's review and concurrence prior to assigning and staffing. In accordance with Decree 16, within 30 working days after the project is approved by the competent agency, the project owner shall issue a decision on establishment of the PMU. When establishing the PMU, each of the Provincial project owners have indicated their intention to create a new PMU.

⁵ Government of Viet Nam. 2016. *Decree No. 16/2016/ND-CP dated 16 March 2016 on Management and Utilization of Official Development Assistance and Concessional Loans of international donors*. Hanoi.

19. The Director of the PMU will be appointed by DPI. S/he will have experience in the management and implementation of official development assistance (ODA) projects and will be familiar with ADB requirements and procedures. The PPC through DPI will provide office support to the unit.

20. The PMUs will provide day to day project implementation management. The government should ensure that the PMUs have a capacity to work in the English language. The importance of counterpart staff with substantial relevant experience in key positions was also highlighted.

6. HortLangSon

21. HortLangSon will be a private sector led association that is a joint public private initiative to provide marketing, trade and logistics, market intelligence, quality assurance service platform for the horticulture (including fruit, spice, herbs and vegetable crops) grown in Lang Son. The Association will function and report publicly to the PPC via the PMU (Lang Son) and will have a mixed public private sector board of directors. It will be responsible for the coordination of value chains, the award of competitive grants for producer groups, and viability gap grants for private sector enterprises, the financing of quality assurance systems and for trade and product advocacy.

7. Project Coordination Unit

22. A coordination unit will be established in Lang Son PMU. The coordination unit will support PMUs and be responsible for coordinating work planning, compiling quarterly and annual progress reports, coordinating ADB missions, and supporting for project coordination meetings, as needed.

Table 3: Management Roles and Responsibilities

| Project Implementation Organizations | Management Roles and Responsibilities |
|---|---|
| Borrower Ministry of Finance (MOF) | <ul style="list-style-type: none"> ➤ MOF will sign the on-lending agreements for each Province. ➤ MOF controls the disbursement and sign on withdrawal applications (WAs) to allow disbursement |
| Executing Agencies Provincial People's Committee (PPC) | <ul style="list-style-type: none"> ➤ The PPCs of each Project province will be responsible for overseeing the project activities within their province. They will coordinate with each other through the project steering committee. ➤ Each PPC will appoint one Vice-chairperson to be responsible for the project ➤ Each PPC will ensure the availability of counterpart funding on time ➤ Approve procurement plans of subproject works, consultant recruitment, and subproject detailed designs. |
| Implementing Agencies (IAs) Department of Planning and Investment (DPI) | <ul style="list-style-type: none"> ➤ The DPIs as project owner (and IAs) of each province will be responsible for the implementation of the project activities within their province. The IAs will coordinate with each other under the leadership of the coordinating unit established in Lang Son PMU. ➤ The IAs will ensure that its staff structure has sufficient expertise in all sectors involved in the project, especially transport and water supply and for functional roles in procurement and financial management ➤ The IAs will coordinate and consult with DOTs and DOC, DARD, |

| Project Implementation Organizations | Management Roles and Responsibilities |
|---|---|
| | <p>DOIT and other departments under their respective PPCs on technical matters, especially procurement, recruitment of consultants and implementation of works on road, rural water supply and ARVC works, related to subproject implementation.</p> <ul style="list-style-type: none"> ➤ The IAs of each province will be the approving authority for procurement of subproject works, consultant recruitment, and subproject detailed designs. ➤ The IAs will: <ul style="list-style-type: none"> • have overall responsibility for the implementation of the project; • prepare annual work plans with supporting budget projections; • ensure compliance with loan covenants; • submit disbursement projections and ensure counterpart fund allocation; • have overall financial management responsibility; • ensure that project implementation complies with ADBs safeguard policy and provisions in the EMPs and REMDPs and GAP; • propose changes to project design, scope or implementation arrangements, if required; • approve procurement outcomes and sign contracts; and • approve and submit progress reports and project workplans. |
| <p>Implementing Units Project Management Units (PMU)</p> | <ul style="list-style-type: none"> ➤ Each IA will establish a PMU to be responsible for the day to day implementation of project activities. Among others, the PMU will be responsible for: <ul style="list-style-type: none"> • Establishing a project advance account at a commercial bank nominated by SBV and acceptable to ADB for disbursement of eligible expenditures under the loan; • Managing, replenishing, and liquidating the account; and be fully accountable and responsible for the proper use of advances to the advance account; • Preparing and signing WAs; • Day to day operation and management of the project; • Advance actions for recruitment of recruitment of loan implementation consultant, and consultant for preparation of detailed designs. • Recruitment of loan implementation consultants and other consultants; • Supervising the preparation of additional subproject feasibility reports; • Contracting of the service provider for output 3; • Reviewing annual work plans and budgets for output 3; • Approving all contracts, grants for implementation of output 3; • Prepare bidding arrangements/documents and evaluating bids for the procurement of subproject civil works contracts; • Supervise civil works contractors; • Update social and environment safeguard documents and |

| Project Implementation Organizations | Management Roles and Responsibilities |
|---|--|
| | <p>submit to ADB for clearance prior to implementation;</p> <ul style="list-style-type: none"> • Monitor implementation of REMDPs; • Ensure environmental protection and mitigation measures (in the EMPs) are incorporated in detailed designs and contract awards; • Implementing GAP and reporting on GAP implementation status to ADB on regular basis; • Ensure implementation of the EMPs and submit regular monitoring reports through the IAs to the EAs and Project Coordination Unit; • Assist in obtaining necessary environmental approvals from the respective departments of natural resources and environment prior to awarding civil works contracts; • Submit regular (quarterly and annual) project reports to BIIG1 coordination unit; • Implement Poverty Reduction and Social Strategy, Stakeholder Participation Plan and report results to Project Coordination Unit regularly as required by ADB; • Set up and maintain project financial system and be responsible for project payments through the approved bank accounts; • Coordinate and liaise with line agencies and other agencies as appropriate on common policy, regulatory context, implementation procedures and financial issues; • Day to day coordination and liaison between the four PMUs and communications to the Project Steering Committee and other relevant agencies; • Undertake quality control inspections of the project facilities during construction and on completion; • Manage project facilities handover O&M related agencies; • Organization of training programs; • Procurement of office equipment, goods as needed etc. |
| Project Coordination Unit – Lang Son | <ul style="list-style-type: none"> ➤ The Project Coordination Unit (PCU) will report directly to the Project Director PMU Lang Son. ➤ Responsible for supporting the project coordination meetings when called by the four NEP in terms of logistic support, minute taking and distribution. ➤ Support the PD Lang Son to convene, run and record Project level planning and progress meetings within the assigned time periods of (i) within two months of the end of the year and (ii) 30 days of the mid-year. ➤ Consolidate reports and submit to ADB. ➤ Maintain Project level records and documentation including the Project level PPMS data sets, archived reports and documentation. ➤ Support ADB missions in terms of coordination and logistics. ➤ Consolidate the project financial statements for audit. |

| Project Implementation Organizations | Management Roles and Responsibilities |
|---|---|
| <p>PMU Staff to be reviewed for Government – ADB concurrence</p> | <p>Project Director of Coordinating Province⁶</p> <p>Qualification: University degree in relevant subject; a senior government official at a level of at least department deputy director; English language fluency is preferred or an effective arrangement for interpretation is put in place.</p> <p>Experience: 15 years of project management experience in rural infrastructure and a minimum of 5 years of experience in managing multilateral donor projects with responsibility for directing project implementation.</p> <p>Responsibilities:</p> <ul style="list-style-type: none"> ➤ Provide leadership and responsibility for managing the coordination of project management requirements as defined by (a) the Government of Viet Nam and the Asian Development as detailed in the Loan Agreements and on-lending agreements, (b) the Project Administration Manual and its supporting annexes. ➤ Ensure the timely preparation of project level planning systems, through the establishment of work planning formats, timing of agreed plans, and the consolidation of planning documents from all four provinces ➤ Maintain open communication and consultation with Executing Agencies and Project Owners within all four provinces to ensure that deadlines, implementation constraints, and Donor / Government of Viet Nam reporting and management information systems ➤ Consult with all Provincial Management Units and Project Directors to identify implementation constraints, to ensure that activities that are either delayed or no longer possible are identified with proactive management proposals presented to ADB in a timely manner ➤ Provide day to day management oversight to staff assigned to the Project coordination unit including the provision of quality assurance of documentation in terms of (i) accuracy and completeness of content, (ii) timeliness of inputs and outputs, (iii) language adequacy. Be able to ensure that the requirement of ADB submissions are achieved ➤ Provide feedback and reporting to all four Project Owners on implementation issues and risks that may determine project success ➤ Be responsible for annual project reports that consolidate project information across the four EAs and present this in the required format for ADB. ➤ Provide supervision and Project Owner linkages for the Deputy Director of the Project Management Unit responsible for managing the implementation of the Provincial investment program. |
| <p>Community Supervision Board (CSB) with guidance of the Commune People committee</p> | <ul style="list-style-type: none"> ➤ The CSB will be responsible for representing the community for the implementation of: <ul style="list-style-type: none"> • all community development activities under GAP and REMDPs; • organizing public consultations; • design and implementation monitoring as guided by the |

⁶ The EA (i.e. Lang Son PPC) will provide sufficient evidence that its proposed Project Director responsible for Project Coordination meet the requirements prior to Loan Effectiveness.

| Project Implementation Organizations | Management Roles and Responsibilities |
|--------------------------------------|--|
| | supervision engineer; and <ul style="list-style-type: none"> • grievance redress mechanism |
| Asian Development Bank (ADB) | <ul style="list-style-type: none"> ➤ ADB is the principal financier and will: <ul style="list-style-type: none"> • provide loan financing for the project; • monitor overall project implementation, disbursement, procurement, consultant selection, and reporting; • monitor schedules of activities, including funds flow; • review compliance with agreed procurement procedures; • review compliance with loan covenants; • monitor effectiveness of safeguard procedures (including GAP); • monitor conformity with ADB anti-corruption policies; • undertake periodic review missions, including midterm; and • provide review of documentation for prior approval of procurement and contracting procedures within the agreed service standards |

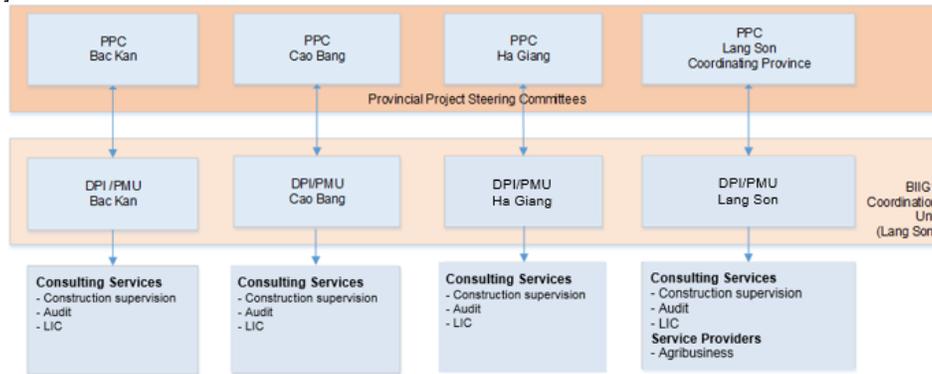
B. Project Coordination

23. At the provincial level, the Project will operate under the oversight of a steering committee that will be under the chairmanship of the PPC and will have representation from (i) DPI, (ii) PMU Project Director and (iii) participation from other agencies such as DOT, DARD, DOLISA, and DOIT. The Steering committee will review progress, proposed work plans, and provide direction and guidance in four NEP sub-regional policy and national program initiatives.

24. Coordination of work planning and reporting to ADB will be supervised by Lang Son Province which the government has delegated responsibility for overall project coordination. Each provincial PMU Project Director will conduct their own provincial level planning and biannual reviews and then use these as input to the overall project planning and review reports. The overall project plans and reviews will be developed in at least two meetings to be convened under the chairmanship of the Project Director (Lang Son). The preparation of consolidated annual work plan and biannual progress report will be supported by the coordination unit that operates out of the Lang Son PMU. The coordination unit will provide secretariat services to the PMUs on an as needed basis – see

Figure 1 and will provide a contact point to ADB for day to day communication.

25. All project management, administration, and procurement will be decentralized to each of the four NEP PMUs as per the directives of Decree16 with the approvals for procurement being at the PPC or delegated Project Owner (IA).

Figure 1: Project Coordination Arrangements

C. Subproject Implementation Procedures

26. Subproject implementation (see Annex D for a detailed breakout of all steps involved in the implementation of subprojects (both representative and additional)) will include the following steps:

- (i) Preparation of feasibility and safeguard studies including IEEs, EMPs, REMDPs, GAP with a preliminary engineering design and supporting bill of quantities detailed cost estimate and financial (where required) and economic assessment;
- (ii) PMU conduct technical review and consultant updates;
- (iii) DPI submits to PPC the FS for approval;
- (iv) Implementation plan prepared;
- (v) ADB conduct review of FS for ADB safeguard compliance, and adherence to the agreed upon FS structure;
- (vi) FS and supporting implementation plan submitted to PPC for approval;
- (vii) DEDs contracted;
- (viii) Preparation of DED;
- (ix) Approval of DED by PPC after technical review;
- (x) Tendering for civil works;
- (xi) Construction, including technical and safeguard supervision and monitoring; and
- (xii) Commissioning, training and handover.

27. FS for additional subprojects will be prepared by the consultants recruited by the PMUs. They shall be responsible for the technical aspects of the FS including the economic and financial analysis, all social and safeguard issues and land acquisition assessments required for preparing the IEEs as required and where appropriate REMDPs, GAP, and Poverty and Social Assessments, and inclusion of road safety and climate resilient measures.

28. This will ensure that appropriate measures to (i) build and strengthen the inclusiveness of subprojects, and (ii) to mitigate any negative social impacts including special measures for land acquisition, compensation, ethnic minorities specific actions if required, and special measures to improve the participation of women and other disadvantaged groups as beneficiaries are taken.

29. Each PMU upon completion of the FS, shall use the consultant services provided through the loan implementation consultant (LIC), recruited by each province using counterpart funds, to review the FS to ensure that: (i) appropriate technical standards are incorporated in the design and that costs to be applied reflect realistic market estimates; and (ii) ADB's and the Government's

social and environmental safeguards requirements are duly addressed. Once approved, the PMU will inform the project owner DPI of the feasibility's acceptance. DPI will then submit the accepted FS to the PPC for approval. ADB will review FS and associated documents on request. Ultimate responsibility for FS compliance rests with each EA.

30. All additional subproject FS for plain, rural, and mountainous roads will include a traffic forecast derived from traffic counts of baseline traffic demand. The traffic forecasts will be presented in the summary of each feasibility study for the economic life of the proposed road investment. The technical design standard for the road engineering must be consistent with the assessed traffic demand - specified in daily Passenger Car Unit terms according to the Viet Nam Design Specification TCVN 4054 – see table 4.

31. Where the road traffic forecast spans more than one Passenger Car Unit category the standard to be applied will be based on the design category that is consistent with the traffic forecast at year 10 of the projection. Where the indicated design category differs from the Provincial master plan or the proposed subproject design standard indicated in the Government Investment Proposal (IP) the PMU/PPC will confirm the design standard to be used as the standard indicated by the traffic forecast under regulation TCVN 4054.

32. The economic assessment of the subproject must utilize the same traffic forecast data to ensure capital investment costs are consistent with the expected benefit streams. This requirement will remove bias of inflated Economic Internal Rate of Return (EIRR) estimates from the use of a higher traffic forecast, or alternately, applying a capital investment that is insufficient to construct the category of road required by the traffic forecast and the estimated project economic benefits.

**Table 4: Road Design Categorisation by Traffic Demand Forecasts
(Daily Passenger Car Unit)**

| Design Category (TCVN 4054 – 2005) | Design Traffic Volume (Daily Passenger Car Unit) |
|---|---|
| I | >15,000 |
| II | >6,000 |
| III | >3,000 |
| IV | >500 |
| V | >200 |
| VI | <200 |

33. ADB will confirm with a formal note to file for each subproject feasibility study that the road subproject feasibility assessment has a traffic forecast that is consistent with the proposed construction design category, and the projected traffic benefits used in the economic assessment.

34. Where there is any inconsistency, the ADB will notify the PMU/DPI that the subproject feasibility is not accepted and the subproject is ineligible for ADB financing.

35. In the event a subproject does not meet the required level of feasibility and eligibility criteria, a new subproject may be proposed by the EA and included in the project with the concurrence of ADB.

36. Output 3: Since Output 3 will only be carried out in Lang Son province the complete discussion of all implementational aspects is presented in Annex G.

D. Key Persons Involved in Implementation

Executing Agency

| | |
|---|---|
| Provincial People's Committees of Lang Son Province | Officer's Name: Mr. Ly Vinh Quang Position: Vice Chairman Telephone: (+84 205) 3812 605 Email address: ubndls@langson.gov.vn Office Address: Hung Vuong, Chi Lang, Lang Son City, Lang Son Province |
| Provincial People's Committees of Bac Kan Province | Officer's Name: Mr. Ly Thai Hai Position: Chairman Telephone: (+84 209) 3870425 Email address: vpubnd@backan.gov.vn Office Address: Group 1A, Phung Chi Kien, Bac Kan City, Bac Kan Province |
| Provincial People's Committees of Cao Bang Province | Officer's Name: Mr. Nguyen Trung Thao Position: Vice Chairman Telephone: (+84 206) 3852136 Email address: vpubndtinh@caobang.gov.vn Office Address: No.011, Hoang Dinh Giong, Cao Bang City, Cao Bang Province |
| Provincial People's Committees of Ha Giang Province | Officer's Name: Mr. Nguyen Minh Tien Position: Vice Chairman Telephone: (+84 219) 3860 661 Email address: vpubnd@hagiang.gov.vn Office Address: No.222, Nguyen Trai, Ha Giang City, Ha Giang Province |

Asian Development Bank

| | |
|--|---|
| Viet Nam Resident Mission | Staff's Name: Mr. Eric Sidgwick Country Director Telephone No.: (+84 24) 3933 1374 Email address: adbvrm@adb.org |
| Environment, Natural Resources & Agriculture Division, Southeast Asia Department | Staff's Name: Mr. Jiangfeng Zhang Director Telephone No: (+63 2) 6324444 Email address: izhang@adb.org |

Mission Leaders

Staff's Name: Mr. Charles David Salter
Position: Principal Natural Resources and Agriculture
Specialist
Telephone No.: (+856 21) 250 444
Email address: dsalter@adb.org

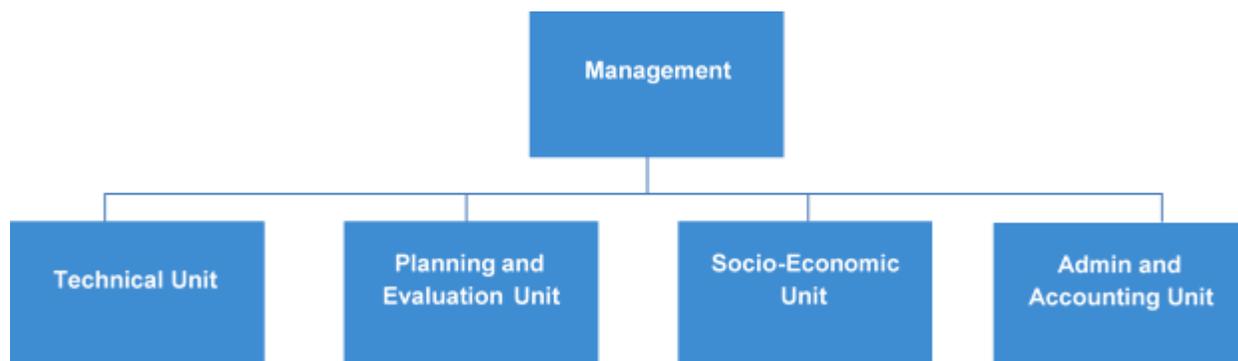
Staff's Name: Ms. Khuc Thi Lan Huong
Position: Project Officer
Telephone No.: (+84 24) 3933 1374
Email address: kthuong@adb.org

E. Project Management Units Structure

1. Bac Kan Project Management Unit

a. PMU Structure

Figure 2: PMU Structure



b. Staff Positions

37. The indicative staff position is presented in Table 5 with a total of 16 positions of which the Director and deputy director are identified as concurrent appointments from staff within the DPI. These two assigned positions will be concurrent assignments to the PMU with authority to approve and process approvals and contracts.

Table 5: Indicative Bac Kan Staffing

| No | Position | No. | Status |
|------------|---|-----|-------------------------|
| I | Management | | |
| | Director | 1 | Concurrent ^a |
| | Deputy Director - Full time | 1 | Concurrent |
| II | Technical Unit | | |
| | Urban engineer | 1 | Specialized |
| | Transport engineer | 1 | Concurrent |
| | Water supply engineer | 1 | Specialized |
| III | Planning and Evaluation Unit | | |
| | Planning staff | 1 | Concurrent |
| | Monitoring and Evaluation staff | 2 | Concurrent |
| | Procurement staff | 1 | Specialized |
| IV | Administration and Accounting Unit | | |
| | Chief accountant | 1 | Specialized |
| | Accountant staff | 1 | Concurrent |
| | Cashier/ Disbursement officer | 1 | Concurrent |
| | Admin/ Interpreter | 1 | Concurrent |
| | Driver | 1 | Concurrent |
| V | Social-Economic (Safeguard) Unit | | |
| | Environmental staff | 1 | Specialized |

| No | Position | No. | Status |
|----|---|-----------|-------------|
| | - Social safeguards officer (Resettlement/gender) | 1 | Specialized |
| | Total | 16 | |

^a Concurrent positions. Project funds only allowances not base salary,
Source: DPI Bac Kan

c. Loan Implementation Consultants

38. The loan implementation consultants (LIC) for the Bac Kan PMU include procurement, financial and safeguard support. The LIC will be funded through counterpart funds. All detailed designs, construction consultants are linked to the respective subprojects and is funded using counterpart funds.

Table 6: Indicative LIC

| Position | Person Month | Comment |
|----------------------------------|--------------|-------------------------|
| Nationals | | |
| A. Infrastructure Engineer | 40 | Advance action required |
| B. Procurement Specialist | 36 | Advance action |
| C. Financial Accountant – Senior | 60 | Donor experience, |
| D. Safeguards – Social | 10 | Donor experience, |
| E. Gender | 6 | |
| F. Safeguard – Environment | 24 | Donor experience, |

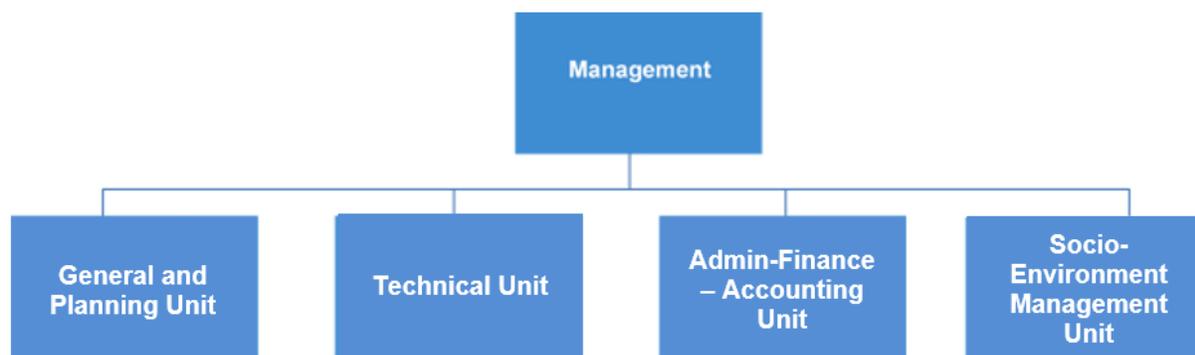
Source: Asian Development Bank estimates

2. Cao Bang Project Management Unit

a. PMU Structure

39. A total of 14 staff positions are envisaged within four departments under a Project Director.

Figure 3: Cao Bang PMU Structure



b. Staffing Proposal

40. The 14 staff positions are outlined in table 7 below. All positions will be full time appointments under contract. The role of Project Director will be concurrent and will be at a level of deputy director or above to enable authority to make approvals and enter into contracts.

Table 7: Indicative Cao Bang PMU Staffing

| No. | Position | Quantity |
|------------|---------------------------------|-----------------|
| 1 | PMU Director | 01 |
| 2 | PMU Deputy Director | 01 |
| 3 | Chief accountant | 01 |
| 4 | Procurement staff | 01 |
| 5 | Infrastructure staff | 01 |
| 6 | Social affairs staff | 01 |
| 7 | Environment staff | 01 |
| 8 | Finance-Accounting staff | 01 |
| 9 | Evaluation and monitoring staff | 01 |
| 10 | Interpreter | 01 |
| 11 | Coordinator | 01 |
| 12 | Admin staff | 01 |
| 13 | Archiving and cashier staff | 01 |
| 14 | Driver | 01 |
| | Total | 14 |

Source: DPI Cao Bang

c. Loan Implementation Consultant

41. The LIC for the Cao Bang PMU include procurement, financial and safeguard support. The LIC will be funded through counterpart funds. All detailed designs are linked to the respective subprojects.

Table 8: Indicative LIC

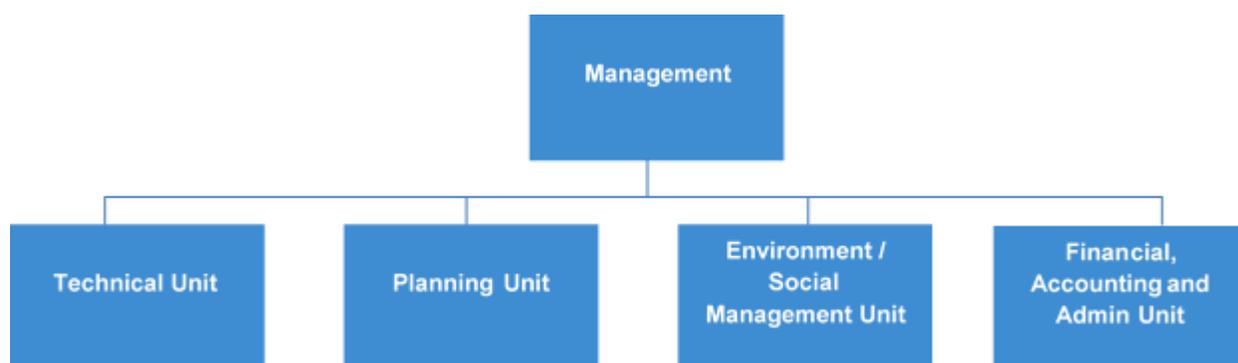
| Position | Person Month | Comment |
|----------------------------------|---------------------|-------------------------|
| A. Infrastructure Engineer | 40 | Advance action required |
| B. Procurement Specialist | 36 | Advance action |
| C. Financial Accountant – Senior | 60 | Donor experience, |
| D. Safeguards – Social | 10 | Donor experience, |
| E. Safeguard – Environment | 24 | Donor experience, |
| F. Gender | 6 | Donor experience |

Source: Asian Development Bank estimates

3. Ha Giang Project Management Unit

a. PMU Structure

Figure 4: Ha Giang PMU Structure



b. PMU Staffing

42. Ha Giang PMU will be staff with 17 full time positions based in Ha Giang City. The Project Director and Deputy Director will be concurrent positions from DPI with the Project Director being at least a Deputy Director.

Table 9: Indicative Ha Giang PMU Staffing

| No. | Position | Staff per Department |
|------------|--|----------------------|
| A | Management | 2 |
| 1 | PMU Director | |
| 2 | PMU Deputy Director | |
| B | Implementation Units | 15 |
| B.1 | Planning Unit | 3 |
| 3 | Manager Planning | |
| 4 | Deputy Manager Planning | |
| 5 | Procurement Officer | |
| B.2 | Technical Verification Unit | 5 |
| 6 | Manager Technical | |
| 7 | Deputy Manager Technical | |
| 8 | Project setup, fundamental design verification | |
| 9 | Inspection of construction drawings - estimates | |
| 10 | Project consultation, inspection and management | |
| B.3 | Financial, Accounting and Administrative Unit | 3 |
| 11 | Manager Finance and Accounting | |
| 12 | Deputy Manager Finance and Accounting | |
| 13 | Administration | |
| B4 | Environmental and Social Management Unit | 4 |
| 14 | Manager Safeguards | |
| 15 | Deputy Manager Safeguards/Gender Focal Point | |
| 16 | Environment | |
| 17 | Land clearance and resettlement | |
| | Total | 17 |

Source: DPI Ha Giang

c. Loan Implementation Consultant

43. The LIC for the Ha Giang PMU include procurement, financial and safeguard support. The LIC will be funded through counterpart funds. All detailed designs and construction are linked to the respective subprojects and will be funded by counterpart funds.

Table 10: Indicative LIC

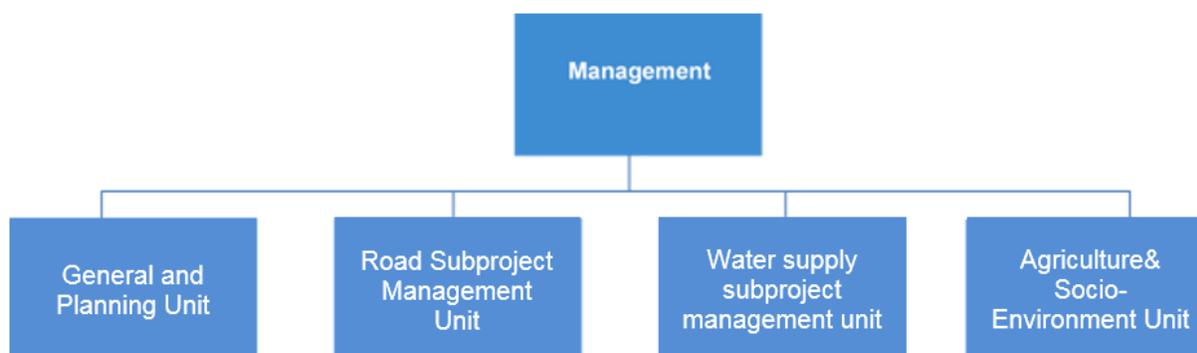
| Position | Person Month | Comment |
|----------------------------------|--------------|-------------------------|
| A. Infrastructure Engineer | 40 | Advance action required |
| B. Procurement Specialist | 36 | Advance action |
| C. Financial Accountant – Senior | 60 | Donor experience, |
| D. Safeguards – Social | 10 | Donor experience, |
| E. Safeguard – Environment | 24 | Donor experience, |
| F. Gender | 6 | Donor experience |

Source: Asian Development Bank estimates

4. Lang Son Project Management Unit

a. PMU Structure

Figure 5: Lang Son PMU Structure



b. PMU Staffing

44. A total staffing of 16 is proposed – see table 11. Lang Son PMU will be staffed with 16 full time positions based in Lang Son City. The Project Director and Deputy Director will be concurrent positions from DPI with the Project Director being at least a Deputy Director. Other positions to be filled with concurrent roles from DPI staff include the chief accountant and the safeguards position both of which will be full time project assignments.

Table 11: Indicative Staffing of Lang Son PMU

| No | Position | Number | Comment |
|------------|---|-----------|-------------|
| I | Management | 2 | |
| 1 | Director | | Concurrent |
| 2 | Deputy Director | | Concurrent |
| II | General and Planning Unit | 4 | |
| | Head of department - General & planning staff - Finance and disbursement staff - Reporting staff | | Concurrent |
| III | Road subproject management unit | 4 | |
| | - Head of Unit | | Concurrent |
| | 3 civil works staff | | Specialized |
| IV | Water supply subproject management unit | 2 | |
| | Head of unit | | Concurrent |
| | General management staff | | Specialized |
| V | Agriculture and Socio-environment unit | 4 | |
| | Head of unit | | Concurrent |
| | ARVC subproject management staff | | Specialized |
| | Environment staff | | Specialized |
| | Social safeguards/gender staff | | Concurrent |
| | PMU Total | 16 | |
| VI | BIIG1 Coordination Unit | | |
| | Coordinator | 1 | |
| | Support | 2 | |

c. Project Coordination Unit Costs

45. The Coordination Unit will be managed by an overall coordinator with the support of 2 support staff for five years with the appointment and formation of the unit seen as an advance action required to ensure early start up for work planning and project administration systems. A minimum of 1 staff position will have English capability for writing and reporting of Project reports and communication. Cost will be shared among participating provinces.

Table 12: Indicative BIIG1 Coordination Unit Costs

| | Totals Including Contingencies (US\$ '000) | | | | | | Total |
|--|--|------|------|------|------|------|-------|
| | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | |
| I. Investment Costs | | | | | | | |
| B. BIIG1 Coordination secretariat | | | | | | | |
| 1. Staff Costs | | | | | | | |
| Coordinator | 2.2 | 2.2 | 2.3 | 2.3 | 2.3 | 2.4 | 13.7 |
| Support team (n= 2) | 3.8 | 3.9 | 4.0 | 4.0 | 4.1 | 4.1 | 23.9 |
| Subtotal | 6.0 | 6.1 | 6.2 | 6.3 | 6.4 | 6.5 | 37.6 |
| 2. Operational Costs | | | | | | | |
| Per diems | 12.1 | 12.3 | 12.4 | 12.6 | 12.8 | 13.0 | 75.3 |
| Transport | 6.3 | 6.4 | 6.5 | 6.6 | 6.7 | 6.8 | 39.2 |
| Reports and office costs | 2.4 | 2.5 | 2.5 | 2.5 | 2.6 | 2.6 | 15.1 |
| Subtotal | 20.8 | 21.1 | 21.4 | 21.7 | 22.1 | 22.4 | 129.5 |
| Subtotal | 26.8 | 27.2 | 27.6 | 28.1 | 28.5 | 28.9 | 167.1 |

Source: Asian Development Bank estimates

d. Loan Implementation Consultant

46. The LIC for the Lang Son PMU include procurement, financial and safeguard support. The LIC will be funded through counterpart funds. All detailed designs, construction will be funded through an additional contract using counterpart funds.

Table 13: Indicative Loan Implementation Consultants

| Position | Person Month | Comment |
|----------------------------------|--------------|-------------------------|
| A. Infrastructure Engineer | 50 | Advance action required |
| B. Procurement Specialist | 42 | Advance action |
| C. Financial Accountant – Senior | 72 | Donor experience, |
| D. Safeguards – Social | 11 | Donor experience |
| E. Safeguard – Environment | 25 | Donor experience |
| F. Gender | 6 | Donor experience |

Source: Asian Development Bank estimates

IV. COSTS AND FINANCING

47. The project is estimated to cost \$ 190.3 million (Table 14).

Table 14: Summary Cost Estimates
(\$ million)

| Item | Amount ^a |
|--|---------------------|
| A. Base Cost^b | |
| 1. Road Network Connectivity Improved | 122.6 |
| 2. Rural Water Supply Improved | 19.5 |
| 3. ARVC Infrastructure in Lang Son Province Improved | 15.6 |
| 4. Decentralized Public Asset Management Processes Established | 2.0 |
| 5. Project Management | 5.2 |
| Subtotal (A) | 164.9 |
| B. Contingencies^c | 21.7 |
| C. Financial Charges During Implementation^d | 3.7 |
| Total (A+B+C) | 190.3 |

ARVC = agriculture and rural value chain.

^a The Government of Viet Nam will finance taxes and duties amounting to \$16.1 million.

^b In 2017 (March) prices, exchange rate as of 16 January 2017.

^c Physical contingencies computed at 10% for civil works; and equipment 10% and 0% for consulting services. Price contingencies computed at average of 1.5% on foreign exchange costs and 5% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

^d Interest during project implementation for the concessional ordinary capital resources loan has been computed at the rate of 2.0% p.a.

Source: ADB

48. The government has requested a concessional loan of \$150 million from ADB's concessional ordinary capital resources to help finance the project. The ADB loans will finance infrastructure development including road works, water supply construction, strengthening Lang Son ARVC, detailed engineering design⁷, construction supervision, and independent audit.

49. The government shall (i) make a portion of the loan proceeds available to the NEPs through budget allocation, and (ii) relend the balance of the proceeds of the Loan to the NEPs under the respective onlending agreements, all upon terms and conditions satisfactory to ADB.

50. The government will fund \$40.3 million to assist implementation, including project management, land acquisition and resettlement costs, loan implementation consulting services, and taxes and duties.

51. The summary financing plan is in Table 15.

Table 15: Summary Financing Plan

| Source | Amount (\$ million) | Share of Total (%) |
|--|------------------------|-----------------------|
| Asian Development Bank | | |
| Ordinary Capital Resources (concessional loan) | 150.0 | 79 |
| Government | 40.3 | 21 |
| Total | 190.3 | 100.0 |

Source: Asian Development Bank.

⁷ Except for road representative subproject in Ha Giang and all subprojects in Lang Son which will be financed by counterpart fund.

52. The provincial allocation of the project costs is presented in Table 16 below. The differences reflect the differing mixes of subprojects, the likelihood of land acquisition and compensation and the additional ARVC output in Lang Son Province.

Table 16: Provincial Financing Plan (US\$)

| | Bac Kan | Cao Bang | Ha Giang | Lang Son | Total |
|--------------|---------|----------|----------|----------|-------|
| ADB | 33.75 | 33.75 | 33.75 | 48.75 | 150 |
| GOV | 8.66 | 9.92 | 9.12 | 12.64 | 40.3 |
| Total | 42.41 | 43.67 | 42.87 | 61.39 | 190.3 |

B. Cost Estimates Preparation and Revisions

53. The cost estimates were prepared by the PPTA consultants based on the estimated bill of quantities for the representative subprojects, and applying provincial cost norms. Other costs were derived from field and institutional consultations during the PPTA.

C. Key Assumptions

54. The following key assumptions underpin the cost estimates and financing plan:

- (i) Exchange rate: Đ 22,350 = \$1 (as of 16 January 2017)
- (ii) Price contingencies over the implementation period are as follows:

Table 17: Price Escalation estimates

| Item | 2018 | 2019 | 2020 | 2021 | 2022 | Average |
|----------------------------------|------|------|------|------|------|---------|
| Foreign rate of price inflation | 1.5% | 1.5% | 1.5% | 1.5% | 1.5% | 1.5% |
| Domestic rate of price inflation | 5% | 5% | 5% | 5% | 5% | 5% |

Source(s): PPTA Final Report based on ADB VRM Guidance

55. A summary of the project resources by financier is in Table 18.

Table 18: Summary Financing Plan by Financier

| Component | Financier | |
|---|-----------|------------|
| | ADB | Government |
| Output 1 | | |
| Roads Bridges Associated Works | | |
| Detailed Design* | | |
| Construction Supervision Consultants | | |
| Land Acquisition | | |
| Value Added Taxes and Duties | | |
| Output 2 | | |
| Water Supply Infrastructure | | |
| Equipment | | |
| Detailed Design* | | |
| Construction Supervision | | |
| Land Acquisition | | |
| Value Added Taxes and Duties | | |
| Output 3 | | |
| Institutional Support | | |
| Grants / Block grants | | |
| Service Provider | | |
| Value Added Taxes and Duties | | |
| Output 4 | | |
| Equipment Purchase and Installation | | |
| Project Management | | |
| Project Management Unit staff and operating | | |
| Equipment | | |
| Vehicles | | |
| Project LIC | | |
| Audit of Project Financial Accounts | | |

* Government will finance DED for road representative subproject in Ha Giang province and all subprojects in Lang Son province. Detailed engineering designs financed by ADB includes the costs associated with shop drawings design, drawings verification, construction works cost estimate verification, and bidding documents preparation.

D. Detailed Cost Estimates by Expenditure Category

Table 19: Detailed Costs by Expenditure Category – Overall

| Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project Expenditure Accounts Project Cost Summary | (VND Million) | | | (US\$ '000) | | | % Total Base Costs |
|--|------------------|------------------|------------------|----------------|---------------|----------------|--------------------------|
| | Local | Foreign | Total | Local | Foreign | Total | |
| I. Investment Costs | | | | | | | |
| A. Civil Works | | | | | | | |
| 1. Roads and Bridges | 1,608,747 | 689,463 | 2,298,209 | 70,241 | 30,103 | 100,344 | 61 |
| 2. Water Supply | 274,921 | 117,823 | 392,744 | 12,004 | 5,144 | 17,148 | 10 |
| Subtotal | 1,883,668 | 807,286 | 2,690,954 | 82,245 | 35,248 | 117,493 | 71 |
| C. Land Acquisition | 250,018 | - | 250,018 | 10,917 | - | 10,917 | 7 |
| D. Subproject Others | 136,204 | - | 136,204 | 5,960 | - | 5,960 | 4 |
| E. Road Safety Awareness | 2,345 | 1,005 | 3,350 | 105 | 45 | 150 | - |
| F. HortLangSon_Operation | 23,580 | 653 | 24,233 | 1,030 | 29 | 1,058 | 1 |
| H. Value Chain Grants | 238,939 | 12,576 | 251,515 | 10,651 | 561 | 11,212 | 7 |
| I. Asset Management Systems | 25,920 | 18,780 | 44,700 | 1,160 | 840 | 2,000 | 1 |
| J. Consulting Services | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | 28,401 | 9,467 | 37,868 | 1,240 | 413 | 1,653 | 1 |
| 2. Design contracts | 114,267 | - | 114,267 | 5,010 | - | 5,010 | 3 |
| 3. Construction Supervision contracts | 67,247 | - | 67,247 | 2,936 | - | 2,936 | 2 |
| 4. HortLangSon_ServiceProvider | 55,726 | 10,433 | 66,158 | 2,433 | 456 | 2,889 | 2 |
| 5. Audit | 3,493 | 1,164 | 4,658 | 153 | 51 | 203 | - |
| Subtotal | 269,134 | 21,064 | 290,198 | 11,772 | 920 | 12,692 | 8 |
| K. Project Management | | | | | | | |
| 1. Staff Costs | 29,519 | - | 29,519 | 1,289 | - | 1,289 | 1 |
| 2. Office Equipment | 3,270 | 363 | 3,633 | 143 | 16 | 159 | - |
| 3. Office and Refurbishment costs | 912 | - | 912 | 40 | - | 40 | - |
| 4. Operating Costs | 10,394 | 1,834 | 12,228 | 454 | 80 | 534 | - |
| 5. GAP Implementation | 1,760 | 311 | 2,070 | 77 | 14 | 90 | - |
| 6. EMP Implementation | 3,748 | 661 | 4,409 | 164 | 29 | 193 | - |
| Subtotal | 49,601 | 3,169 | 52,770 | 2,166 | 138 | 2,304 | 1 |
| L. Project Preparation Costs | 24,632 | - | 24,632 | 1,075 | - | 1,075 | 1 |
| Total Investment Costs | 2,904,041 | 864,533 | 3,768,574 | 127,080 | 37,780 | 164,860 | 100 |
| II. Recurrent Costs | | | | | | | |
| Total BASELINE COSTS | 2,904,041 | 864,533 | 3,768,574 | 127,080 | 37,780 | 164,860 | 100 |
| Physical Contingencies | 205,164 | 80,692 | 285,856 | 8,958 | 3,523 | 12,481 | 8 |
| Price Contingencies | 546,773 | 192,810 | 739,584 | 6,860 | 2,409 | 9,269 | 6 |
| Total PROJECT COSTS | 3,655,978 | 1,138,036 | 4,794,014 | 142,898 | 43,713 | 186,611 | 113 |
| Interest During Implementation | - | 93,852 | 93,852 | - | 3,727 | 3,727 | 2 |
| Total Costs to be Financed | 3,655,978 | 1,231,888 | 4,887,866 | 142,898 | 47,439 | 190,337 | 115 |

Source: Asian Development Bank estimates

Table 20: Detailed Costs by Expenditure Category – Bac Kan Province

| Expenditure Accounts Project Cost Summary | | | | | | | % Total Base Costs |
|---|----------------|----------------|------------------|---------------|---------------|---------------|--------------------------|
| Bac Kan PPC | | | | | | | |
| (VND Million) | | | (US\$ '000) | | | | |
| Local | Foreign | Total | Local | Foreign | Total | | |
| I. Investment Costs | | | | | | | |
| A. Civil Works | | | | | | | |
| 1. Roads and Bridges | 394,187 | 168,937 | 563,125 | 17,211 | 7,376 | 24,587 | 67 |
| 2. Water Supply | 69,047 | 29,591 | 98,638 | 3,015 | 1,292 | 4,307 | 12 |
| Subtotal | 463,234 | 198,529 | 661,763 | 20,226 | 8,668 | 28,894 | 79 |
| C. Land Acquisition | 40,693 | - | 40,693 | 1,777 | - | 1,777 | 5 |
| D. Subproject Others | 26,326 | - | 26,326 | 1,149 | - | 1,149 | 3 |
| E. Road Safety Awareness | 1,173 | 503 | 1,675 | 52 | 22 | 75 | - |
| I. Asset Management Systems | 6,480 | 4,695 | 11,175 | 290 | 210 | 500 | 1 |
| J. Consulting Services | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | 6,608 | 2,203 | 8,811 | 289 | 96 | 385 | 1 |
| 2. Design contracts | 35,347 | - | 35,347 | 1,545 | - | 1,545 | 4 |
| 3. Construction Supervision contracts | 16,610 | - | 16,610 | 725 | - | 725 | 2 |
| 5. Audit | 873 | 291 | 1,164 | 38 | 13 | 51 | - |
| Subtotal | 59,438 | 2,494 | 61,932 | 2,596 | 109 | 2,705 | 7 |
| K. Project Management | | | | | | | |
| 1. Staff Costs | 7,821 | - | 7,821 | 341 | - | 341 | 1 |
| 2. Office Equipment | 475 | 53 | 528 | 21 | 2 | 23 | - |
| 3. Office and Refurbishment costs | 248 | - | 248 | 11 | - | 11 | - |
| 4. Operating Costs | 2,452 | 433 | 2,885 | 107 | 19 | 126 | - |
| 5. GAP Implementation | 581 | 102 | 683 | 25 | 4 | 30 | - |
| 6. EMP Implementation | 880 | 155 | 1,035 | 38 | 7 | 45 | - |
| Subtotal | 12,456 | 743 | 13,200 | 544 | 32 | 576 | 2 |
| L. Project Preparation Costs | 17,636 | - | 17,636 | 770 | - | 770 | 2 |
| Total Investment Costs | 627,436 | 206,963 | 834,399 | 27,405 | 9,042 | 36,447 | 100 |
| II. Recurrent Costs | | | | | | | |
| Total BASELINE COSTS | | | | | | | |
| Physical Contingencies | 47,675 | 19,820 | 67,495 | 2,082 | 865 | 2,947 | 8 |
| Price Contingencies | 126,065 | 45,334 | 171,399 | 1,582 | 567 | 2,149 | 6 |
| Total PROJECT COSTS | 801,176 | 272,118 | 1,073,293 | 31,068 | 10,474 | 41,543 | 114 |
| Interest During Implementation | - | 21,937 | 21,937 | - | 866 | 866 | 2 |
| Total Costs to be Financed | 801,176 | 294,055 | 1,095,230 | 31,068 | 11,340 | 42,408 | 116 |

Source: Asian Development Bank estimates

Table 21: Detailed Costs by Expenditure Category – Cao Bang Province

| Expenditure Accounts Project Cost Summary | | | | | | | % Total Base Costs |
|---|----------------|----------------|------------------|---------------|---------------|---------------|--------------------------|
| (VND Million) | | | (US\$ '000) | | | | |
| Local | Foreign | Total | Local | Foreign | Total | | |
| Cao Bang PPC | | | | | | | |
| I. Investment Costs | | | | | | | |
| A. Civil Works | | | | | | | |
| 1. Roads and Bridges | 407,438 | 174,616 | 582,054 | 17,790 | 7,624 | 25,414 | 69 |
| 2. Water Supply | 61,163 | 26,213 | 87,376 | 2,671 | 1,145 | 3,815 | 10 |
| Subtotal | 468,601 | 200,829 | 669,430 | 20,460 | 8,769 | 29,229 | 79 |
| C. Land Acquisition | 69,618 | - | 69,618 | 3,040 | - | 3,040 | 8 |
| D. Subproject Others | 35,455 | - | 35,455 | 1,550 | - | 1,550 | 4 |
| I. Asset Management Systems | 6,480 | 4,695 | 11,175 | 290 | 210 | 500 | 1 |
| J. Consulting Services | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | 5,373 | 1,791 | 7,164 | 235 | 78 | 313 | 1 |
| 2. Design contracts | 25,297 | - | 25,297 | 1,107 | - | 1,107 | 3 |
| 3. Construction Supervision contracts | 17,823 | - | 17,823 | 778 | - | 778 | 2 |
| 5. Audit | 873 | 291 | 1,164 | 38 | 13 | 51 | - |
| Subtotal | 49,366 | 2,082 | 51,448 | 2,158 | 91 | 2,249 | 6 |
| K. Project Management | | | | | | | |
| 1. Staff Costs | 7,647 | - | 7,647 | 334 | - | 334 | 1 |
| 3. Office and Refurbishment costs | 336 | - | 336 | 15 | - | 15 | - |
| 4. Operating Costs | 2,131 | 376 | 2,507 | 93 | 16 | 109 | - |
| 5. GAP Implementation | 282 | 50 | 331 | 12 | 2 | 14 | - |
| 6. EMP Implementation | 704 | 124 | 828 | 31 | 5 | 36 | - |
| Subtotal | 11,100 | 550 | 11,650 | 485 | 24 | 509 | 1 |
| Total Investment Costs | 640,620 | 208,156 | 848,776 | 27,983 | 9,094 | 37,077 | 100 |
| II. Recurrent Costs | | | | | | | |
| Total BASELINE COSTS | 640,620 | 208,156 | 848,776 | 27,983 | 9,094 | 37,077 | 100 |
| Physical Contingencies | 61,307 | 20,079 | 81,386 | 2,677 | 877 | 3,553 | 10 |
| Price Contingencies | 137,106 | 48,861 | 185,967 | 1,718 | 610 | 2,327 | 6 |
| Total PROJECT COSTS | 839,032 | 277,097 | 1,116,129 | 32,377 | 10,580 | 42,957 | 116 |
| Interest During Implementation | - | 18,270 | 18,270 | - | 711 | 711 | 2 |
| Total Costs to be Financed | 839,032 | 295,366 | 1,134,398 | 32,377 | 11,290 | 43,668 | 118 |

Source: Asian Development Bank estimates

Table 22: Detailed Costs by Expenditure Category – Ha Giang Province

| Expenditure Accounts Project Cost Summary Ha Giang PPC | (VND Million) | | | (US\$ '000) | | | % Total Base Costs |
|---|----------------|----------------|------------------|---------------|---------------|---------------|--------------------------|
| | Local | Foreign | Total | Local | Foreign | Total | |
| I. Investment Costs | | | | | | | |
| A. Civil Works | | | | | | | |
| 1. Roads and Bridges | 400,360 | 171,583 | 571,943 | 17,481 | 7,492 | 24,972 | 68 |
| 2. Water Supply | 73,711 | 31,590 | 105,301 | 3,218 | 1,379 | 4,598 | 12 |
| Subtotal | 474,071 | 203,173 | 677,244 | 20,699 | 8,871 | 29,570 | 80 |
| C. Land Acquisition | 61,771 | - | 61,771 | 2,697 | - | 2,697 | 7 |
| D. Subproject Others | 22,575 | - | 22,575 | 986 | - | 986 | 3 |
| E. Road Safety Awareness | 1,173 | 503 | 1,675 | 52 | 22 | 75 | - |
| I. Asset Management Systems | 6,480 | 4,695 | 11,175 | 290 | 210 | 500 | 1 |
| J. Consulting Services | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | 8,730 | 2,910 | 11,640 | 381 | 127 | 508 | 1 |
| 2. Design contracts | 30,336 | - | 30,336 | 1,342 | - | 1,342 | 4 |
| 3. Construction Supervision contracts | 14,909 | - | 14,909 | 651 | - | 651 | 2 |
| 5. Audit | 873 | 291 | 1,164 | 38 | 13 | 51 | - |
| Subtotal | 54,848 | 3,201 | 58,049 | 2,412 | 140 | 2,552 | 7 |
| K. Project Management | | | | | | | |
| 1. Staff Costs | 8,729 | - | 8,729 | 381 | - | 381 | 1 |
| 3. Office and Refurbishment costs | 327 | - | 327 | 14 | - | 14 | - |
| 4. Operating Costs | 673 | 119 | 792 | 29 | 5 | 35 | - |
| 5. GAP Implementation | 669 | 118 | 787 | 29 | 5 | 34 | - |
| 6. EMP Implementation | 1,408 | 248 | 1,656 | 61 | 11 | 72 | - |
| Subtotal | 11,805 | 485 | 12,290 | 515 | 21 | 537 | 1 |
| Total Investment Costs | 632,723 | 212,057 | 844,780 | 27,651 | 9,264 | 36,916 | 100 |
| II. Recurrent Costs | | | | | | | |
| Total BASELINE COSTS | 632,723 | 212,057 | 844,780 | 27,651 | 9,264 | 36,916 | 100 |
| Physical Contingencies | 47,407 | 20,317 | 67,724 | 2,070 | 887 | 2,957 | 8 |
| Price Contingencies | 131,534 | 48,565 | 180,099 | 1,647 | 607 | 2,254 | 6 |
| Total PROJECT COSTS | 811,664 | 280,939 | 1,092,604 | 31,369 | 10,758 | 42,127 | 114 |
| Interest During Implementation | - | 19,059 | 19,059 | - | 744 | 744 | 2 |
| Total Costs to be Financed | 811,664 | 299,999 | 1,111,663 | 31,369 | 11,502 | 42,871 | 116 |

Source: Asian Development Bank estimates

Table 23: Detailed Costs by Expenditure Category – Lang Son province

| Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project | | | | | | | |
|--|------------------|----------------|------------------|---------------|---------------|---------------|--------------------|
| Expenditure Accounts Project Cost Summary | | | | | | | |
| Lang Son PPC | | | | | | | |
| | (VND Million) | | | (US\$ '000) | | | % Total Base Costs |
| | Local | Foreign | Total | Local | Foreign | Total | |
| I. Investment Costs | | | | | | | |
| A. Civil Works | | | | | | | |
| 1. Roads and Bridges | 406,761 | 174,326 | 581,087 | 17,760 | 7,611 | 25,371 | 47 |
| 2. Water Supply | 71,001 | 30,429 | 101,430 | 3,100 | 1,329 | 4,429 | 8 |
| Subtotal | 477,762 | 204,755 | 682,517 | 20,860 | 8,940 | 29,800 | 55 |
| C. Land Acquisition | 77,936 | - | 77,936 | 3,403 | - | 3,403 | 6 |
| D. Subproject Others | 51,848 | - | 51,848 | 2,275 | - | 2,275 | 4 |
| F. HortLangSon_Operation | 23,580 | 653 | 24,233 | 1,030 | 29 | 1,058 | 2 |
| H. Value Chain Grants | 238,939 | 12,576 | 251,515 | 10,651 | 561 | 11,212 | 21 |
| I. Asset Management Systems | 6,480 | 4,695 | 11,175 | 290 | 210 | 500 | 1 |
| J. Consulting Services | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | 7,690 | 2,563 | 10,253 | 336 | 112 | 448 | 1 |
| 2. Design contracts | 23,288 | - | 23,288 | 1,017 | - | 1,017 | 2 |
| 3. Construction Supervision contracts | 17,906 | - | 17,906 | 782 | - | 782 | 1 |
| 4. HortLangSon_ServiceProvider | 55,726 | 10,433 | 66,158 | 2,433 | 456 | 2,889 | 5 |
| 5. Audit | 873 | 291 | 1,164 | 38 | 13 | 51 | - |
| Subtotal | 105,482 | 13,287 | 118,769 | 4,606 | 580 | 5,186 | 10 |
| K. Project Management | | | | | | | |
| 1. Staff Costs | 5,322 | - | 5,322 | 232 | - | 232 | - |
| 2. Office Equipment | 2,795 | 311 | 3,105 | 122 | 14 | 136 | - |
| 4. Operating Costs | 5,138 | 907 | 6,044 | 224 | 40 | 264 | - |
| 5. GAP Implementation | 229 | 40 | 269 | 10 | 2 | 12 | - |
| 6. EMP Implementation | 757 | 134 | 890 | 33 | 6 | 39 | - |
| Subtotal | 14,240 | 1,391 | 15,631 | 622 | 61 | 682 | 1 |
| L. Project Preparation Costs | 6,996 | - | 6,996 | 305 | - | 305 | 1 |
| Total Investment Costs | 1,003,262 | 237,357 | 1,240,619 | 44,041 | 10,380 | 54,421 | 100 |
| II. Recurrent Costs | | | | | | | |
| Total BASELINE COSTS | 1,003,262 | 237,357 | 1,240,619 | 44,041 | 10,380 | 54,421 | 100 |
| Physical Contingencies | 48,775 | 20,476 | 69,250 | 2,130 | 894 | 3,024 | 6 |
| Price Contingencies | 152,068 | 50,050 | 202,118 | 1,913 | 627 | 2,539 | 5 |
| Total PROJECT COSTS | 1,204,105 | 307,882 | 1,511,987 | 48,083 | 11,901 | 59,984 | 110 |
| Interest During Implementation | - | 34,587 | 34,587 | - | 1,406 | 1,406 | 3 |
| Total Costs to be Financed | 1,204,105 | 342,469 | 1,546,574 | 48,083 | 13,307 | 61,390 | 113 |

Source: Asian Development Bank estimates

E. Allocation and Withdrawal of Loan Proceeds

Table 24: Concessional Ordinary Lending

| No. | Item | Total Amount Allocated for ADB Financing (\$) | | Percentage and Basis for Withdrawal from the Loan Account |
|-----|--|---|-------------|---|
| | | Category | Subcategory | |
| 1 | Project cost | 144,686,400 | | 100% of total expenditure claimed** |
| 1A | for Bac Kan Province* | | 32,884,373 | 100% of total expenditure claimed** |
| 1B | for Cao Bang Province* | | 33,039,415 | 100 percent of total expenditure claimed** |
| 1C | for Ha Giang Province* | | 31,418,624 | 100% of total expenditure claimed*** |
| 1D | for Lang Son Province* | | 47,343,988 | 100% of total expenditure claimed**** |
| 2 | Consulting Services for Ha Giang Province* | 1,587,004 | | 66 % of total expenditure claimed***** |
| 3 | Interest Charges | 3,726,596 | | 100% of amounts due |
| | Total | 150,000,000 | | |

* Subject to the condition for withdrawal described in paragraph 6, Schedule 3 of the Loan Agreement (Ordinary Operations [Concessional])

** Exclusive of taxes and duties imposed within the territory of the Borrower, and loan implementation consulting services

*** Exclusive of taxes and duties imposed within the territory of the Borrower.

**** Exclusive of taxes and duties imposed within the territory of the Borrower, and loan implementation consulting services and detailed engineering design consulting services.

***** Exclusive of loan implementation consulting services.

F. Detailed Cost Estimates by Financier

Table 25: Expenditure Category by Financier – Overall

| Expenditure Accounts by Financiers (US\$ '000) | The Government | | | | | | | | | | | | | |
|---|----------------|-----|-------------|----|--------------|----|--------------|----|--------------|----|---------------|---|---------|-----|
| | ADB COL | | Bac Kan PPC | | Cao Bang PPC | | HA Giang PPC | | Lang Son PPC | | CF Funded VAT | | Total | |
| | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % |
| I. Investment Costs | | | | | | | | | | | | | | |
| A. Civil Works | | | | | | | | | | | | | | |
| 1. Roads and Bridges | 106,570 | 91 | - | - | - | - | - | - | - | - | 10,540 | 9 | 117,110 | 62 |
| 2. Water Supply | 18,201 | 91 | - | - | - | - | - | - | - | - | 1,800 | 9 | 20,001 | 11 |
| Subtotal | 124,771 | 91 | - | - | - | - | - | - | - | - | 12,340 | 9 | 137,111 | 72 |
| C. Land Acquisition | - | - | 1,836 | 16 | 3,258 | 28 | 2,548 | 22 | 3,193 | 27 | 890 | 8 | 11,725 | 6 |
| D. Subproject Others | - | - | 1,104 | 18 | 1,562 | 25 | 940 | 15 | 2,176 | 35 | 531 | 8 | 6,312 | 3 |
| E. Road Safety Awareness | - | - | 68 | 46 | - | - | 68 | 46 | - | - | 13 | 9 | 150 | 0 |
| F. HortLangSon_Operation | 1,005 | 91 | - | - | - | - | - | - | - | - | 99 | 9 | 1,104 | 1 |
| H. Value Chain Grants | 11,132 | 99 | - | - | - | - | - | - | - | - | 159 | 1 | 11,290 | 6 |
| I. Asset Management Systems | - | - | 455 | 23 | 455 | 23 | 455 | 23 | 455 | 23 | 180 | 9 | 2,000 | 1 |
| J. Consulting Services | | | | | | | | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | - | - | 365 | 21 | 298 | 17 | 482 | 28 | 424 | 25 | 155 | 9 | 1,724 | 1 |
| 2. Design contracts | 3,501 | 67 | - | - | - | - | 327 | 6 | 950 | 18 | 468 | 9 | 5,246 | 3 |
| 3. Construction Supervision contracts | 2,948 | 91 | - | - | - | - | - | - | - | - | 292 | 9 | 3,240 | 2 |
| 4. HortLangSon_ServiceProvider | 2,724 | 91 | - | - | - | - | - | - | - | - | 269 | 9 | 2,994 | 2 |
| 5. Audit | 193 | 91 | - | - | - | - | - | - | - | - | 19 | 9 | 212 | 0 |
| Subtotal | 9,366 | 70 | 365 | 3 | 298 | 2 | 809 | 6 | 1,374 | 10 | 1,203 | 9 | 13,415 | 7 |
| K. Project Management | | | | | | | | | | | | | | |
| 1. Staff Costs | - | - | 347 | 26 | 348 | 26 | 398 | 30 | 232 | 17 | 20 | 2 | 1,345 | 1 |
| 2. Office Equipment | - | - | 21 | 13 | - | - | - | - | 125 | 78 | 14 | 9 | 161 | 0 |
| 3. Office and Refurbishment costs | - | - | 10 | 25 | 14 | 34 | 13 | 33 | - | - | 4 | 9 | 40 | - |
| 4. Operating Costs | - | - | 119 | 21 | 104 | 19 | 33 | 6 | 251 | 45 | 50 | 9 | 557 | 0 |
| 5. GAP Implementation | - | - | 29 | 30 | 14 | 15 | 33 | 35 | 11 | 12 | 9 | 9 | 95 | - |
| 6. EMP Implementation | - | - | 43 | 21 | 35 | 17 | 69 | 34 | 37 | 18 | 18 | 9 | 202 | 0 |
| Subtotal | - | - | 569 | 24 | 514 | 21 | 546 | 23 | 656 | 27 | 115 | 5 | 2,400 | 1 |
| L. Project Preparation Costs | - | - | 720 | 65 | - | - | - | - | 284 | 26 | 99 | 9 | 1,103 | 1 |
| Total Investment Costs | 146,273 | 78 | 5,118 | 3 | 6,087 | 3 | 5,365 | 3 | 8,137 | 4 | 15,630 | 8 | 186,611 | 98 |
| II. Recurrent Costs | | | | | | | | | | | | | | |
| Total PROJECT COSTS | 146,273 | 78 | 5,118 | 3 | 6,087 | 3 | 5,365 | 3 | 8,137 | 4 | 15,630 | 8 | 186,611 | 98 |
| Interest During Implementation | 3,727 | 100 | - | - | - | - | - | - | - | - | - | - | 3,727 | 2 |
| Total Disbursement | 150,000 | 79 | 5,118 | 3 | 6,087 | 3 | 5,365 | 3 | 8,137 | 4 | 15,630 | 8 | 190,337 | 100 |

Source: Asian Development Bank estimates

Table 26: Expenditure Category by Financier – Bac Kan Province

| Expenditure Accounts by Financiers Bac Kan PPC (US\$ '000) | The Government | | | | | | | | |
|---|----------------|-----|-------------|-----|---------------|----|--------|-----|---|
| | ADB COL | | Bac Kan PPC | | CF Funded VAT | | Total | | |
| | Amount | % | Amount | % | Amount | % | Amount | % | |
| I. Investment Costs | | | | | | | | | |
| A. Civil Works | | | | | | | | | |
| 1. Roads and Bridges | 26,056 | 91 | - | - | 2,577 | 9 | 28,633 | 68 | |
| 2. Water Supply | 4,564 | 91 | - | - | 451 | 9 | 5,015 | 12 | |
| Subtotal | 30,619 | 91 | - | - | 3,028 | 9 | 33,648 | 79 | |
| C. Land Acquisition | - | - | 1,836 | 100 | - | - | 1,836 | 4 | |
| D. Subproject Others | - | - | 1,104 | 92 | 98 | 8 | 1,201 | 3 | |
| E. Road Safety Awareness | - | - | 68 | 91 | 7 | 9 | 75 | 0 | |
| I. Asset Management Systems | - | - | - | - | 455 | 91 | 45 | 500 | 1 |
| J. Consulting Services | | | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | - | - | 365 | 91 | 36 | 9 | 401 | 1 | |
| 2. Design contracts | 1,475 | 91 | - | - | 146 | 9 | 1,621 | 4 | |
| 3. Construction Supervision contracts | 741 | 91 | - | - | 73 | 9 | 815 | 2 | |
| 5. Audit | 48 | 91 | - | - | 5 | 9 | 53 | 0 | |
| Subtotal | 2,265 | 78 | 365 | 13 | 260 | 9 | 2,890 | 7 | |
| K. Project Management | | | | | | | | | |
| 1. Staff Costs | - | - | 347 | 97 | 10 | 3 | 356 | 1 | |
| 2. Office Equipment | - | - | 21 | 91 | 2 | 9 | 23 | 0 | |
| 3. Office and Refurbishment costs | - | - | 10 | 91 | 1 | 9 | 11 | - | |
| 4. Operating Costs | - | - | 119 | 91 | 12 | 9 | 131 | 0 | |
| 5. GAP Implementation | - | - | 29 | 91 | 3 | 9 | 31 | 0 | |
| 6. EMP Implementation | - | - | 43 | 91 | 4 | 9 | 47 | 0 | |
| Subtotal | - | - | 569 | 95 | 32 | 5 | 601 | 1 | |
| L. Project Preparation Costs | - | - | 720 | 91 | 71 | 9 | 791 | 2 | |
| Total Investment Costs | 32,884 | 79 | 5,118 | 12 | 3,541 | 9 | 41,543 | 98 | |
| II. Recurrent Costs | | | | | | | | | |
| Total PROJECT COSTS | 32,884 | 79 | 5,118 | 12 | 3,541 | 9 | 41,543 | 98 | |
| Interest During Implementation | 866 | 100 | - | - | - | - | 866 | 2 | |
| Total Disbursement | 33,750 | 80 | 5,118 | 12 | 3,541 | 8 | 42,408 | 100 | |

Source: Asian Development Bank estimates

Table 27: Expenditure Category by Financier – Cao Bang Province

| Expenditure Accounts by Financiers Cao Bang PPC (US\$ '000) | The Government | | | | | | | |
|--|----------------|-----|--------------|-----|---------------|---|--------|-----|
| | ADB COL | | Cao Bang PPC | | CF_Funded VAT | | Total | |
| | Amount | % | Amount | % | Amount | % | Amount | % |
| I. Investment Costs | | | | | | | | |
| A. Civil Works | | | | | | | | |
| 1. Roads and Bridges | 27,043 | 91 | - | - | 2,675 | 9 | 29,717 | 68 |
| 2. Water Supply | 4,048 | 91 | - | - | 400 | 9 | 4,448 | 10 |
| Subtotal | 31,090 | 91 | - | - | 3,075 | 9 | 34,165 | 78 |
| C. Land Acquisition | - | - | 3,258 | 91 | 322 | 9 | 3,580 | 8 |
| D. Subproject Others | - | - | 1,562 | 91 | 154 | 9 | 1,716 | 4 |
| I. Asset Management Systems | - | - | 455 | 91 | 45 | 9 | 500 | 1 |
| J. Consulting Services | | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | - | - | 298 | 91 | 29 | 9 | 327 | 1 |
| 2. Design contracts | 1,116 | 91 | - | - | 106 | 9 | 1,222 | 3 |
| 3. Construction Supervision contracts | 785 | 91 | - | - | 78 | 9 | 863 | 2 |
| 5. Audit | 48 | 91 | - | - | 5 | 9 | 53 | 0 |
| Subtotal | 1,949 | 79 | 298 | 12 | 218 | 9 | 2,465 | 6 |
| K. Project Management | | | | | | | | |
| 1. Staff Costs | - | - | 348 | 100 | - | - | 348 | 1 |
| 3. Office and Refurbishment costs | - | - | 14 | 91 | 1 | 9 | 15 | - |
| 4. Operating Costs | - | - | 104 | 91 | 10 | 9 | 114 | 0 |
| 5. GAP Implementation | - | - | 14 | 91 | 1 | 9 | 15 | - |
| 6. EMP Implementation | - | - | 35 | 91 | 3 | 9 | 38 | 0 |
| Subtotal | - | - | 514 | 97 | 16 | 3 | 531 | 1 |
| Total Investment Costs | 33,039 | 77 | 6,087 | 14 | 3,831 | 9 | 42,957 | 98 |
| II. Recurrent Costs | | | | | | | | |
| Total PROJECT COSTS | 33,039 | 77 | 6,087 | 14 | 3,831 | 9 | 42,957 | 98 |
| Interest During Implementation | 711 | 100 | - | - | - | - | 711 | 2 |
| Total Disbursement | 33,750 | 77 | 6,087 | 14 | 3,831 | 9 | 43,668 | 100 |

Source: Asian Development Bank estimates

Table 28: Expenditure Category by Financier – Ha Giang Province

| Expenditure Accounts by Financiers Ha Giang PPC (US\$ '000) | The Government | | | | | | | |
|--|----------------|-----|--------------|-----|---------------|---|--------|-------|
| | ADB COL | | HA Giang PPC | | CF_Funded VAT | | Total | |
| | Amount | % | Amount | % | Amount | % | Amount | % |
| I. Investment Costs | | | | | | | | |
| A. Civil Works | | | | | | | | |
| 1. Roads and Bridges | 26,537 | 91 | - | - | 2,625 | 9 | 29,162 | 68.0 |
| 2. Water Supply | 4,881 | 91 | - | - | 483 | 9 | 5,364 | 12.5 |
| Subtotal | 31,419 | 91 | - | - | 3,107 | 9 | 34,526 | 80.5 |
| C. Land Acquisition | - | - | 2,548 | 91 | 252 | 9 | 2,800 | 6.5 |
| D. Subproject Others | - | - | 940 | 91 | 93 | 9 | 1,033 | 2.4 |
| E. Road Safety Awareness | - | - | 68 | 91 | 7 | 9 | 75 | 0.2 |
| I. Asset Management Systems | - | - | 455 | 91 | 45 | 9 | 500 | 1.2 |
| J. Consulting Services | | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | - | - | 482 | 91 | 48 | 9 | 529 | 1.2 |
| 2. Design contracts | 910 | 67 | 327 | 24 | 122 | 9 | 1,359 | 3.2 |
| 3. Construction Supervision contracts | 629 | 91 | - | - | 62 | 9 | 691 | 1.6 |
| 5. Audit | 48 | 91 | - | - | 5 | 9 | 53 | 0.1 |
| Subtotal | 1,587 | 60 | 809 | 31 | 237 | 9 | 2,632 | 6.1 |
| K. Project Management | | | | | | | | |
| 1. Staff Costs | - | - | 398 | 100 | - | - | 398 | 0.9 |
| 3. Office and Refurbishment costs | - | - | 13 | 91 | 1 | 9 | 14 | - |
| 4. Operating Costs | - | - | 33 | 91 | 3 | 9 | 36 | 0.1 |
| 5. GAP Implementation | - | - | 33 | 91 | 3 | 9 | 36 | 0.1 |
| 6. EMP Implementation | - | - | 69 | 91 | 7 | 9 | 76 | 0.2 |
| Subtotal | - | - | 546 | 97 | 15 | 3 | 560 | 1.3 |
| Total Investment Costs | 33,006 | 78 | 5,365 | 13 | 3,756 | 9 | 42,127 | 98.3 |
| II. Recurrent Costs | | | | | | | | |
| Total PROJECT COSTS | 33,006 | 78 | 5,365 | 13 | 3,756 | 9 | 42,127 | 98.3 |
| Interest During Implementation | 744 | 100 | - | - | - | - | 744 | 1.7 |
| Total Disbursement | 33,750 | 79 | 5,365 | 13 | 3,756 | 9 | 42,871 | 100.0 |

Source: Asian Development Bank estimates

Table 29: Expenditure Category by Financier – Lang Son Province

| Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project | | | | | | | | | | |
|--|---------------|-----------|--------------------|-----------|--------------|----------|---------------|------------|---------------|------------|
| Expenditure Accounts by Financiers | | | | | | | | | | |
| Lang Son PPC (US\$ '000) | | | | | | | | | | |
| ADB COL | Lang Son PPC | | Counterpart Funded | | | | Total | | | |
| | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % |
| I. Investment Costs | | | | | | | | | | |
| A. Civil Works | | | | | | | | | | |
| 1. Roads and Bridges | 26,934 | 91 | - | - | 2,664 | 9 | 2,664 | 9 | 29,598 | 48 |
| 2. Water Supply | 4,708 | 91 | - | - | 466 | 9 | 466 | 9 | 5,174 | 8 |
| Subtotal | 31,642 | 91 | - | - | 3,129 | 9 | 3,129 | 9 | 34,772 | 57 |
| C. Land Acquisition | - | - | 3,193 | 91 | 316 | 9 | 3,509 | 100 | 3,509 | 6 |
| D. Subproject Others | - | - | 2,176 | 92 | 186 | 8 | 2,361 | 100 | 2,361 | 4 |
| F. HortLangSon_Operation | 1,005 | 91 | - | - | 99 | 9 | 99 | 9 | 1,104 | 2 |
| H. Value Chain Grants | 11,132 | 99 | - | - | 159 | 1 | 159 | 1 | 11,290 | 18 |
| I. Asset Management Systems | - | - | 455 | 91 | 45 | 9 | 500 | 100 | 500 | 1 |
| J. Consulting Services | | | | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | - | - | 424 | 91 | 42 | 9 | 466 | 100 | 466 | 1 |
| 2. Design contracts | - | - | 950 | 91 | 94 | 9 | 1,043 | 100 | 1,043 | 2 |
| 3. Construction Supervision contracts | 793 | 91 | - | - | 78 | 9 | 78 | 9 | 871 | 1 |
| 4. HortLangSon_ServiceProvider | 2,724 | 91 | - | - | 269 | 9 | 269 | 9 | 2,994 | 5 |
| 5. Audit | 48 | 91 | - | - | 5 | 9 | 5 | 9 | 53 | 0 |
| Subtotal | 3,565 | 66 | 1,374 | 25 | 488 | 9 | 1,862 | 34 | 5,427 | 9 |
| K. Project Management | | | | | | | | | | |
| 1. Staff Costs | - | - | 232 | 96 | 10 | 4 | 242 | 100 | 242 | 0 |
| 2. Office Equipment | - | - | 125 | 91 | 12 | 9 | 137 | 100 | 137 | 0 |
| 4. Operating Costs | - | - | 251 | 91 | 25 | 9 | 275 | 100 | 275 | 0 |
| 5. GAP Implementation | - | - | 11 | 91 | 1 | 9 | 12 | 100 | 12 | - |
| 6. EMP Implementation | - | - | 37 | 91 | 4 | 9 | 41 | 100 | 41 | 0 |
| Subtotal | - | - | 656 | 93 | 52 | 7 | 708 | 100 | 708 | 1 |
| L. Project Preparation Costs | - | - | 284 | 91 | 28 | 9 | 312 | 100 | 312 | 1 |
| Total Investment Costs | 47,344 | 79 | 8,137 | 14 | 4,503 | 8 | 12,640 | 21 | 59,984 | 98 |
| Interest During Implementation | 1,406 | 100 | - | - | - | - | - | - | 1,406 | 2 |
| Total Disbursement | 48,750 | 79 | 8,137 | 13 | 4,503 | 7 | 12,640 | 20 | 61,390 | 100 |

Source: Asian Development Bank estimates

G. Detailed Cost Estimates by Outputs and/or Components

Table 30: Cost Estimate by Output – Overall

| Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project Expenditure Accounts by Components - Totals Including Contingencies (US\$ '000) | | | | | | | | | | | |
|---|---|-----------------------|--|-----------------------|--|-----------------------|--|-----------------------|--------------------|-----------------------|---------|
| | Output 1: Road network connectivity improved | Share of Category (%) | Output 2: Rural water supply improved | Share of Category (%) | Output 3: ARVCs in Lang Son province improved | Share of Category (%) | Output 4: Decentralized public asset management processes established | Share of Category (%) | Project Management | Share of Category (%) | Total |
| I. Investment Costs | | | | | | | | | | | |
| A. Civil Works | | | | | | | | | | | |
| 1. Roads and Bridges | 117,110 | 100% | - | - | - | - | - | - | - | - | 117,110 |
| 2. Water Supply | - | - | 20,001 | 100% | - | - | - | - | - | - | 20,001 |
| Subtotal | 117,110 | 85% | 20,001 | 15% | - | - | - | - | - | - | 137,111 |
| C. Land Acquisition | 11,456 | 98% | 269 | 2% | - | - | - | - | - | - | 11,725 |
| D. Subproject Others | 5,325 | 84% | 552 | 9% | 435 | 7% | - | - | - | - | 6,312 |
| E. Road Safety Awareness | 150 | 100% | - | - | - | - | - | - | - | - | 150 |
| F. HortLangSon_Operation | - | - | - | - | 1,104 | 100% | - | - | - | - | 1,104 |
| H. Value Chain Grants | - | - | - | - | 11,290 | 100% | - | - | - | - | 11,290 |
| I. Asset Management Systems | - | - | - | - | - | - | 2,000 | 100% | - | - | 2,000 |
| J. Consulting Services | | | | | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | - | - | - | - | - | - | - | - | 1,724 | 100% | 1,724 |
| 2. Design contracts | 4,423 | 84% | 823 | 16% | - | - | - | - | - | - | 5,246 |
| 3. Construction Supervision contracts | 2,472 | 76% | 768 | 24% | - | - | - | - | - | - | 3,240 |
| 4. HortLangSon_ServiceProvider | - | - | - | - | 2,994 | 100% | - | - | - | - | 2,994 |
| 5. Audit | - | - | - | - | - | - | - | - | 212 | 100% | 212 |
| Subtotal | 6,895 | 51% | 1,591 | 12% | 2,994 | 22% | - | - | 1,936 | 14% | 13,415 |
| K. Project Management | | | | | | | | | | | |
| 1. Staff Costs | - | - | - | - | - | - | - | - | 1,345 | 100% | 1,345 |
| 2. Office Equipment | - | - | - | - | - | - | - | - | 161 | 100% | 161 |
| 3. Office and Refurbishment costs | - | - | - | - | - | - | - | - | 40 | 100% | 40 |
| 4. Operating Costs | - | - | - | - | - | - | - | - | 557 | 100% | 557 |
| 5. GAP Implementation | - | - | - | - | - | - | - | - | 95 | 100% | 95 |
| 6. EMP Implementation | - | - | - | - | - | - | - | - | 202 | 100% | 202 |
| Subtotal | - | - | - | - | - | - | - | - | 2,400 | 100% | 2,400 |
| L. Project Preparation Costs | - | - | - | - | - | - | - | - | 1,103 | 100% | 1,103 |
| Total Investment Costs | 140,936 | 76% | 22,413 | 12% | 15,824 | 8% | 2,000 | 1% | 5,439 | 3% | 186,611 |
| II. Recurrent Costs | | | | | | | | | | | |
| Total PROJECT COSTS | 140,936 | 76% | 22,413 | 12% | 15,824 | 8% | 2,000 | 1% | 5,439 | 3% | 186,611 |
| Interest During Implementation | - | - | - | - | - | - | - | - | - | - | 3,727 |
| Total Costs to be Financed | | | | | | | | | | | 190,337 |

Source: Asian Development Bank estimates

Table 31: Cost Estimate by Output – Bac Kan Province

| Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project Expenditure Accounts by Components - Totals Including Contingencies Bac Kan PPC (US\$ '000) | | | | | | | | | | | |
|---|---|-----------------------|--|-----------------------|--|-----------------------|--|-----------------------|--------------------|-----------------------|--------|
| | Output 1: Road network connectivity improved | Share of Category (%) | Output 2: Rural water supply improved | Share of Category (%) | Output 3: ARVCs in Lang Son province improved | Share of Category (%) | Output 4: Decentralized public asset management processes established | Share of Category (%) | Project Management | Share of Category (%) | Total |
| I. Investment Costs | | | | | | | | | | | |
| A. Civil Works | | | | | | | | | | | |
| 1. Roads and Bridges | 28,633 | 100% | - | - | - | - | - | - | - | - | 28,633 |
| 2. Water Supply | - | - | 5,015 | 100% | - | - | - | - | - | - | 5,015 |
| Subtotal | 28,633 | 85% | 5,015 | 15% | - | - | - | - | - | - | 33,648 |
| C. Land Acquisition | 1,795 | 98% | 42 | 2% | - | - | - | - | - | - | 1,836 |
| D. Subproject Others | 1,035 | 86% | 166 | 14% | - | - | - | - | - | - | 1,201 |
| E. Road Safety Awareness | 75 | 100% | - | - | - | - | - | - | - | - | 75 |
| I. Asset Management Systems | - | - | - | - | - | - | 500 | 100% | - | - | 500 |
| J. Consulting Services | | | | | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | - | - | - | - | - | - | - | - | 401 | 100% | 401 |
| 2. Design contracts | 1,381 | 85% | 240 | 15% | - | - | - | - | - | - | 1,621 |
| 3. Construction Supervision contracts | 677 | 83% | 138 | 17% | - | - | - | - | - | - | 815 |
| 5. Audit | - | - | - | - | - | - | - | - | 53 | 100% | 53 |
| Subtotal | 2,058 | 71% | 378 | 13% | - | - | - | - | 454 | 16% | 2,890 |
| K. Project Management | | | | | | | | | | | |
| 1. Staff Costs | - | - | - | - | - | - | - | - | 356 | 100% | 356 |
| 2. Office Equipment | - | - | - | - | - | - | - | - | 23 | 100% | 23 |
| 3. Office and Refurbishment costs | - | - | - | - | - | - | - | - | 11 | 100% | 11 |
| 4. Operating Costs | - | - | - | - | - | - | - | - | 131 | 100% | 131 |
| 5. GAP Implementation | - | - | - | - | - | - | - | - | 31 | 100% | 31 |
| 6. EMP Implementation | - | - | - | - | - | - | - | - | 47 | 100% | 47 |
| Subtotal | - | - | - | - | - | - | - | - | 601 | 100% | 601 |
| L. Project Preparation Costs | - | - | - | - | - | - | - | - | 791 | 100% | 791 |
| Total Investment Costs | 33,596 | 81% | 5,601 | 13% | - | - | 500 | 1% | 1,846 | 4% | 41,543 |
| II. Recurrent Costs | | | | | | | | | | | |
| Total PROJECT COSTS | 33,596 | 81% | 5,601 | 13% | - | - | 500 | 1% | 1,846 | 4% | 41,543 |
| Interest During Implementation | - | - | - | - | - | - | - | - | - | - | 866 |
| Total Disbursement | | | | | | | | | | | 42,408 |

Source: Asian Development Bank estimates

Table 32: Cost Estimate by Output – Cao Bang Province

| Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project Expenditure Accounts by Components - Totals Including Contingencies Cao Bang PPC (US\$ '000) | | Output 1: Road network connectivity improved | Share of Category (%) | Output 2: Rural water supply improved | Share of Category (%) | Output 4: Decentralized public asset management processes established | Share of Category (%) | Project Management | Share of Category (%) | Total |
|---|---------------|--|--------------------------------|--|--------------------------------|--|--------------------------------|-----------------------|--------------------------------|---------------|
| I. Investment Costs | | | | | | | | | | |
| A. Civil Works | | | | | | | | | | |
| 1. Roads and Bridges | 29,717 | 100% | - | - | - | - | - | - | - | 29,717 |
| 2. Water Supply | - | - | 4,448 | 100% | - | - | - | - | - | 4,448 |
| Subtotal | 29,717 | 87% | 4,448 | 13% | - | - | - | - | - | 34,165 |
| C. Land Acquisition | 3,521 | 98% | 60 | 2% | - | - | - | - | - | 3,580 |
| D. Subproject Others | 1,491 | 87% | 225 | 13% | - | - | - | - | - | 1,716 |
| I. Asset Management Systems | - | - | - | - | 500 | 100% | - | - | - | 500 |
| J. Consulting Services | | | | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | - | - | - | - | - | - | 327 | 100% | - | 327 |
| 2. Design contracts | 1,096 | 90% | 126 | 10% | - | - | - | - | - | 1,222 |
| 3. Construction Supervision contracts | 615 | 71% | 247 | 29% | - | - | - | - | - | 863 |
| 5. Audit | - | - | - | - | - | - | 53 | 100% | - | 53 |
| Subtotal | 1,711 | 69% | 374 | 15% | - | - | 380 | 15% | - | 2,465 |
| K. Project Management | | | | | | | | | | |
| 1. Staff Costs | - | - | - | - | - | - | 348 | 100% | - | 348 |
| 3. Office and Refurbishment costs | - | - | - | - | - | - | 15 | 100% | - | 15 |
| 4. Operating Costs | - | - | - | - | - | - | 114 | 100% | - | 114 |
| 5. GAP Implementation | - | - | - | - | - | - | 15 | 100% | - | 15 |
| 6. EMP Implementation | - | - | - | - | - | - | 38 | 100% | - | 38 |
| Subtotal | - | - | - | - | - | - | 531 | 100% | - | 531 |
| Total Investment Costs | 36,440 | 85% | 5,106 | 12% | 500 | 1% | 911 | 2% | - | 42,957 |
| II. Recurrent Costs | | | | | | | | | | |
| Total PROJECT COSTS | 36,440 | 85% | 5,106 | 12% | 500 | 1% | 911 | 2% | - | 42,957 |
| Interest During Implementation | - | - | - | - | - | - | - | - | - | 711 |
| Total Disbursement | - | - | - | - | - | - | - | - | - | 43,668 |

Source: Asian Development Bank estimates

Table 33: Cost Estimate by Output – Ha Giang Province

| Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project Expenditure Accounts by Components - Totals Including Contingencies Ha Giang PPC (US\$ '000) | | Output 1: Road network connectivity improved | Share of Category (%) | Output 2: Rural water supply improved | Share of Category (%) | Output 4: Decentralized public asset management processes established | Share of Category (%) | Project Management | Share of Category (%) | Total |
|---|---------------|--|--------------------------------|--|--------------------------------|--|--------------------------------|-----------------------|--------------------------------|---------------|
| I. Investment Costs | | | | | | | | | | |
| A. Civil Works | | | | | | | | | | |
| 1. Roads and Bridges | 29,162 | 100% | - | - | - | - | - | - | - | 29,162 |
| 2. Water Supply | - | - | 5,364 | 100% | - | - | - | - | - | 5,364 |
| Subtotal | 29,162 | 84% | 5,364 | 16% | - | - | - | - | - | 34,526 |
| C. Land Acquisition | 2,754 | 98% | 46 | 2% | - | - | - | - | - | 2,800 |
| D. Subproject Others | 910 | 88% | 123 | 12% | - | - | - | - | - | 1,033 |
| E. Road Safety Awareness | 75 | 100% | - | - | - | - | - | - | - | 75 |
| I. Asset Management Systems | - | - | - | - | 500 | 100% | - | - | - | 500 |
| J. Consulting Services | | | | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | - | - | - | - | - | - | 529 | 100% | - | 529 |
| 2. Design contracts | 1,160 | 85% | 199 | 15% | - | - | - | - | - | 1,359 |
| 3. Construction Supervision contracts | 443 | 64% | 248 | 36% | - | - | - | - | - | 691 |
| 5. Audit | - | - | - | - | - | - | 53 | 100% | - | 53 |
| Subtotal | 1,603 | 61% | 447 | 17% | - | - | 582 | 22% | - | 2,632 |
| K. Project Management | | | | | | | | | | |
| 1. Staff Costs | - | - | - | - | - | - | 398 | 100% | - | 398 |
| 3. Office and Refurbishment costs | - | - | - | - | - | - | 14 | 100% | - | 14 |
| 4. Operating Costs | - | - | - | - | - | - | 36 | 100% | - | 36 |
| 5. GAP Implementation | - | - | - | - | - | - | 36 | 100% | - | 36 |
| 6. EMP Implementation | - | - | - | - | - | - | 76 | 100% | - | 76 |
| Subtotal | - | - | - | - | - | - | 560 | 100% | - | 560 |
| Total Investment Costs | 34,503 | 82% | 5,981 | 14% | 500 | 1% | 1,142 | 3% | - | 42,127 |
| II. Recurrent Costs | | | | | | | | | | |
| Total PROJECT COSTS | 34,503 | 82% | 5,981 | 14% | 500 | 1% | 1,142 | 3% | - | 42,127 |
| Interest During Implementation | - | - | - | - | - | - | - | - | - | 744 |
| Total Disbursement | - | - | - | - | - | - | - | - | - | 42,871 |

Source: Asian Development Bank estimates

Table 34: Cost Estimate by Output – Lang Son Province

| Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project | | | | | | | | | | | |
|--|---|-----------------------|--|-----------------------|---|-----------------------|--|-----------------------|--------------------|-----------------------|---------------|
| Expenditure Accounts by Components - Totals Including Contingencies | | | | | | | | | | | |
| Lang Son PPC (US\$ '000) | | | | | | | | | | | |
| | Output 1: Road network connectivity improved | Share of Category (%) | Output 2: Rural water supply improved | Share of Category (%) | Output 3: ARVCs infr in Lang Son province improved | Share of Category (%) | Output 4: Decentralized public asset management processes established | Share of Category (%) | Project Management | Share of Category (%) | Total |
| I. Investment Costs | | | | | | | | | | | |
| A. Civil Works | | | | | | | | | | | |
| 1. Roads and Bridges | 29,598 | 100% | - | - | - | - | - | - | - | - | 29,598 |
| 2. Water Supply | - | - | 5,174 | 100% | - | - | - | - | - | - | 5,174 |
| Subtotal | 29,598 | 85% | 5,174 | 15% | - | - | - | - | - | - | 34,772 |
| C. Land Acquisition | 3,387 | 97% | 122 | 3% | - | - | - | - | - | - | 3,509 |
| D. Subproject Others | 1,888 | 80% | 38 | 2% | 435 | 18% | - | - | - | - | 2,361 |
| F. HortLangSon_Operation | - | - | - | - | 1,104 | 100% | - | - | - | - | 1,104 |
| H. Value Chain Grants | - | - | - | - | 11,290 | 100% | - | - | - | - | 11,290 |
| I. Asset Management Systems | - | - | - | - | - | - | 500 | 100% | - | - | 500 |
| J. Consulting Services | | | | | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | - | - | - | - | - | - | - | - | 466 | 100% | 466 |
| 2. Design contracts | 786 | 75% | 257 | 25% | - | - | - | - | - | - | 1,043 |
| 3. Construction Supervision contracts | 737 | 85% | 134 | 15% | - | - | - | - | - | - | 871 |
| 4. HortLangSon_ServiceProvider | - | - | - | - | 2,994 | 100% | - | - | - | - | 2,994 |
| 5. Audit | - | - | - | - | - | - | - | - | 53 | 100% | 53 |
| Subtotal | 1,523 | 28% | 392 | 7% | 2,994 | 55% | - | - | 519 | 10% | 5,427 |
| K. Project Management | | | | | | | | | | | |
| 1. Staff Costs | - | - | - | - | - | - | - | - | 242 | 100% | 242 |
| 2. Office Equipment | - | - | - | - | - | - | - | - | 137 | 100% | 137 |
| 4. Operating Costs | - | - | - | - | - | - | - | - | 275 | 100% | 275 |
| 5. GAP Implementation | - | - | - | - | - | - | - | - | 12 | 100% | 12 |
| 6. EMP Implementation | - | - | - | - | - | - | - | - | 41 | 100% | 41 |
| Subtotal | - | - | - | - | - | - | - | - | 708 | 100% | 708 |
| L. Project Preparation Costs | - | - | - | - | - | - | - | - | 312 | 100% | 312 |
| Total Investment Costs | 36,396 | 61% | 5,725 | 10% | 15,824 | 26% | 500 | 1% | 1,539 | 3% | 59,984 |
| Interest During Implementation | - | - | - | - | - | - | - | - | - | - | 1,406 |
| Total Disbursement | | | | | | | | | | | 61,390 |

Source: Asian Development Bank estimates

H. Detailed Cost Estimates by Year

Table 35: Cost Estimate by Year – Overall

| Expenditure Accounts by Years (US\$ '000) | Totals Including Contingencies | | | | | Total |
|--|--------------------------------|--------|--------|--------|--------|---------|
| | 2018 | 2019 | 2020 | 2021 | 2022 | |
| I. Investment Costs | | | | | | |
| A. Civil Works | | | | | | |
| 1. Roads and Bridges | - | 2,068 | 20,873 | 52,375 | 41,794 | 117,110 |
| 2. Water Supply | - | 645 | 3,862 | 7,899 | 7,595 | 20,001 |
| Subtotal | - | 2,714 | 24,735 | 60,273 | 49,388 | 137,111 |
| C. Land Acquisition | - | 7,531 | 3,687 | 508 | - | 11,725 |
| D. Subproject Others | 136 | 1,598 | 2,229 | 1,958 | 391 | 6,312 |
| E. Road Safety Awareness | - | 19 | 56 | 56 | 19 | 150 |
| F. HortLangSon_Operation | 84 | 338 | 309 | 186 | 188 | 1,104 |
| H. Value Chain Grants | 694 | 2,163 | 4,501 | 2,383 | 1,549 | 11,290 |
| I. Asset Management Systems | - | 500 | 500 | 500 | 500 | 2,000 |
| J. Consulting Services | | | | | | |
| 1. Loan Implementation Consultant (LIC) | 256 | 419 | 419 | 374 | 256 | 1,724 |
| 2. Design contracts | 740 | 2,049 | 1,833 | 547 | 76 | 5,246 |
| 3. Construction Supervision contracts | - | 6 | 495 | 1,578 | 1,161 | 3,240 |
| 4. HortLangSon_ServiceProvider | 315 | 1,233 | 881 | 565 | - | 2,994 |
| 5. Audit | 41 | 42 | 42 | 43 | 44 | 212 |
| Subtotal | 1,352 | 3,749 | 3,670 | 3,107 | 1,537 | 13,415 |
| K. Project Management | | | | | | |
| 1. Staff Costs | 261 | 265 | 269 | 273 | 277 | 1,345 |
| 2. Office Equipment | 161 | - | - | - | - | 161 |
| 3. Office and Refurbishment costs | 40 | - | - | - | - | 40 |
| 4. Operating Costs | 109 | 111 | 112 | 114 | 111 | 557 |
| 5. GAP Implementation | 4 | 22 | 23 | 23 | 23 | 95 |
| 6. EMP Implementation | - | 49 | 50 | 51 | 52 | 202 |
| Subtotal | 575 | 447 | 454 | 461 | 463 | 2,400 |
| L. Project Preparation Costs | 155 | 948 | - | - | - | 1,103 |
| Total Investment Costs | 2,995 | 20,006 | 40,142 | 69,432 | 54,034 | 186,611 |
| II. Recurrent Costs | | | | | | |
| Total PROJECT COSTS | 2,995 | 20,006 | 40,142 | 69,432 | 54,034 | 186,611 |
| Share of Total Project Costs | 2% | 11% | 22% | 37% | 29% | 100% |
| Interest During Implementation | | | | | | 3,727 |
| Total Costs to be Financed | | | | | | 190,337 |

Source: Asian Development Bank estimates

Table 36: Cost Estimate by Year – Bac Kan Province

| Expenditure Accounts by Years | | Totals Including Contingencies | | | | | |
|---|--|--------------------------------|-------|--------|--------|--------|--------|
| Bac Kan PPC (US\$ '000) | | 2018 | 2019 | 2020 | 2021 | 2022 | Total |
| I. Investment Costs | | | | | | | |
| A. Civil Works | | | | | | | |
| 1. Roads and Bridges | | - | 2,022 | 7,055 | 8,460 | 11,095 | 28,633 |
| 2. Water Supply | | - | 592 | 776 | 1,374 | 2,273 | 5,015 |
| Subtotal | | - | 2,614 | 7,831 | 9,834 | 13,368 | 33,648 |
| C. Land Acquisition | | - | 1,143 | 693 | - | - | 1,836 |
| D. Subproject Others | | - | 392 | 467 | 342 | - | 1,201 |
| E. Road Safety Awareness | | - | 19 | 37 | 19 | - | 75 |
| I. Asset Management Systems | | - | 125 | 125 | 125 | 125 | 500 |
| J. Consulting Services | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | | 49 | 105 | 102 | 89 | 56 | 401 |
| 2. Design contracts | | 71 | 578 | 766 | 205 | - | 1,621 |
| 3. Construction Supervision contracts | | - | - | 94 | 377 | 343 | 815 |
| 5. Audit | | 10 | 10 | 11 | 11 | 11 | 53 |
| Subtotal | | 130 | 694 | 973 | 683 | 411 | 2,890 |
| K. Project Management | | | | | | | |
| 1. Staff Costs | | 69 | 70 | 71 | 72 | 73 | 356 |
| 2. Office Equipment | | 23 | - | - | - | - | 23 |
| 3. Office and Refurbishment costs | | 11 | - | - | - | - | 11 |
| 4. Operating Costs | | 26 | 27 | 27 | 28 | 23 | 131 |
| 5. GAP Implementation | | - | 8 | 8 | 8 | 8 | 31 |
| 6. EMP Implementation | | - | 12 | 12 | 12 | 12 | 47 |
| Subtotal | | 130 | 116 | 118 | 120 | 116 | 601 |
| L. Project Preparation Costs | | - | 791 | - | - | - | 791 |
| Total Investment Costs | | 260 | 5,894 | 10,245 | 11,122 | 14,020 | 41,543 |
| II. Recurrent Costs | | | | | | | |
| Total PROJECT COSTS | | 260 | 5,894 | 10,245 | 11,122 | 14,020 | 41,543 |
| Share of Total Project Costs | | 1% | 14% | 25% | 27% | 34% | 100% |
| Interest During Implementation | | | | | | | 866 |
| Total Disbursement | | | | | | | 42,408 |

Source: Asian Development Bank estimates

Table 37: Cost Estimate by Year – Cao Bang Province

| Expenditure Accounts by Years Cao Bang PPC (US\$ '000) | Totals Including Contingencies | | | | | Total |
|---|--------------------------------|-------|-------|--------|--------|--------|
| | 2018 | 2019 | 2020 | 2021 | 2022 | |
| I. Investment Costs | | | | | | |
| A. Civil Works | | | | | | |
| 1. Roads and Bridges | - | - | 4,178 | 13,264 | 12,275 | 29,717 |
| 2. Water Supply | - | 3 | 992 | 2,069 | 1,384 | 4,448 |
| Subtotal | - | 3 | 5,170 | 15,334 | 13,659 | 34,165 |
| C. Land Acquisition | - | 2,273 | 1,302 | 5 | - | 3,580 |
| D. Subproject Others | - | 429 | 646 | 605 | 35 | 1,716 |
| I. Asset Management Systems | - | 125 | 125 | 125 | 125 | 500 |
| J. Consulting Services | | | | | | |
| 1. Loan Implementation Consultant (LIC) | 22 | 77 | 92 | 84 | 51 | 327 |
| 2. Design contracts | 92 | 517 | 461 | 152 | - | 1,222 |
| 3. Construction Supervision contracts | - | - | 159 | 404 | 300 | 863 |
| 5. Audit | 10 | 10 | 11 | 11 | 11 | 53 |
| Subtotal | 125 | 604 | 723 | 651 | 362 | 2,465 |
| K. Project Management | | | | | | |
| 1. Staff Costs | 68 | 69 | 70 | 71 | 72 | 348 |
| 3. Office and Refurbishment costs | 15 | - | - | - | - | 15 |
| 4. Operating Costs | 22 | 23 | 23 | 23 | 24 | 114 |
| 5. GAP Implementation | - | 4 | 4 | 4 | 4 | 15 |
| 6. EMP Implementation | - | 9 | 9 | 10 | 10 | 38 |
| Subtotal | 105 | 104 | 106 | 107 | 109 | 531 |
| Total Investment Costs | 229 | 3,538 | 8,071 | 16,828 | 14,290 | 42,957 |
| II. Recurrent Costs | | | | | | |
| Total PROJECT COSTS | 229 | 3,538 | 8,071 | 16,828 | 14,290 | 42,957 |
| Share of Total Project Costs | 1% | 8% | 19% | 39% | 33% | 100% |
| Interest During Implementation | | | | | | 711 |
| Total Disbursement | | | | | | 43,668 |

Source: Asian Development Bank estimates

Table 38: Cost Estimate by Year – Ha Giang Province

| Expenditure Accounts by Years | | Totals Including Contingencies | | | | | |
|---|--|---------------------------------------|-------------|-------------|-------------|-------------|--------------|
| Ha Giang PPC (US\$ '000) | | 2018 | 2019 | 2020 | 2021 | 2022 | Total |
| I. Investment Costs | | | | | | | |
| A. Civil Works | | | | | | | |
| 1. Roads and Bridges | | - | 46 | 5,391 | 12,921 | 10,804 | 29,162 |
| 2. Water Supply | | - | 51 | 1,078 | 2,392 | 1,843 | 5,364 |
| Subtotal | | - | 97 | 6,469 | 15,313 | 12,647 | 34,526 |
| C. Land Acquisition | | - | 1,287 | 1,134 | 379 | - | 2,800 |
| D. Subproject Others | | 28 | 254 | 287 | 271 | 194 | 1,033 |
| E. Road Safety Awareness | | - | - | 19 | 37 | 19 | 75 |
| I. Asset Management Systems | | - | 125 | 125 | 125 | 125 | 500 |
| J. Consulting Services | | | | | | | |
| 1. Loan Implementation Consultant (LIC) | | 99 | 124 | 121 | 107 | 78 | 529 |
| 2. Design contracts | | 188 | 590 | 316 | 189 | 76 | 1,359 |
| 3. Construction Supervision contracts | | - | 6 | 116 | 302 | 267 | 691 |
| 5. Audit | | 10 | 10 | 11 | 11 | 11 | 53 |
| Subtotal | | 298 | 730 | 564 | 609 | 433 | 2,632 |
| K. Project Management | | | | | | | |
| 1. Staff Costs | | 77 | 78 | 80 | 81 | 82 | 398 |
| 3. Office and Refurbishment costs | | 14 | - | - | - | - | 14 |
| 4. Operating Costs | | 7 | 7 | 7 | 7 | 7 | 36 |
| 5. GAP Implementation | | - | 9 | 9 | 9 | 9 | 36 |
| 6. EMP Implementation | | - | 19 | 19 | 19 | 19 | 76 |
| Subtotal | | 99 | 113 | 115 | 116 | 118 | 560 |
| Total Investment Costs | | 424 | 2,605 | 8,711 | 16,850 | 13,536 | 42,127 |
| II. Recurrent Costs | | | | | | | |
| Total PROJECT COSTS | | 424 | 2,605 | 8,711 | 16,850 | 13,536 | 42,127 |
| Interest During Implementation | | | | | | | 744 |
| Total Disbursement | | | | | | | 42,871 |

Source: Asian Development Bank estimates

Table 39: Cost Estimate by Year – Lang Son Province

| Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project | | | | | | |
|--|---------------------------------------|--------------|---------------|---------------|---------------|---------------|
| Expenditure Accounts by Years | | | | | | |
| Lang Son PPC (US\$ '000) | | | | | | |
| | Totals Including Contingencies | | | | | |
| | 2018 | 2019 | 2020 | 2021 | 2022 | Total |
| I. Investment Costs | | | | | | |
| A. Civil Works | | | | | | |
| 1. Roads and Bridges | - | - | 4,249 | 17,730 | 7,619 | 29,598 |
| 2. Water Supply | - | - | 1,016 | 2,063 | 2,094 | 5,174 |
| Subtotal | - | - | 5,266 | 19,793 | 9,713 | 34,772 |
| C. Land Acquisition | - | 2,828 | 558 | 123 | - | 3,509 |
| D. Subproject Others | 108 | 522 | 829 | 740 | 162 | 2,361 |
| F. HortLangSon_Operation | 84 | 338 | 309 | 186 | 188 | 1,104 |
| H. Value Chain Grants | 694 | 2,163 | 4,501 | 2,383 | 1,549 | 11,290 |
| I. Asset Management Systems | - | 125 | 125 | 125 | 125 | 500 |
| J. Consulting Services | | | | | | |
| 1. Loan Implementation Consultant (LIC) | 85 | 113 | 104 | 94 | 70 | 466 |
| 2. Design contracts | 389 | 365 | 290 | - | - | 1,043 |
| 3. Construction Supervision contracts | - | - | 126 | 495 | 250 | 871 |
| 4. HortLangSon_ServiceProvider | 315 | 1,233 | 881 | 565 | - | 2,994 |
| 5. Audit | 10 | 10 | 11 | 11 | 11 | 53 |
| Subtotal | 800 | 1,722 | 1,411 | 1,164 | 331 | 5,427 |
| K. Project Management | | | | | | |
| 1. Staff Costs | 47 | 48 | 48 | 49 | 50 | 242 |
| 2. Office Equipment | 137 | - | - | - | - | 137 |
| 4. Operating Costs | 53 | 54 | 55 | 56 | 57 | 275 |
| 5. GAP Implementation | 4 | 2 | 2 | 2 | 2 | 12 |
| 6. EMP Implementation | - | 10 | 10 | 10 | 10 | 41 |
| Subtotal | 241 | 114 | 116 | 118 | 119 | 708 |
| L. Project Preparation Costs | 155 | 157 | - | - | - | 312 |
| Total Investment Costs | 2,082 | 7,968 | 13,115 | 24,631 | 12,188 | 59,984 |
| Share of Total Project Costs | 3% | 13% | 22% | 41% | 20% | 100% |
| Interest During Implementation | | | | | | 1,406 |
| Total Disbursement | | | | | | 61,390 |

Source: Asian Development Bank estimates

I. Provincial Financing Cashflow

Table 40: Bac Kan

| BacKan | 2018 | 2019 | 2020 | 2021 | 2022 | Total |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| ADB Investment | 74 | 2,915 | 7,919 | 9,489 | 12,488 | 32,884 |
| ADB Int Charges | 0.4 | 16.1 | 100.0 | 269.0 | 480.2 | 866 |
| Annual Cash Flow-ADB (incl. Int) | 74 | 2,931 | 8,019 | 9,758 | 12,968 | 33,750 |
| Share of ADB Total Cost | 0% | 9% | 24% | 29% | 38% | 100% |
| Government Cashflow (incl. Tax) | 186 | 2,980 | 2,326 | 1,633 | 1,533 | 8,658 |
| Share of Government Total Cost | 2% | 34% | 27% | 19% | 18% | 100% |
| Total Project Cashflow | 261 | 5,911 | 10,345 | 11,391 | 14,500 | 42,408 |
| Share of Total Project Cost | 0.6% | 14% | 24% | 27% | 34% | 100.0% |

Source: Asian Development Bank estimates

Table 41: Cao Bang

| Cao Bang | 2018 | 2019 | 2020 | 2021 | 2022 | Total |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| ADB Investment | 93 | 482 | 5,278 | 14,470 | 12,713 | 33,036 |
| ADB Int Charges | 0 | 4 | 38 | 191 | 477 | 711 |
| Annual Cash Flow-ADB (incl. Int) | 94 | 487 | 5,317 | 14,662 | 13,189 | 33,750 |
| Share of ADB Total Cost | 0.3% | 1% | 16% | 43% | 39% | 100% |
| Government Cashflow (incl. Tax) | 136 | 3,056 | 2,792 | 2,356 | 1,578 | 9,918 |
| Share of Government Total Cost | 1% | 31% | 28% | 24% | 16% | 100% |
| Total Project Cashflow | 230 | 3,543 | 8,109 | 17,019 | 14,767 | 43,668 |
| Share of Total Project Cost | 0.5% | 8.1% | 18.6% | 39.0% | 33.8% | 100.0% |

Source: Asian Development Bank estimates

Table 42: Ha Giang

| Ha Giang | 2018 | 2019 | 2020 | 2021 | 2022 | Total |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| ADB Investment | 70 | 423 | 6,290 | 14,391 | 11,832 | 33,006 |
| ADB Int Charges | 0 | 4 | 41 | 209 | 490 | 744 |
| Annual Cash Flow-ADB (incl. Int) | 70 | 426 | 6,331 | 14,600 | 12,322 | 33,750 |
| Share of ADB Total Cost | 0.2% | 1% | 19% | 43% | 37% | 100% |
| Government Cashflow (incl. Tax) | 354 | 2,182 | 2,422 | 2,459 | 1,704 | 9,121 |
| Share of Government Total Cost | 4% | 24% | 27% | 27% | 19% | 100% |
| Total Project Cashflow | 425 | 2,609 | 8,753 | 17,059 | 14,026 | 42,871 |
| Share of Total Project Cost | 1% | 6% | 20% | 40% | 33% | 100% |

Source: Asian Development Bank estimates

Table 43: Lang Son

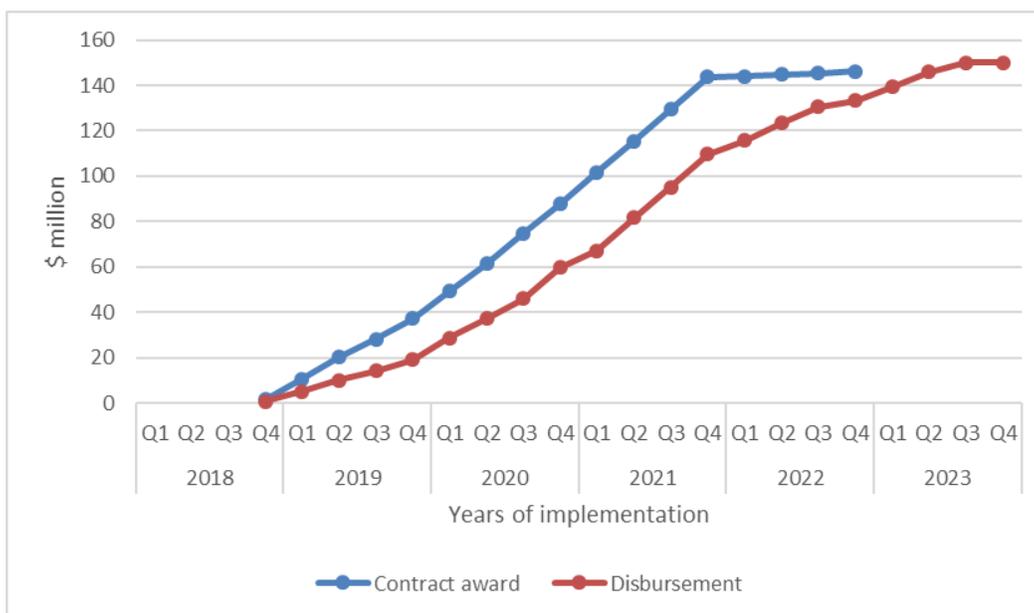
| Cashflow by Financier Lang Son (US\$ '000) | Costs | | | | | Total |
|--|--------------|-------------|-------------|-------------|-------------|--------------|
| | 2018 | 2019 | 2020 | 2021 | 2022 | |
| ADB - COL (excl Int) | 1,049 | 3,567 | 10,465 | 21,502 | 10,761 | 47,344 |
| Interest | 5 | 39 | 146 | 414 | 801 | 1,406 |
| ADB - COL -Total | 1,054 | 3,606 | 10,611 | 21,916 | 11,562 | 48,750 |
| Share of ADB by Year | 2% | 7% | 22% | 45% | 24% | 100% |
| Counterpart Funded (CF) Costs | 1,033 | 4,401 | 2,650 | 3,130 | 1,427 | 12,640 |
| Share of Counterpart by Year | 8% | 35% | 21% | 25% | 11% | 100% |
| Total Project costs | 2,087 | 8,007 | 13,261 | 25,046 | 12,989 | 61,390 |
| Share of Total Cost by Year | 3% | 13% | 22% | 41% | 21% | 100% |

Source: Asian Development Bank estimates

J. Contract and Disbursement S-Curve

Figure 6: ADB COL Contract and Disbursement S-Curve

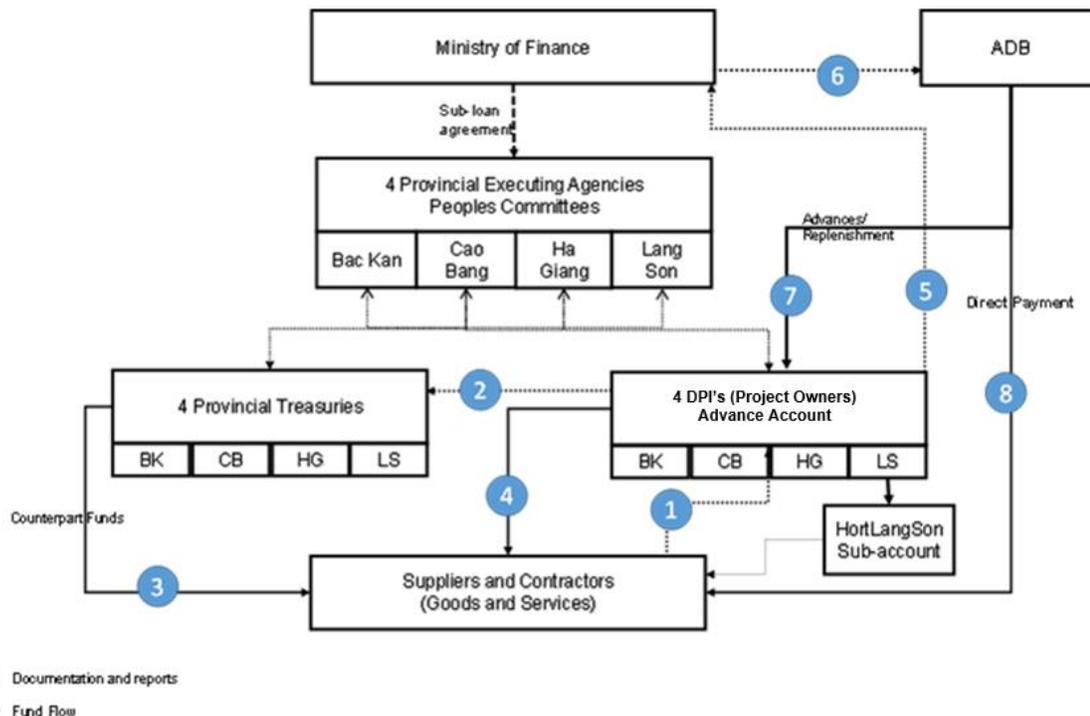
| | Contract Awards (in USD million) | | | | | Disbursements (in USD million) | | | | | | |
|------|----------------------------------|-----------|-----------|-----------|-----------|--------------------------------|---------------------|-----------|-----------|-----------|--|------------|
| | Q1 | Q2 | Q3 | Q4 | Total | Q1 | Q2 | Q3 | Q4 | Total | | |
| 2018 | 0.000000 | 0.000000 | 0.000000 | 1.555000 | 1.555000 | 0.000000 | 0.000000 | 0.000000 | 0.841900 | 0.841900 | | |
| 2019 | 8.990745 | 9.627745 | 7.990745 | 8.990745 | 35.599979 | 4.392526 | 4.732335 | 4.334419 | 4.776224 | 18.235504 | | |
| 2020 | 12.291847 | 12.000000 | 13.435000 | 12.868377 | 50.595224 | 9.672519 | 8.617328 | 8.672519 | 13.661875 | 40.624241 | | |
| 2021 | 14.000000 | 13.720139 | 13.832087 | 14.359260 | 55.911486 | 7.526824 | 14.428706 | 13.570549 | 14.473921 | 50.000000 | | |
| 2022 | 0.306870 | 0.814914 | 0.450792 | 1.039140 | 2.611715 | 5.888157 | 7.923562 | 6.888157 | 2.969455 | 23.669331 | | |
| 2023 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 6.038717 | 6.500000 | 4.090307 | 0.000000 | 16.629024 | | |
| | Total Contract Awards | | | | | 146.273404 | Total Disbursements | | | | | 150.000000 |



K. Fund Flow Diagram

56. Four advance accounts will be established (i.e. one for each province) under the DPIs and an additional subaccount for Lang Son to be held by HortLangSon once it is established with an approved business plan, work plan and budget forecast.

Figure 7: Project Funds Flow Chart



Notes to figure

- (i) Submission of claims
- (ii) Endorsement of claims payable
- (iii) Payment of claims from counterpart funds
- (iv) Payment of eligible claims for ADB-financed items from advance account
- (v) Submission of withdrawal applications for Advance, Liquidation/Replenishment and Direct Payment
- (vi) Endorsement of withdrawal applications for Advance, Liquidation/Replenishment and Direct Payment
- (vii) Deposit of Advance and Replenishments to advance accounts
- (viii) Direct payments of eligible claims for ADB-financed items

V. FINANCIAL MANAGEMENT

A. Financial Management Assessment

57. The overall FMA is presented in the context of ADB's sector modality for the BIIG1 project. The financial assessment uses the detail of representative subproject feasibility⁸ as well as the proposed financial structure and management of the overall project.

58. The main financial management risks that need to be managed by the EAs, IAs, and PMUs are: (i) implementation risk - lack of familiarity with ADB sector project subproject processing procedures, disbursement procedures and requirements leading to delayed project implementation, (ii) compliance risk - lack of familiarity with ADB financial management requirements, particularly on accounting, reporting and auditing, which may delay project reporting and derail identification of issues on the use of loan proceeds, (iii) financing risk – delays in provision of or inadequate counterpart funding which could delay project implementation, and (iv) operational risk - inadequate experience in building some project component that could impact project progress and quality of the services to be provided after project completion. The overall financial management risk-rating of the project before considering mitigating measures is high.

59. The EAs and/or IAs have agreed to implement an action plan as key measures to address the deficiencies. The financial management action plan is provided in table 44.

Table 44: Financial Management Action Plan

| Potential Risk Event | Suggested Action | Target Date for Implementation | Responsibility |
|--|---|--|----------------|
| Inadequate accounting systems | Assessment of accounting systems and recommendation for implementing/upgrading of accounting software and operating manuals for timely production of accounts as per national accounting standards. Assure DPI and PMU accounts are kept separately. | 1 month before effectiveness. | EAs/IAs |
| Inadequate Staffing systems | Confirmation of institutional structures and staffing qualifications and positions and recommendations for institutional and staffing systems as agreed in the PAM. | One month after loan agreement signing | EAs/IAs |
| Inadequate accounting staff in government agencies | Completion of identification and posting of adequate government staff including at least 3 financial management and accounting related staff in each PMU as per institutional structure agreed with | One month after loan effectiveness | EAs/IAs |

⁸ Under ADB OM (para. 3.), where the outputs of a project can be quantified but not valued, economic efficiency can be assessed in terms of cost-efficiency alone.

| Potential Risk Event | Suggested Action | Target Date for Implementation | Responsibility |
|---|--|--|----------------|
| | Government in the PAM. | | |
| Non-availability of qualified consultant staff | Completion of recruitment of loan implementation consultant's accounting staff | Upon Loan agreement signing | EAs/IAs |
| Inadequate internal control systems | Development of an operations manual including control systems and internal audit procedures, if relevant | One month before loan effectiveness | EAs/IAs |
| Counterpart fund management | Confirmation of project budget management system to manage funds flows for counterpart funds from provincial governments budget to the project | One month before loan signing | EAs/IAs |
| Weak external control | Recruitment of external auditors in a timely fashion to audit project accounts as agreed in the PAM. | Three months after loan effectiveness | EAs/IAs |
| Lack of experience in ADB funded projects and the required documentation and procedures | Capacity building for staff (enclosed separately below) | Within 12 months of loan effectiveness | EAs IAs |

60. It was agreed that the EAs and IAs will build capability by (i) setting up clear institutional arrangements and coordination mechanisms amongst the four provinces; (ii) completing staff deployment in appropriate financial management positions; (iii) ensuring each of PMUs has access to English language support; (iv) developing methodologies for managing cost escalation risks; (v) the need to monitor the risk of lags in foreign exchange movement that erode forecast currency devaluation under public-private partnership (PPP) cost estimation assumptions resulting financing shortfalls; and (vi) of undertaking more training, particularly on ADB policy and procedures so that they will have adequate administrative and accounting capacity to prepare and maintain proper SOE records and make them readily available for examination.

B. Risk Analysis

61. The risk assessment considered the staffing, internal control, accounting and reporting policies and procedures, and auditing standards and arrangements of the EA and IAs. Based on the assessment, the overall project financial management pre-mitigation risk is high.

1. Inherent Risk

62. Inherent risk is the susceptibility of the **project** financial management system to factors arising from the **environment in which it operates**, such as country rules and regulations and

project management entities and the political economy of their working environment. Table 45 presents an overall inherent risk summary.

Table 45: Inherent Risk Assessment

| Risk type | Risk Assessment | Risk Description | Mitigation Measures |
|--|------------------------|--|--|
| Country-specific | H | Incomplete and unclear fiscal decentralization, debt management and proposed public finance reforms result in a lack of certainty and clarity regarding internal controls, reporting, and procurement transparency Financial and procurement skills at provincial level are weak and face a challenge to keep up to date with reforms | Counterpart fund requirements are defined by local covenant Debt management agreements to be signed prior to approval of Government Investment Plan approval Contracted skills included in loan Implementation Consultancy |
| Entity-specific | S | Delay project implementation due to lack of familiarity with ADB disbursement procedures and requirements | Decentralized lending with PPC and IA staff that have no executing agency experience for mobilizing funds, reimbursement procedures. Further the Government procedures for ODA fund release and the requirement for provincial portfolio benchmarks to be achieved may delay the project access to funds whilst being outside the control of Project staff. Training on ADB financial management requirements, including disbursement, accounting and auditing, foreign exchange and interest rate risk management. |
| Overall Assessment of Inherent Risk | H | | |

2. Control Risk

63. Control risk is the risk that the project's accounting and internal control framework are inadequate to ensure project funds are used appropriately and efficiently for the purpose intended, and that the use of funds is properly recorded and reported with supporting. With the cumulative substantial financial risks, the overall project financial risk before mitigation is considered high as presented in Table 46.

Table 46: Control Risk Assessment

| Risk type | Risk Rating | Risk Description/Mitigation Measures |
|---|-------------|--|
| 1. Implementing Agencies (DPI and PMUs) | S | <p>Project financial management policies and procedures are in place for DPI budget and financial accounting systems.</p> <p>Each of the project IAs will adopt the generally accepted accounting principles as specified by the Ministry of Finance. The IA PMUs will set up a separate project accounting system within three months after loan effectiveness and each IAs will submit a copy of these to ADB financial management expert in VRM.</p> |
| 2. Funds Flow | S | <p>ADB loan is on-lent to each EA. Each EA will repay the portion made available to it through budget allocation whilst the State will repay the portion made available to the EAs under respective on-lending agreements. The loan will have a repayment period of 25 years, including a grace period of 5 years and the EAs will assume the foreign exchange and interest rate variation risks. Each PMU will open an advance account to manage the loan proceeds in line with the requirements in the Loan Agreement. Timely release of loan proceeds to each province will be required through loan covenant.</p> <p>Counterpart funds need to be mobilised from the PPC with a front-loaded cash-flow that may delay implementation consultant support.</p> |
| 3. Staffing | S | <p>PMU staffing is currently unknown as PMU establishment can be up to 30 days after loan signing. Staffing is proposed as a mix of existing government civil servants with lifetime employment and adequately qualified and contracted staff positions that are yet to be filled using project counterpart funding. No province has experience in acting as a loan EA and therefore the lack previous experience in financial management, familiarity with ADB loan management policies and procedures, and training on ADB loan management policies and procedures including procurement, disbursement and repayment policy need to be provided to enhance the professional capacity of relevant staff before implementing the project. Contracted staff and implementation support consultant are included in the design along with DPI and PMU participation in ADB in-country training and awareness programs prior to loan effectiveness</p> |
| 4. Internal Audit | S | <p>All IAs have internal audit training and undergo an internal audit annual, however these fail to meet international standards. The Project will be included in all internal audit procedures and reporting</p> |
| 5. External Audit | M | <p>The Project will use ADB funds finance the contracting and conducting of external audits according to international standards for which TOR are provided in the PAM</p> |

| Risk type | Risk Rating | Risk Description/Mitigation Measures |
|-----------------------------|-------------|---|
| 6. Reporting and Monitoring | M | Reporting will draw on the financial management systems management information system and the Project accounts with each IA receiving monthly reports, quarterly updates and annual results. Monitoring will be through the individual IA and their reporting to the Provincial EA plus through quarterly reports to ADB, and through the yearly external audit. The consolidation of the four provincial data sets will provide an additional control point to ensure data is reconciled and consistent. |
| 7. Information Systems | M | The EA and IAs will use stand-alone computerized accounting systems which produce financial statements automatically. Further each PMU will have a work planning and budgeting system based on ADBs (VRM) Project administration work books that links to the annual budget, disbursement and physical completion records for the basis of the PPMS |
| Overall Risk | H | |

ADB = Asian Development Bank, EA = executing agency, IA = implementing agency, MOF = Ministry of Finance, Note: Degrees of rating: H = high, S = substantial, M = moderate, and L = low. Source: Asian Development Bank.

64. Addressing the issues raised in the risk evaluation, the level of training and understanding required within the project implementation process was identified as varying by province. The exact extent required is difficult to determine when not all PMUs are in place and the respective staff not engaged. An initial part of capacity building under the project is a Training Needs Assessment (TNA) from which a training plan could be developed. The TNA would be directed at DOF and PMUs as well as for recipient line ministries. The initial training and capacity building plan is presented in Table 47 below and needs to be financed from local counterpart funds under Decree 16 provisions.

Table 47: Capacity Building and Training Summary

| Agency | Identified need | Proposed action | Delivered by |
|-----------------------------|-----------------------|--|--------------------------------|
| Overall | Needs not fully clear | 1. Training needs assessment by province to be extended and developed with suggestions below. 2. Overall implementation meeting for all interested parties explaining overall project and individual agencies role within framework. | Government |
| Provincial DPI | Coordination | 1. Regional briefing meeting on structure and operation as well as interface between provinces. 2. Overall procurement training on both ADB and Vietnamese procedures covering preparing ToRs, EOIs and RFP submission to CMS and procedure for award of contracts. | Government National Consultant |
| Provincial DOF/Lang Son PMU | Coordination | Regional briefing meeting on structure and operation as well as interface between provinces. | Government National Consultant |

| Agency | Identified need | Proposed action | Delivered by |
|-----------------------|--|---|---------------------------|
| PMU to be established | Establishment and ongoing operations along with reporting needs. | 1. Initial briefing of PMUs generally on their function and broad legal and ADB framework. 2. Detailed training by province on day to day operation of PMU. 3. Training on conducting procurement procedures. 4. Detailed training for accounting staff of PMU on recording, reporting and presentation of accounts within government and ADB requirements. 5. Awareness training on ADB Safeguard and Gender expectations and procedural requirement | Consultant/ Government |
| Related Banks | Uneven experience and little or no ADB loan exposure. | Briefing workshop for banks. Since three separate banks to be involved needs decision whether this is a separate exercise or can be combined. Suggested as separate. | DOF central |
| Project recipients | Possible no earlier experience on ODA procedures | Depending on bidding packages potential contractors need to be made aware of procedures and bidding regulations. | Government/DPI/PMU |

ADB = Asian Development Bank; DPI = department of planning and investment; ODA = official development assistance; PMU = project management unit

C. Fund Flow Mechanism

65. The GOV is the borrower of the ADB loan for financing the Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project. On behalf of the borrower, Ministry of Finance (MOF) will relend a portion of the proceeds of the loan to the four Executing Agencies being Bac Kan PPC, Cao Bang PPC, Ha Giang PPC, and Lang Son PPC while the balance will be made available to the EAs through budget allocation. The repayment period is 25 years, including a grace period of 5 years.

66. Each PMU will open an advance account to manage the loan proceeds in line with the requirements in the Loan Agreement. For Lang Son province, a subaccount will be opened to support the operation of the ARVC output.

D. Personnel

67. The financial staff of EA and IAs are a mix of government civil servants seconded to the PMU and contracted staff to ensure the correct experience and range of skills are available during implementation. It is expected that staff will need training to familiarize with ADB project-related disbursement guidelines and procedures, project accounting requirements, project and contract management, financial monitoring and report preparation. Additionally, somebody with English capability will be needed to support the finance teams, especially at the early stage of project implementation. Key risks relate to the timing of the formation of the final PMUs and the subsequent staffing of these. The PMUs can legally be formed up to 30 days after loan signing

with individual staff positions filled at this time. Currently, (i) positions within the PMU are proposed positions only, (ii) positions within the proposed PMU are indicated to be either seconded DPI staff or contracted positions however this may change on the formal establishment of the PMUs, (iii) the individuals to fill positions are unknown and as such the capability of staff is largely unknowable, (iv) the EAs and Project Owners may choose to modify the structures and also the nature of each position resulting in fewer full time contracted positions that are substituted for part time DPI seconded staff. The experience in Viet Nam PMU operation is that without full time staff PMU and project performance is significantly and adversely affected.

E. Disbursement

Disbursement Arrangements for ADB Funds

68. The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2017, as amended from time to time), and detailed arrangements agreed upon between the government and ADB. Online training for project staff on disbursement policies and procedures is available.⁹ Project staff are expected to complete this training to help ensure efficient disbursement and fiduciary control.

69. **Advance fund procedure.** 4 advance accounts (one for each EA) will be established at a commercial bank nominated by SBV and acceptable to ADB and maintained by each Project Owner as assigned by each PPC (EA). The Project Owner (IA) will be the DPI who will form a PMU that will in turn establish the provincial advance account. The currency of the advance accounts is USD. The advance account is to be used exclusively for ADB's share of eligible expenditures. The Project Owner on behalf of the PPC that established the advance account in its name is accountable and responsible for proper use of advances to the advance account.

70. The total outstanding advance to the advance accounts should not exceed the estimate of ADB's share of expenditures to be paid through the advance account for the forthcoming 6 months. The DPI/PMU on behalf of the PPC may request for initial and additional advances to the advance accounts based on an Estimate of Expenditure Sheet setting out the estimated expenditures to be financed through the accounts for the forthcoming 6 months.¹⁰ Supporting documents should be submitted to ADB or retained by the EAs and IAs in accordance with ADB's *Loan Disbursement Handbook* (2017, as amended from time to time) when liquidating or replenishing the advance accounts.

71. **Statement of expenditure procedure.**¹¹The SOE procedure is applied for items up to a ceiling of \$100,000. All supporting documents and records for the expenditures claimed under the SOE should be maintained and made readily available for review by ADB's disbursement and review missions, upon ADB's request for submission of supporting documents on a sampling basis, and for independent audit. Original documentation will be kept by the respective provincial PMUs while a copy of all documentation will be archived by the coordination unit within the lead province of Lang Son.

72. Before the submission of the first withdrawal application, the EA should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on

⁹ Disbursement eLearning. http://wpqr4.adb.org/disbursement_elearning

¹⁰ ADB. 2017. *Loan Disbursement Handbook*, Appendix 8A. Manila.

¹¹ SOE forms are available in Appendix 7B of ADB's *Loan Disbursement Handbook* (2017, as amended from time to time).

behalf of the government, together with the authenticated specimen signatures of each authorized person. The minimum value per withdrawal application is set in accordance with ADB's *Loan Disbursement Handbook (2017, as amended from time to time)*. Individual payments below this amount should be paid (i) by respective DPI and subsequently claimed to ADB through reimbursement, or (ii) through the advance fund procedure, unless otherwise accepted by ADB.

73. No withdrawals shall be made from the Loan Account for a particular project province until the respective on-lending Agreement, in form and substance satisfactory to ADB, has been duly authorized by, and executed and delivered on behalf of, the Borrower (or its authorized government entity) and the concerned Project Province, and is legally binding upon the parties thereto in accordance with its terms¹².

F. Accounting and Financial Reporting

74. Each IA/PMU will adopt accounting methods required by MOF to establish separate project accounts and records by funding source for all expenditures incurred on the project. Subsidiary ledgers will be maintained to facilitate reconciliation of accounts with the general ledger and bank records. All reports and supporting documents on all transactions will be stored and retained on a semi-permanent basis and will be accessible by authorized users, and are available for audit inspection. The IA will prepare individual project financial statements and submit to the EA for monitoring and each EA will submit their accounting records to the ADB via the Project Coordination Unit in Lang Son for consolidation and reporting.

75. The EAs through the IAs/PMUs will maintain, or cause to be maintained, separate books and records by funding source for all expenditures incurred on the project. Annual project financial statements will be prepared following modified cash-based accounting system in accordance with the government's accounting laws and regulations, specifically Circular No.195/2012/TT-BTC under the Vietnamese Accounting Standards (VAS).

76. Financial reporting follows the recent State Budget Law which covers the responsibilities including the duties of state agencies, revenue sources and spending authority, preparation of budget estimates, and on budgetary execution, along with details on accounting, auditing and disclosure requirements.

G. Budgeting System

77. The financial departments of EA and IAs are in charge of summarizing the preliminary budgets and make an overall annual budget for approval by the Project Owner on behalf of the EA (the respective PPC).

78. Detailed project budgets will be formulated by each PMU under the oversight of the financial management team, with input from the procurement expert, technical staff with input from relevant departments but the accounting staff needs to make sure the costs are incurred within the budget. The project budgets will be prepared annually by each IA and their PMU based on the work planning templates provided in the PAM and will include physical and financial targets.

79. Prior to loan effectiveness - a whole of life project work plan will be prepared with a supporting budget by project output, subproject, expenditure items, and disbursement category. This work plan and supporting budget will be continually applied for ongoing planning and

¹² Disbursement conditions for specific category/subcategory are set out in the Loan Agreement.

reporting by the PMU and monitoring by each IA. Budget monitoring reports will present a comparison between budgeted and actual amounts, and highlight budget variances with each PMU Project Director responsible for identifying and auctioning remedial actions to recover or reschedule activities that are delayed or incomplete. The Project Coordination Unit within Lang Son Province PMU will provide the consolidation of planning, budgeting and progress records across all four EAs and report this to ADB.

H. Safeguard of Assets

80. Subsidiary records of fixed assets and stocks are currently considered to be well managed and kept up-to-date and reconciled with control accounts of the IA periodically. The EA and IAs will conduct annual physical inventory of all project assets and all subproject assets will remain on the PMU registry until formally handed over to asset managers on completion. During the construction insurance, shall be the responsibility of contractors and shall cover worker compensation for losses due to accidents apart from compensation for property.

I. Auditing and Public Disclosure

81. The Government of Viet Nam has its internal audit system that each EAs and their IAs currently implement. The standards of internal audit are less than international standards creating a degree of risk that inappropriate use of resources may not be identified. The Consultant has discussed these risks with the Project Owners/IA and how internal auditing can play a constructive role in assuring normal financial management procedures and policies to the Project. The weakness and associated risks are systemic and without confirmed staff in positions the issue requires ongoing monitoring. The use of independent external audit seeks to offset the weakness of internal controls if the scope of the external audit includes the confirmation of details recorded for transactions as opposed to be limited to the confirmation of a transaction paper trail.

82. Each of the PPCs through the IAs/PMUs will cause its own detailed project financial statements to be audited in accordance with International Standards on Auditing by an independent auditor acceptable to ADB. The audited project financial statements together with the auditor's opinion and management letter will be presented in the English language to ADB within 6 months from the end of the fiscal year by the PPCs through the DPI/PMUs.

83. The audit report for the project financial statements will include a management letter and auditor's opinions, which cover (i) whether the project financial statements present an accurate and fair view or are presented fairly, in all material respects, in accordance with the applicable financial reporting standards; (ii) whether the proceeds of the loan were used only for the purpose(s) of the project; and (iii) whether the borrower or executing agency was in compliance with the financial covenants contained in the legal agreements (where applicable).

84. Compliance with financial reporting and auditing requirements will be monitored by review missions and during normal program supervision, and followed up regularly with all concerned.

85. The government, the four NEP PPCs and DPI/PMU's have been made aware of ADB's approach to delayed submission, and the requirements for satisfactory and acceptable quality of the audited project financial statements¹³. ADB reserves the right to require a change in the

¹³ ADB's approach and procedures regarding delayed submission of audited project financial statements:

auditor (in a manner consistent with the constitution of the borrower), or for additional support to be provided to the auditor, if the audits required are not conducted in a manner satisfactory to ADB, or if the audits are substantially delayed. ADB reserves the right to verify the project's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB's policies and procedures.

86. Public disclosure of the audited project financial statements, including the auditor's opinion on the project financial statements, will be guided by ADB's Public Communications Policy 2011.¹⁴ After the review, ADB will disclose the audited project financial statements and the opinion of the auditors on the project financial statements no later than 14 days of ADB's confirmation of their acceptability by posting them on ADB's website. The management letter, additional auditor's opinions will not be disclosed.¹⁵

J. Reporting and Monitoring

87. The project financial reports will be prepared using existing Public-Sector budget accounting software systems and are submitted on a monthly, quarterly and annual basis. The reports will highlight the physical and financial progress of subprojects being undertaken in comparison with the proposed annual work plan and budgets established prior to end of the previous year. Reports will be produced for each subproject, each IA/EA and for the overall project. During project implementation, financial reports will be prepared and submitted to the DPI and the PPC of each province and to ADB as quarterly progress reports for individual outputs. The financial report will be used for monitoring progress of project implementation and compare actual expenditure with budgeted and programmed allocations. The Project Coordination Unit Lang Son will consolidate each EA reports into a project level report, however it should be noted to avoid cash flow constraints and delays, each EA will submit their financial and procurement approval requests and their financial withdrawal applications direct to ADB with the record of these shared with the coordination unit. As such, the coordination unit will not be involved with the presentation of procurement approvals, or withdrawal applications to ADB they will however be copied on all records so that a consolidated Project level record is established and maintained.

K. Information Systems

88. A computerized accounting system will be used by each PMU for the accounting records, payment financial statement including balance sheet, income statement and cash flow statement. The financial reports are generated by the computer system rather than by manual. The financial data and the operational information have not been inter-connected in the system, and reconciliations are realized by regular manual checks.

-
- (i) When audited project financial statements are not received by the due date, ADB will write to the executing agency advising that (a) the audit documents are overdue; and (b) if they are not received within the next 6 months, requests for new contract awards and disbursement such as new replenishment of advance accounts, processing of new reimbursement, and issuance of new commitment letters will not be processed.
 - (ii) When audited project financial statements are not received within 6 months after the due date, ADB will withhold processing of requests for new contract awards and disbursement such as new replenishment of advance accounts, processing of new reimbursement and issuance of new commitment letters. ADB will (a) inform the executing agency of ADB's actions; and (b) advise that the loan may be suspended if the audit documents are not received within the next 6 months.
 - (iii) When audited project financial statements are not received within 12 months after the due date, ADB may suspend the loan.

¹⁴ Public Communications Policy: <http://www.adb.org/documents/pcp-2011?ref=site/disclosure/publications>

¹⁵ This type of information would generally fall under public communications policy exceptions to disclosure. ADB. 2011. *Public Communications Policy*. Manila. (Paragraph 97(iv) and/or 97(v)).

89. A key source of information will be the ADB VRM project administration workbooks that provide subproject and overall project level work plans, budgets, monthly cash flow projections and records, contract award schedules and disbursement projections. The workbooks will form the basis of a Provincial level PPMS that will interface with the project accounting systems to report physical and financial progress against agreed quarterly reporting indicators.

90. Existing accounting software systems of the EAs and IAs are sufficient for supporting the project information system and for generating project reports required for both external and internal use. In addition, all current staff in the IAs are familiar with these systems, although supplementary training in reporting requirements for the ADB financed project will be provided and is available on-line as e-learning courses. Systems and procedures for regular back-ups of all accounting systems and appropriate security measures of backed-up data are in place.

L. Financial Capacity Assessment Results

91. Table 48 below summarizes the assessment results on the financial management capacities. It illustrates that skills in the general financial management practices such as book keeping, statutory reporting, and project budgeting and costing are sufficiently acquired. They are good at the computerized accounting system and payment processing, project budgeting and costing. Internal auditing, project modeling and evaluation, management accounting and reporting need some enhancement at average.

Table 48: Financial Capacity Assessment Summary

| Skills Required | Current Level | Comments |
|---|----------------------|--|
| Financial accounting (book keeping) | Medium | Staff skills in this area are well possessed. |
| Entity treasury (debt financing, investment, cash management) | Medium | EA debt management systems are being addressed prior to loan effectiveness. |
| Statutory reporting | High | Financial reports are regularly prepared. No obvious problem has been found by the auditor however the standards are lower than required by ADB. But there is limited understanding of the financial reporting requirements for ADB funding. |
| Computerized accounting | High | The accounting system has been fully computerized and connected with the CQTG headquarters. |
| Management accounting and reporting | Medium | The management and operation are comparatively complex and management accounting needs to be improved. |
| Budgeting | Medium | The budget system is running well. |
| Project budgeting and costing | Medium | Each project has a budget and is renewed every year. Budget control is well in place. Project costing is conducted as a routine work. |
| Financial modeling and project evaluation techniques | Medium | Project costing and evaluations are undertaken by consultants. |
| Internal control and audit | Low | The internal control is done mainly through the computerized accounting system. The internal audit is annual but does not review |

| Skills Required | Current Level | Comments |
|------------------------|----------------------|--------------------------------|
| | | transaction records in detail. |

Source: Asian Development Bank.

VI. PROCUREMENT AND CONSULTING SERVICES

A. Advance Contracting

92. All advance contracting will be undertaken in conformity with ADB Procurement Guidelines (2015, as amended from time to time) and ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). The issuance of invitations to bid under advance contracting will be subject to ADB approval. The borrower, the four NEP PPC's, and DPI/PMU's have been advised that approval of advance contracting and retroactive financing does not commit ADB to finance the project.

93. No advanced contracting is envisaged, however advanced actions for the procurement of (i) LIC, and (ii) detailed design including the preparation of terms of reference, request for proposals, expression of interest, for the above consulting services and including the formation of a procurement evaluation committee to evaluate proposals, and the ranking of proposal prior to loan signing.

B. Procurement of Goods, Works, and Consulting Services

94. All procurement of goods and works will be undertaken in accordance with ADB's Procurement Guidelines (2015, as amended from time to time). Those contracts procured using National Competitive Bidding (NCB) will follow the national procurement laws, subject to the modifications described in the NCB Annex attached to the Procurement Plan. Procurement of goods will use International Competitive Bidding (ICB) procedures if over \$2 million, NCB if \$2 million or less, shopping if less than \$100,000. Civil works will use ICB procedures if over \$10 million with exceptions,¹⁶ NCB if \$10 million or less, shopping if less than \$100,000.¹⁷

95. Before the start of any procurement, ADB and the government will review the public procurement laws of the central and state governments to ensure consistency with ADB's Procurement Guidelines (2015, as amended from time to time).

96. All consultants will be recruited according to ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).¹⁸ The terms of reference for all consulting services are detailed in Section D.

97. Construction supervision contracts – A minimum number of packages following ADB consultant recruitment procedures will comprise of road, structures, bridge and water supply engineering inputs and will be contracted using quality- and cost-based selection (QCBS).

98. Output 3 will recruit a Service Provider using QCBS. Annex G provides an over view and detailed description of Output 3 activities.

C. Procurement Plan

99. An 18-month procurement plan indicating threshold and review procedures, goods, works, and consulting service contract packages and national competitive bidding guidelines is in Annex

¹⁶ NCB can be used with OSFMD's prior approval

¹⁷ Master recruitment and procurement bidding documents were prepared during the project preparation for use in implementation.

¹⁸ Checklists for actions required to contract consultants by method available in e-Handbook on Project Implementation at: <http://www.adb.org/documents/handbooks/project-implementation/>

A. The procurement plan has been prepared in accordance with ADB's generic procurement template, and tailored to suit the country specific needs as assessed and presented in the procurement capacity assessment.

D. Consultant's Terms of Reference

100. Detailed terms of reference for all consulting services are in Annex 2. Indicative list of key consultants to be engaged under the project is shown in table 49.

Table 49: Indicative List of Key Consultants to Be Engaged

| No. | Consultants | Fund source |
|------------|-------------------------------------|--------------------|
| 1 | Construction Supervision Consultant | ADB |
| 2 | Loan Implementation Consultant | CF |
| 3 | Audit Consultant | ADB |
| 4 | DED Consultant | ADB & CF |

ADB=Asian Development Bank; CF=counterpart fund

VII. SAFEGUARDS

A. Environment

101. The overall project is classified as **Category B** for environment and all subproject are required to be category B or below. The civil works associated with the road subprojects are limited to upgrading that involve civil works within existing right-of-way (ROW) or newly established ROW. The environmental impacts that will result from this are limited to the construction phase; all impacts will be temporary in nature, with no residual long-term impacts. For the rural water supply schemes and the strengthening of agricultural value chains in Lang Son Province. The project **environmental assessment and review framework (EARF)** and initial environment examinations (IEEs) including environmental management plans (EMP) have been prepared for the representative subprojects including four roads and three water supply schemes in Bac Kan, Cao Bang, Ha Giang and Lang Son, and agricultural and rural value chains in Lang Son, and will be updated and approved by ADB to reflect any changes in the subproject during detail design. These documents will be uploaded on the ADB website before ADB staff review meeting (SRM).

102. The processing of additional subprojects will include an initial environmental examination during the feasibility stage to be contracted and completed by the EAs and IAs. These will be guided by the EARF and are expected to be completed prior to loan signing and or loan effectiveness. Further the detailed engineering design consultant will also be required to provide environmental safeguard input to the design process. The approved EMP will be integrated in the bidding and civil contract documents. Site EMP in detailing mitigation measure implementation in each construction package will be prepared by respective contractor and submitted to PMU for review. Each Province has committed counterpart funding for the implementation of the environmental safeguards identified for the representative subprojects and indicative budgets for the additional subprojects.

103. Each PMU will have an environmental safeguards staff person/focal point who will also be assisted by an environmental safeguards consultant who is intermittent within the loan implementation consultant team. Further the detailed engineering design consultants will also be required to provide environmental safeguard input to the design process. The PMU environment safeguards staff will work closely with environment consultants that form part of the successful detailed engineering design team, and the environmental consultant in the loan implementation consultant team, as well construction supervision consultants for supporting each PMU to assess, monitor and supervise the EMP implementation, and ensure environment compliance in each subproject. Semiannual environment monitoring report, during construction phase, will be prepared and submitted by PMU to ADB for review and uploading on ADB's website.

B. Involuntary Resettlement

104. The overall project is classified as **Category B** for involuntary resettlement. The developments and improvements under the subprojects will not trigger major resettlement impacts because most of the infrastructure will be improved within existing ROWs. An assessment and full census of impacted households along the length of the subproject right of way was conducted, based on the center-line and preliminary designs for the representative roads, and a resettlement framework and resettlement plans were prepared in accordance with national legal requirements and ADB's Safeguard Policy Statement (2009).

105. There were no subprojects with significant involuntary resettlement (IR Cat A) impacts. As

a result, primary points of concern will be minor land acquisition and compensation for roadside trees, crops, or small structures that may be affected within the ROW. The PPCs and ADB have agreed on a combined **resettlement and ethnic minorities development framework (REMDF)**. Minor land acquisition, compensation, allowances, operation and administration, surveys, monitoring, and reporting will be financed from government counterpart funds. The internal monitor will ensure that the resettlement process and impacts is evaluated properly and reported to ADB semi-annually through the EAs.

106. Public consultation and information disclosure was undertaken during the preparation of **resettlement and ethnic minorities development plans (REMDP)**, including affected persons and the public associated with the representative subprojects. The consultation and information-sharing process will be continued throughout project implementation. The main features of the resettlement concerns-project impacts, asset valuation, entitlements, and compensation provisions-were disclosed to project-affected people during consultative meetings.

107. The REMDF has been prepared and will be implemented by the PMUs' who have a social and resettlement staff positions for social safeguard. For the processing of subprojects, both the FS and Detailed Designs will be supported by the requirement for a REMDP and social safeguard input to the detailed design processes. Additional budgets have been included in the Government counterpart contribution for the implementation the requirements of the REMDF.

108. For Output 1 road subprojects and Output 2 water supply subproject the following applies for the representative subprojects (4 road, and 3 water supply) the following has been prepared:

- (i) Engineering preliminary designs established the center lines and right of way for all roads and the alignment of all intakes, pumping and treatment stations and distribution network for the water supply schemes;
- (ii) Based on the engineering survey and cadastral data surveys were conducted to enable the quantification of resettlement impacts and baseline data for the draft REMDPs. They include the inventory of losses to estimate resettlement impacts and a socioeconomic survey to assess pre-project living standards of affected households as well as likely social impacts resulting from land acquisition on them;
- (iii) Public consultations with stakeholders comprising of government entities, private sector interests and affected households. Meaningful consultations will continue during the updating and implementation of the REMDPs during and on completion of the detailed designs and their approval. The draft and updated REMDPs have been disclosed to affected households and their communities based on the preliminary feasibility design documents;
- (iv) The final REMDPs for all representative subprojects are subject to disclosure prior to project approval of the detailed designs. The fundamental objective of the project resettlement policy is to replace and compensate lost assets based on the principle of replacement cost. Compensation and various forms of assistance will be provided. Once land acquisition is completed, income restoration measures will be implemented in a way that will ensure that standards of living of the project affected persons are at least restored to their pre-project levels, and that those in the category of vulnerable groups (i.e., poor households.) are assisted to help improve their socio-economic status;
- (v) The REMDPs will be updated upon loan effectiveness, endorsed by the EAs and submitted to the ADB for review and concurrence. The updated REMDPs will

require further detailed studies (including detailed measurement survey and replacement cost survey) and additional consultation. Principal aspects to be updated in the REMDPs are resettlement impacts based on DMS; census of affected people; entitlement matrix; and replacement costs and details of consultations and disclosure; and

- (vi) The PMUs and/or Center for Land Fund Development (CLFD), the wards/communes, and relevant mass organizations (particularly the Vietnam Women's Union (VWUs)) will have primary responsibility for the updating and implementation of the REMDPs with the support of the consultant. As such the capacity of these bodies is of critical importance and the project must ensure appropriate capacity building assistance in the form of information, training, and consultation and mentoring.

109. For Output 3: initial REMDP and IEEs have been prepared. The implementation arrangement of the output 3 is based on the award of grants to applicants. These applicants will be either enterprises who will be submitting an investment proposal with supporting business plan or producer groups that will be submitting an investment plan with supporting business case. Both groups will need to submit clear safeguards provisions in accordance with the EARF and REMDPF for which support will be provided through the service provider to be contracted and through the LIC and PMU staff.

110. The EAs/IAs and the PMUs will ensure that any involuntary resettlement is carried out in accordance with the agreed REMDPs, ADB's Safeguard Policy Statement (2009), and the Vietnamese laws and regulations on involuntary resettlement. In case of discrepancies between the government's laws, regulations, and procedures, and ADB's Safeguards Policy Statement (2009), ADB' Safeguards Policy Statement will apply.

111. The EAs/IAs and the PMUs will ensure that the REMDPs agreed between the EAs and ADB will be updated following completion of detailed designs based on detailed measurement survey; census of affected people; entitlement matrix; replacement costs and details of consultations and will be submitted to ADB for review and concurrence before awarding bid of civil works.

112. The EA will engage the services of a qualified appraiser to carry out the replacement cost survey for land and non-land assets, and submit the replacement cost survey report to the PPCs and PMUs for review and approval.

113. The PMUs, the wards/communes and relevant mass organizations (particularly the VWUs) will have primary responsibility for the updating and implementation of the REMDPs with the support of the Loan Implementation Consultant.

114. The EAs/IAs and the PMUs shall ensure that a site possession notice to a civil works contract to commence construction activities for a specific section or subproject is issued only when the resettlement specialist of the PMU has officially confirmed in writing that (i) payment has been fully disbursed to the displaced persons and rehabilitation measures are in place for that specific section as per updated REMDPs agreed between the EAs and ADB; (ii) already compensated APs for that specific section have been cleared the area in a timely manner; and (iii) that the specific section is free from any encumbrances.

115. The EAs shall timely and sufficiently provide counterpart funds for land acquisition, resettlement and monitoring activities specified in the agreed REMDPs, and will meet any

unforeseen obligations in excess of the REMDPs budget estimate in order to satisfy resettlement objectives.

116. PMUs are responsible for internal monitoring with assistance from the LICs. PMUs will submit semi-annual internal monitoring reports to ADB. Final monitoring and evaluation need to be conducted after completion of all land acquisition activities every 6 months to assess (i) achievement of land acquisition objectives; (ii) changes in living standards and livelihoods; (iii) restoration of the economic and social base of the affected people; (iv) effectiveness and sustainability of entitlements; and (v) the need for further support as required. Findings monitoring reports will be submitted to ADB and PMU. External resettlement agency is not required for this project because of insignificant impact on land acquisition.

C. Indigenous peoples

117. ADB's Indigenous People's policy requires that under an ADB loan, the borrower/client will undertake meaningful consultation with affected Indigenous Peoples, herein referred to in the Vietnamese context as "Ethnic Minorities" to ensure their informed participation in (i) designing, implementing, and monitoring measures to avoid adverse impacts on them or, when avoidance is not possible, to minimize, mitigate, and compensate for such effects; and (ii) tailoring project benefits that accrue to them in a culturally appropriate manner. Consultation will be carried out in a manner commensurate with the impacts on affected communities. The consultation process and its results are documented and reflected in the REMDF.

118. The overall project is classified as Category B for Ethnic Minorities and all representative and additional subprojects must be Category B. Since, in many cases, ethnic minorities form the overwhelming majority of the population of road subproject areas and since the project is designed to provide positive impacts for these groups, measures to mitigate negative impacts have been incorporated in the subproject REMDPs and the procedures within the REMDF that the PMUs apply in the processing of additional subprojects.

119. Impacts on ethnic minorities in the project areas are overwhelmingly positive since the subprojects will be aimed at the overall economic and social improvement of the total population. The project will not cause physical displacement from traditional or customary lands, nor negatively impact the identity, culture, or customary livelihood system of ethnic minorities. REMDPs will ensure the inclusion of ethnic minorities and their access to project benefits. The REMDP also includes mitigation measures to address impacts on ethnic minorities, an institutional capacity development program, a grievance redress mechanism, and compliance with ADB information disclosure and consultation requirements. Output 3, agricultural value chain subprojects are assessed as category C for involuntary resettlement and indigenous peoples.

120. Internal monitoring and progress reporting will be the responsibility of the PMUs. At the local level, the CSB will monitor on a regular basis.

121. **Prohibited investment activities.** Pursuant to ADB's Safeguard Policy Statement (2009), ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the Safeguard Policy Statement (2009).

D. Road Safety Dimensions

1. Road Safety Objectives and Strategy

122. The improvements in subproject roads to a smoother riding road quality may encourage higher speeds, that may in turn increase rate and severity of crashes on these roads. In some rural areas, the paved roads may also change the road environment, as all vulnerable road users feel less safe with increased traffic speeds. For all subprojects, road safety assessments will be made to minimize rate/severity of crashes over the long-term and to demonstrate good practice road safety interventions to the PMU.

2. Road Safety Action Plan (RSAP)

123. Technical experts from the ADB will provide the following support to improve road safety related to the Output 1 subproject investments:

- (i) will hold training sessions in each of the NEP provinces on incorporating road safety measures into subproject detailed engineering designs, including how to cost such measures. The trainees will include PMU road staff and local design consultants;
- (ii) upon request, will review road subproject detailed engineering designs.

124. The PMUs will work with the Provincial and District Road Safety Committees and related entities at the Commune levels to coordinate and implement associated capacity building activities and to raise local awareness of road safety issues due to road improvements in their communities. Implementation of the RSAP will be overseen by the PMUs. Budget for all non-engineering road safety activities will be through counterpart funding.

125. All roads will at a minimum have appropriate traffic calming and control measures at all schools and kindergartens, health clinics and hospitals, market and high intensity traffic areas and administrative centers.

VIII. GENDER AND SOCIAL DIMENSIONS

A. Gender Objectives and Strategy

126. The project is classified as Effective Gender Mainstreaming (EGM). The objective of the GAP is to reduce inequalities between women and men associated with access to benefits and opportunities and social risks such as exposure to disease and road safety. A gender analysis revealed that women have fewer opportunities than men to participate in public decision making, and less access to information, training, and employment, especially during the low agricultural season. The agricultural value chain subprojects and enterprise values subprojects, are likely to enable women to participate and benefit in the improved economic opportunities associated with agriculture value chains and the road connections to markets. The design features of the GAP are (i) promotion of equality of project benefits and opportunity-sharing between men and women; (ii) reduction in gender inequalities and social risks such as HIV/AIDs transmission prevention, human trafficking prevention and road safety; (iii) training of women, including those from ethnic minorities on technical topics, including tourism service deliveries; (iv) increased representation of women in decision-making bodies and (v) collection of sex-disaggregated data for benefit monitoring and evaluation.

127. A Gender Action Plan has been developed that will also be applied at the subproject implementation level and will be the responsibility of the gender focal point in the PMU with support from a gender consultant in the loan implementation consultant team.

B. Budget and Implementation Arrangements

128. The GAP implementation budget is included in the cost tables for operational costs plus the input from the gender specialist of LIC consultant. The Four Northeastern Provinces Provincial People's Committees (PPCs) will be the EAs and the NEP Departments of Planning and Investment (DPIs) as project owners will be the implementing agencies. The DPIs will implement and monitor the GAP with support from the safeguards social/gender specialist. The PMUs will (i) assign a gender focal point and (ii) will incorporate GAP monitoring in their quarterly progress reports, (using the ADB GAP Progress Report template) to government and ADB. The PMUs will also assign a gender focal point among PMUs staff to be responsible for GAP implementation, monitoring and reporting to ADB.

129. The PMUs will be responsible for implementation of the GAP and will appoint Safeguard Officers with responsibility as gender focal point(s) ensuring annual planning, implementation and monitoring and evaluation (M&E) of the GAPs. The PMUs will recruit national consultants as part of the LIC to provide technical assistance in implementation and M&E and reporting of GAP and related DMF targets. They will support PMUs in preparing GAP for the additional subprojects and for the updating of GAP based on the final approved DED.

130. The PMUs will work with the relevant provincial, district and commune agencies (Viet Nam Women's Union, Agriculture extension agencies, Committee for Ethnic Minority Affairs and NGOs, etc.) to implement and coordinate training, capacity building, and HIV/AIDs awareness raising and road safety activities.

131. Implementation of the GAP will be overseen by each Provincial Steering Committee. Budget for GAP implementation is provided through counterpart funding including training for capacity building and gender activities at subproject level.

Table 50: Gender Action Plan (GAP)

| Strategy | Activities and Targets | Responsibility |
|---|--|---|
| Output 1: Road network connectivity improved | | |
| Enhance women's participation in decision making | <p>T1.1 Participation of community in consultations during subproject DED: 50% are women.</p> <p>A1.1 Consultation meetings held at convenient times and venue for women.</p> <p>A1.2 Women's groups and Union consulted during subproject DED.</p> <p>T1.2 35% of the community monitoring committee' membership is female.</p> <p>A1.3 Community members trained for construction monitoring.</p> | PMUs, design consultant, supervision consultant |
| Economic empowerment for women | <p>A1.4 Equal employment opportunities for female and male unskilled local labor is a provision included in contractors' contract.</p> <p>A1.4 PMUs monitor contractor compliance with gender related labor code (such as equal pay for work of similar value, providing protective gears to workers, no use of child labors, etc.).</p> | PMUs, contractors, construction supervisor |
| Reduction in gender inequalities and social risks | <p>A1.6 Road safety measures: Traffic calming measures provided to all road sections passing schools, markets, medical facilities and administrative centers.</p> <p>T1.4 15 training programs, one for each road subproject, provided to vulnerable road users on each of the road subprojects targeting women and children, with girls accounting for 50% among participants (2016 baseline 0).</p> <p>A1.7 All road safety information and communication will be conducted in a gender sensitive manner and use gender inclusive language.</p> <p>A1.8 Training in a language understandable to EM women.</p> <p>T1.5 Communication campaign facilitators minimum 50% women.</p> <p>A1.9 PMUs and mass organizations will conduct campaign on traffic regulations and safety measures in communes/villages and schools to raise awareness of road safety during construction and operation.</p> <p>A1.10 Prevention of HIV/AIDS and Human Trafficking: awareness delivered to construction worker and community people, especially women of EM groups during civil works.</p> | PMUs, design consultant, contractors, local governments |
| Output 2: Rural water supply improved | | |
| Enhance women's access to benefit, participation in decision making, employment opportunity and | <p>T2.1 10 rural water supply plants will be built and provide water connections to with 49,400 beneficiaries, 50% are female.</p> <p>A.2.1 Women's groups consulted separately during subproject design.</p> <p>T2.3 35% of the community monitoring committees are female.</p> <p>T2.4 Community members trained on construction monitoring.</p> <p>A2.2 PMUs ensure that contractors comply with gender related labor code (such as ensuring equal pay for work of a similar</p> | Contractors / PMUs |

| Strategy | Activities and Targets | Responsibility |
|--|---|------------------|
| reduce social risks | value, providing protective gears to workers, do not use of child labors, conduct HIV/AIDS awareness program for workers, etc.). | |
| Output 3: ARVC infrastructure in Lang Son province improved | | |
| Enhance women's participation in decision making and participation in service delivery | <p>T3.1 Establishment of Horticultural Sector Industry Organization, in which Composition of the HortLangSon board must include at least 35% women members.</p> <p>T3.2 Five commodity associations with supporting market and quality assurance systems (at least 40% female membership).</p> <p>T3.3 Technical training provided to at least 100 women in the Producer Groups and HortLangSon.</p> <p>T3.5 Women's membership of Product Groups at least 50%.</p> <p>T3.6 HortLangSon staffing compliment must include a minimum of at least 40% of women employees by end of the project.</p> <p>T3.7 Field service delivery units have 40% of female staff.</p> <p>A3.1 All related field services staff completed orientation training on (i) women and their agricultural and business roles; (ii) methods of working with ethnic minorities; and (iii) methods of working with people who have low literacy and numeracy.</p> <p>T3.8 30 enterprises receiving matching grants for value addition (at least 10% female headed enterprises¹⁹).</p> | HortLangSon, PMU |
| Enhance Women's economic benefit and decision making | <p>T3.9 Producer group infrastructure packages for 80 market linked groups with at least 50% female membership in these groups, which include support for time saving infrastructures and /or time saving production technology.</p> <p>T3.10 30 producer group's grants for value addition with at least 30% of the groups leadership women.</p> <p>T3.11 50% of leaderships positions of the farmer groups of star anise and vegetable groups are female.</p> | HortLangSon, PMU |
| Capacity building for gender mainstreaming | | |
| | <p>T4.1 PMUs comprise of at least 20% female members among staff.</p> <p>A4.1 GAP briefing to PMU relevant staffs (gender focal point, procurement, resettlement and safeguards, M&E, etc.)</p> <p>A4.2 Project M&E include sex-disaggregated data collection and analysis for GAP and DMF gender related target.</p> <p>A4.3 GAP consultant recruited to support GAP implementation.</p> <p>A4.4 Gender focal point in PMUs support GAP implementation.</p> <p>A4.5 Marketing/technical or impact studies will be conducted taking gender perspective into consideration.</p> | PMUs |

A = activity, DED = detailed design, DMF = design monitoring framework, EM = ethnic minority, GAP = gender action plan, M&E = monitoring and evaluation, PMU = project management unit, T = target

¹⁹ Female headed enterprises are the enterprises of which the final decision making on transition is led by a woman. Female headed households are the one in which women are the income earners.

IX. PERFORMANCE MONITORING, EVALUATION, REPORTING, AND COMMUNICATION

A. Project Design and Monitoring Framework

| Impacts the Project is Aligned with | | | |
|---|---|--|---|
| Subregional competitiveness of the four northeastern provinces enhanced. (<i>Overall Development Plan of Mountainous Northeastern Provinces of Viet Nam to 2020, and National Target Program on new rural development for 2016-2020</i>) ^a | | | |
| Results Chain | Performance Indicators with Targets and Baselines | Data Sources and Reporting Mechanisms | Risks |
| <p>Outcome Production, service delivery, and movement of goods and passengers sustainably increased</p> | <p>By 2024:</p> <p>a. average annual increase of 5% in passenger car units and movement of goods 10% in ton-km on improved roads (2016 baseline: 468,612 passenger car units and 16.9 ton-km)</p> <p>b. About 44 communities within 2 km of the developed transport network (2016 baseline: 0 commune)</p> <p>c. About 22 communes have year-round reliable access to clean water (2016 baseline: 0)</p> <p>d. Incremental increase in value chain margins by Đ 180 million per ha for star anise in three communes (2016 baseline: Đ 360 million per ha)</p> <p>e. Asset management data to support O&M for provincially owned road and irrigation infrastructure integrated into annual provincial reports and development plans (2016 baseline: 0)</p> | <p>a.–b. PPMS, government and public transport operator statistics, additional subproject feasibility reports</p> <p>c. PPMS, provincial people’s committee annual reports</p> <p>d. PPMS, district agriculture statistics</p> <p>e. Provincial annual reports and development plans</p> | <p>Premature asset deterioration due to: inadequate O&M, and, or climate change impacts</p> <p>Cost escalation and reduction in overall project scope due to delays caused by counterpart funding not available as required</p> |
| <p>Outputs 1. Road network connectivity improved</p> | <p>By 2023:</p> <p>1a. About 121 km of provincial and 144 km of district roads improved (2016 baseline: 0 km)</p> <p>1b. About 44 traffic calming measures provided to all road sections passing schools, markets, medical facilities, and administrative centers (2016 baseline: 0 measures)</p> <p>1c. About 13 training programs, one for each road subproject, provided to vulnerable road users on each of the</p> | <p>1a.–1c. PPMS</p> | <p>Premature road deterioration due to narrow application of official Vietnamese traffic forecasting system and under-designed roads.</p> |

| Results Chain | Performance Indicators with Targets and Baselines | Data Sources and Reporting Mechanisms | Risks |
|---|--|---------------------------------------|--|
| | road subprojects, of whom female users account for 50% of trainees (2016 baseline: 0 measures and training) | | |
| 2. Rural water supply improved | By 2023: 2a. About ten rural domestic water supply schemes comprising approximately a total of 414 km of pipes laid (2016 baseline: 0 commune) | 2a. PPMS and QPR | Water resources for RDWS impacted due to climate change droughts and floods Subproject service standards and scope reduced due to weak financial management including user cost recovery systems. |
| 3. Agriculture and rural value chain infrastructure in Lang Son province improved | By 2023: 3a. Horticulture Lang Son Marketing and Trade Access Association for horticultural commodity groups formed with five commodity associations with proven market demand as members (2016 baseline: 0) 3b. About 80 packages of market support for producer group infrastructure implemented (at least 50% female membership) (2016 baseline: 0) 3c. About 30 enterprises receive matching grants for value addition and quality control standards with at least 10% of enterprises headed by women ^b (2016 baseline: 0) | 3a.–c. PPMS and QPR | ARVC development hampered by the enforcement of outdated government regulations. |
| 4. Decentralized public asset management processes established | By 2023: 4a. Asset planning systems producing maintenance management information, including budget needs and timelines, operational in each province (2016 baseline: 0) 4b. Water supply asset management planning with supporting databases for business management reporting for 10 rural domestic water supply schemes established (2016 baseline: 0) | 4a.–c. PPMS and QPR | Weak financial management and procurement systems hamper effective asset management. |

| Results Chain | Performance Indicators with Targets and Baselines | Data Sources and Reporting Mechanisms | Risks |
|---|---|---------------------------------------|-------|
| | 4c. Decentralized irrigation infrastructure asset planning systems producing management information on maintenance budget needs extended into Ha Giang, Bac Kan, and Cao Bang using the Asian Development Bank-supported Ministry of Finance model (2016 baseline: 0) | | |
| <p>Key Activities with Milestones^e</p> <p>1. Road network connectivity improved</p> <p>1.1 Prepare feasibility study for additional subprojects by April 2018 (PSD)</p> <p>1.2 Award works contracts for representative subproject by March 2019 (PSD)</p> <p>1.3 Award works contracts for priority additional subprojects by December 2019 (PSD)</p> <p>1.4 Prepare additional subproject detailed design (to use remaining funds) by June 2020 (PSD)</p> <p>1.5 Award works contracts for final additional subprojects by December 2020 (PSD)</p> <p>1.6 Complete construction works by December 2022 (PSD)</p> <p>2. Rural water supply improved</p> <p>2.1 Prepare feasibility study for remaining water supply subprojects by April 2018 (PSD)</p> <p>2.2 Award works contracts for representative subproject by March 2019 (PSD)</p> <p>2.3 Award works contracts for priority additional subprojects by December 2019 (PSD)</p> <p>2.4 Additional subproject detailed design (to use remaining funds) by June 2020 (PSD)</p> <p>2.5 Award works contracts for final additional subprojects by December 2020 (PSD)</p> <p>2.6 Establish water supply operation and maintenance capability by June 2022 (PSD)</p> <p>2.7 Complete construction works by December 2022 (PSD)</p> <p>3. Agriculture and rural value chain infrastructure in Lang Son province improved</p> <p>3.1 Sign contract with value chain service provider for market, trade access, and value chain integration by June 2018</p> <p>3.2 Establish the Horticulture Lang Son Marketing and Trade Access Association board by June 2018 and operational strategic business plan by December 2018 (PSD)</p> <p>3.3 Complete key commodities of safe vegetable and star anise marketing and trade studies by December 2018 (PSD)</p> <p>3.4 Establish commodity associations by December 2018 (PSD)</p> <p>3.5 Establish producer group business plans with infrastructure needs, and submit to HORTLANG SON to review and fund by January 2019 (PSD)</p> <p>3.6 Advertise and award enterprise value addition grants starting October 2018 (PSD)</p> <p>3.7 Train women's groups in agriculture and rural product value addition by March 2022 (PAR)</p> <p>4. Decentralized public asset management processes established</p> <p>4.1 Implement road network asset planning systems by September 2022 (GCD)</p> <p>4.2 Implement rural water supply asset planning by September 2022 (GCD)</p> <p>4.3 Extend decentralized irrigation asset management by September 2022 (GCD)</p> | | | |
| <p>Project Management Activities</p> <p>Establish coordinating office and provincial project management units by December 2017.</p> <p>Complete recruitment of loan implementation consultants by May 2018.</p> <p>PPMS functioning within 30 days of loan effectiveness.</p> | | | |
| <p>Inputs:</p> <p>Asian Development Bank: \$150 million concessional loan - ordinary capital resources</p> <p>Government of Viet Nam: \$40.3 million</p> | | | |
| <p>Assumptions for Partner Financing</p> <p>Not applicable</p> | | | |

ARVC = agriculture and rural value chains, GCD = government capacity development, ha = hectare, km = kilometer, PAR = partnerships, PPMS = project performance monitoring system, PSD = private sector development, QPR = quarterly progress report, RSP = representative subproject, VND = Viet Nam Dong.

^a Government of Viet Nam. 2015. *Overall Development Plan of Mountainous Northeastern Provinces of Viet Nam to 2020*. Hanoi.; Government of Viet Nam. 2016. *Decision 1600/QD-TTg approving the National Target Program on new rural development for 2016-2020*. Hanoi.

^b In enterprises headed by women, the final decision is led by a woman. Households headed by women are households in which women are the main income earners.

Source: Asian Development Bank.

B. Monitoring

1. Project performance monitoring.

132. Project progress and performance will be based on the indicators and targets shown in the DMF. Five kinds of monitoring will be carried out including: (i) implementation progress monitoring; (ii) safeguard monitoring; (iii) benefit monitoring and evaluation; (iv) GAP monitoring; and (v) loan agreement covenant monitoring.

133. **Implementation progress monitoring** will be one of the main tasks of each PMU that will be supported by each PMU monitoring and evaluation specialist and will be based on the detailed work planning schedules – see Annex 4 for the proposed subproject and project management work planning template and the overall project implementation schedule. Collectively these will be consolidated into a provincial EA and Project-wide provincial project performance monitoring system (PPMS).

134. The PPMS will be managed by the PMU who will maintain it and report updated progress on a quarterly basis. The consolidated project PPMS will be managed by the BIIG1 Coordination Unit attached to the Lang Son Province.

135. The PPMS will monitor the progress of activities in the province. To augment information collected during the PPTA and the subproject feasibility studies will provide a baseline dataset for each subproject that will define (i) activities, (ii) the implementation timelines and milestones, (iii) outputs delivery progress, (iv) final output, and (v) contribution of each subproject output to the outcome indicators. The PPMS will not directly assess the contribution to the project impact. PPMS monitoring activities will entail periodic monitoring of the benefits and impacts of a representative number of selected subprojects as reported in quarterly reports. This will be undertaken by each PPC-PMU monitoring and evaluation staff member.

136. Each subproject will have a completion report prepared by the construction supervision consultant that will include details of (i) output completed, (ii) output still in progress, (iii) road user data and forecasts based on traffic counts after road completion and within 6 months of Project completion and the conversion of this data into PCU with a comparative assessment of measured PCU's and the those projected at subproject design and feasibility approval. For Water supply the number of connections, sale of water data will also be compared to design forecasts. The PMU staff will collate this into provincial level reports and the BIIG1 coordination unit will consolidate these into an overall Project Performance data base and reporting system that can be used for post evaluation purposes.

2. Compliance monitoring.

137. The government and EAs have agreed with ADB on certain covenants for the project, which are set forth in the loan agreement including the following:

- (i) The government will ensure that adequate funds are allocated for the periodic

- maintenance of infrastructure developed under the project through provincial budgets to maintain the infrastructure in functional order; and
- (ii) The government will ensure that a grievance redress mechanism established in RPs/REMDPs for affected people in the participating districts will be implemented effectively and satisfactorily.

138. ADB will monitor compliance with all covenants throughout implementation via regular review missions, quarterly progress reports submitted by the PMUs through the Secretariat, and review of project accounts and procurement procedures.

139. Safeguards monitoring. Safeguards monitoring with associated grievance redress mechanisms will be developed to ensure that the required policies, procedures and plans for: (i) resettlement including land acquisition and compensation; (ii) ethnic minority specific actions are implemented and achieve their expected outcomes during subproject preparation, implementation and operation; and (iii) EMP plan implementation.

3. Gender and social dimensions monitoring.

140. PMUs will monitor and report on GAP implementation to ADB regularly. Data will be disaggregated by sex and where sensible²⁰ ethnic minorities. Routine monitoring by the Project will focus on assessing progress against GAP activities and targets, identifying constraints and developing remedial actions to effectively address these. Monitoring results will be included in at least every second quarterly progress reports, and assessment/evaluations of the GAP will be an essential element of all reviews.

4. Road Safety Monitoring

141. The implementation of the road safety awareness plan and the implementation of the measures will be reported in the quarterly progress reports.

C. Evaluation

142. ADB will conduct regular (at least twice per year) reviews throughout implementation of the project to assess implementation performance and achievement of outcomes and objectives, examine financial progress, and identify issues and constraints affecting the project and work out time-bound action plans for their resolution.

143. A midterm review will also be undertaken after 18 months from loan effectiveness. This review will include a comprehensive evaluation of project implementation arrangements, detailed evaluation of the scope and implementation process and progress of subprojects, feedback from the PPMS, performance of consultants, and possible reallocation of loan proceeds. During this more significant review, the effectiveness of project management arrangements will be a priority with remedial action will be instituted as required.

144. Within 12 months of physical completion of the project, ADB will conduct a project completion mission to carry out a preliminary assessment of the success of the Project to achieve its physical, and socio-economic developmental objectives, as well as to review compliance with ADB requirements and loan covenants.

²⁰ Where ethnic minorities account for more than 85% of the population the need to disaggregated is significantly reduced

D. Reporting

1. Provincial Work Planning and Reporting

145. Reporting will be directly linked to the physical implementation progress of project annual work plans, budgets and forecasts of contract awards and disbursements. Work planning will be developed by each PMU no later than 45 days prior to the end of the fiscal year with a mid-year update no later than 30 days after mid-year. The work plans will be developed for each individual subproject with the first annual work plan within 45 days of Project start up. Draft work plans will be developed prior to loan signing to enable preparation of advances to be planned and approved. A draft structure for subproject physical planning is included in Annex 2 and will be linked into the ADB (Viet Nam Resident Mission PDIP excel work book) after loan negotiations. The individual subproject work plans will be consolidated and linked to the budgets for ADB and Government Funds in separate projections. Both the work plan and projections will be based on a life of project approach with progress reported against these and modifications and adaptation to plans made on an as needed basis but no less than six monthly. The Project Director is solely responsible for ensuring work plans and forecast are developed and maintained on this time line.

146. In addition to the subproject work plan each PMU will also derived a project procurement and contract award schedule. The information for this schedule will be derived from the subproject workplan schedule and will develop a procurement and contract award reporting worksheet that clearly identifies progress against plans and highlights on a quarterly basis any deviation from planned schedule timelines where the deviation exceeds one month and formal PMU statement on the cause and management response to address the delay is required.

147. The PMU Project Director will also ensure that the overall progress of the project implementation and management are clearly scheduled including activities such as Safeguard monitoring reports, compliance reporting, land acquisition and compensation achievement and the achievement of outputs and how these are contributing to the project DMF indicators – see Table 50 below. As such this will require each PMU to establish a Project Performance Management System that disaggregates technical, social and financial data within each subproject and captures (i) baselines data from the feasibility study surveys, (ii) data on technical, safeguards and social from the detailed design stage, (iii) subproject outputs and the effects on the number of beneficiaries, the nature of impacts etc. The different outputs require significantly different data sets that will need to be stored and accessible to the PMU for project completion reporting as well as implementation reporting. An indicative table of contents for the progress report is provided in Annex E.

2. Project Level Work Planning and Reporting

148. As coordinating **Province the Lang Son DPI/PMU** will provide ADB with (i) quarterly progress reports in a format consistent with ADB's project performance reporting system; (ii) consolidated annual reports including (a) progress achieved by output as measured through the indicator's performance targets, (b) key implementation issues and solutions, (c) updated procurement plan, and (d) updated implementation plan for the next 12 months; and (iii) a project completion report within 6 months of physical completion of the project. To ensure that projects will continue to be both viable and sustainable, project accounts and the executing agency audited financial statement together with the associated auditor's report, should be adequately reviewed.

149. Each Provincial DPI/PMU will ensure that the required information and milestones are achieved through a Memorandum of Understanding agreed between the four EA's that details the annual timing for the preparation and Provincial approval of:

- (i) Each Province annual implementation and work plans presented by subproject, output and for the overall province, including
 - a. supporting annual budgets in the form of financial forecasts that define budget and cashflow requirements by source of funding;
 - b. annual projection of contract awards; and
 - c. projected disbursements.

- (ii) Timing of a joint provincial project performance and planning meeting supported by the BIIG1 co-ordination unit in Lang Son that presents:
 - a. A review of progress and achievement in the past year;
 - b. An updated status of subproject preparatory work for submission to ADB and PPC for approvals;
 - c. An updated procurement and contracting status;
 - d. An updated implementation program for the following year including carry over activities that were not completed;
 - e. Revised budget and financial projections by subproject, financial cashflows;
 - f. Revised contract award and disbursement projections;
 - g. The preparation of a consolidated work plan and financial projection for ADB 8 weeks prior to the end of each Project year Timing of a joint provincial project performance and planning meeting every three-month planning update meeting within one month of the mid-year point that:
 - i. Review the consolidated quarterly report prepared by the BIIG1 coordination report;
 - ii. Identifies outstanding implementation issues and challenges;
 - iii. Identifies issues or bottlenecks that need to be addressed within or across the provinces;
 - iv. Prepares a report for ADB and the respective PPCs.

Table 51: Progress reporting linkages to DMF indicators

| Project Design and Monitoring Framework | | Progress Report Input | | | |
|--|--|--|---|--|--|
| Outcome | By 2023 | Output 1: Subproject Monitoring | Output 2: Subproject Monitoring | Output 3: Monitoring | Output 4: Monitoring |
| | | Data as Project completion with updated projections through 2030 | | | |
| Increased production, and movement of goods and passengers within the FNEP and to major markets. | a. 5% increase in average annual passenger car units on improved roads (2016 baseline: 468,612) | PCU based on updated traffic count on completion and at Project completion | | | |
| | b. 10% increase in ton-km transported on improved roads (2016 baseline: 16.9 mill) | Updated truck and freight base don actual and comparative assesment design vs completion | | | |
| | c. Annual vehicle-km increase from 59mill/yr to 132.8mill/yr | Updated traffic forecast with actual and comparative assesment of design vs project completion | | | |
| | d. 49,000 people in 23 commune with access to safe water by 2030 (2016 baseline: 0) | | Number of HH and residents with connections at subproject and project completion, with revised forecast connections throgh 2030 | | |
| | e. Increase in trade volumes in agricultural commodities of 10% star Anise and 50% safe vegetable b (2016 baseline: 9,000t dried fruit star anise, nil t safe vegetable) | | | Producer group data updated, commodity association data and Official Statistics at project completion and forecast to 2030 | |
| | f. Increase in crop gross margin income by 50% for commodities included project (2016 baseline: vegetable € 10 mill/ha, Star anise € 12.8 million per ha) | | | Producer group member with grants gross margin comparison between business plan and actual on completion, comparison of both these points with FS in PPTA | |
| | g. Increase in Value chain margins by 50% - star anise baseline € 360 million per ha 2016) | | | Basd on gross margins assesment and commodity value chains assesmethn compared with PPTA baseline | |
| Outputs | By 2023 | | | | |
| 1. Improved FNEP road network connectivity | 1a. 276.5 km of provincial and district roads improved by 2023 (2016 baseline: 00km) | Km of road upgraded by subproject and province - taken from completion report and handover of assets | | | |
| 2. Improved rural water supply | (2016 baseline: 00 communes) | | | | |
| | 2a. 23 communes (including 19,908 households and 29,405 beneficiaries) have year round access to clean water by 2023 | | Number of hh and residents with year round access to clean water to house vvia project networks | | |
| | 2b. 10 Rural water supply scheme operators functioning with local water user committees comprising 50% women by 2023 | | Number of project water supply schemes with local (commune and township) water user committees with 50% female members | | |
| 3. Improved agriculture and rural value chain infrastructure in Lang Son province | (2016 baseline: 0) | | | | |
| | 3a. Marketing and Trade Access Association for horticultural commodity groups with proven and market demand formed with 5 horticultural commodities members by 2022 | | | Number of Horticultural tradea association commodity group members with market assesments by project completion | |
| | 3b. Producer group infrastructure packages for 80 market linked groups (at least 50% female membership) | | | Number of Producer group recieveing block grants - and the number of producer groups receiving block grants with more than 50% registered members female - (from registration records) | |
| | 3c. 30 Enterprise grants for value addition and quality control standards (at least 10% female headed enterprises) | | | Number of enterprise grants to value chain /market assesments and the number of enterprises with more than 50% registered members/shareholders being female | |
| | 3d. Five commodity associations with supporting market and quality assurance systems (at least 50% female membership) | | | Commodity associations formed by HortLang Son with market and quality Assurance systems and at least 50% female membership | |
| 4. Infrastructure assets life cycle processes functioning | (2016 baseline: 0) | | | | |
| | 4a. Asset Planning system for road infrastructure established and populated in four provinces. | | | | Number of provinces with road life cycle asset managenet systems installed and functioning |
| | 4b. Water supply asset planning with supporting databases for business management reporting for 10 water supply schemes | | | | Number of project water supply schemes per province with water asset life cycle management systems linked to business mangmetn reports |

E. Stakeholder Communication Strategy

1. Consultation

150. The project is designed to improve the welfare of rural inhabitants in the four Project Provinces through a series of investments aimed to improve transport, socio-economic wellbeing and agricultural value chains.

151. Project preparation has been conducted with stakeholder agencies in the government at national, provincial and district levels including MPI, MOF, SBV and MONRE. Meetings have also been held in the participating provinces with DPI, DOT, DARD, DOIT and DOF officials, focusing on management arrangements and issues. Requirements for ensuring appropriate levels of consultation for subproject preparation and implementation have been reviewed and confirmed.

152. Representative subproject preparation included consultation requirements involving documented evidence of inclusive consultation with all communities in the subproject area and participant information on numbers of women and men by ethnic minority. Subproject socio-economic/gender surveys that identify vulnerable groups to provide a basis for specific consultation and participation mechanisms will be followed during implementation.

153. During implementation, the process of consultation will continue throughout the process for preparing and approving FS for additional subprojects and the follow on detailed engineering designs for each subproject. The consultation seeks to provide community groups the opportunity to voice their views on how the subproject is to be designed, implemented and operated. In addition, associated initiatives will be built into the design of each subproject to enhance the inclusiveness of the project activities from the perspective of social and economic integration of less well-off communities.

2. Participation

154. It is anticipated that the community will be mobilized in a number of different ways during subproject design, implementation and operation. During subproject design and preparation stages, community participation will consist primarily of their contribution through the consultation process, field survey and focus group discussions and direct consultation. During construction, there will be significant opportunities for active participation, particularly for the poor households who will benefit from the subproject through opportunities to participate in paid employment for unskilled workers and through the linkages to producers to value chain enterprises and markets. This will be encouraged through (i) the bidding documents which will require contractors to investigate the option of local employment whenever possible, and (ii) through the terms of reference for the value chain service provider, the criteria for accessing producer group and enterprise grants.

3. Awareness

155. Information about the project and the subprojects in particular, including the objectives, potential environmental impact, implementation arrangements, resettlement and compensation matters, gender issues, issues of concerns for ethnic minorities will be provided to beneficiaries. Information will be provided through village meetings, pamphlets, and other announcements in both Vietnamese language and the language(s) of the communities whenever appropriate. The community will be fully informed of issues such as their right to participate in the subprojects and to be compensated for any loss of property including productive land and/or assets as well as

gender equity and other relevant policies. Separate meetings and discussions will be arranged with the people who are directly affected by land acquisition and/or resettlement issues. The community and particularly the affected households will be provided with detailed guidance and procedures regarding resettlement and compensation.

156. For output 3 an outreach and information capability will be developed for HortLangSon to be delivered to (i) stakeholder in the representative value chains for star anise and safe vegetables, (ii) to horticultural producers and commodity associations, and (iii) agents and trader, (iv) post-harvest enterprises and logistic operators, (v) service providers, and (vi) market buyers. Specific program will be developed for each target group with the aim of building the linkages along the value chain and across producers for product aggregation necessary to gain access to project resources.

157. An example of a subproject communication plan is incorporated in the table 52.

Table 52: Example of a Subproject Communication Strategy

| Objective | Key Risks Challenges | Stakeholder Group | Messages | Means of Communication | Timeline | Responsibility | Resources |
|---|--|--|--|--|--|--|---|
| Disseminate information on project design, key impacts anticipated as well as any mitigation measures, to project APs and beneficiaries | Language/Culture Literacy Managing expectations, including that of establishment of farmer groups Reach of information, especially in isolated, remote areas Lack of confidence in local authorities | Subproject APs Community members (men & women in communes/villages) Women headed HH Poor HH, ethnic minority HH | Subproject design, key benefits, implementation arrangements and schedule of infrastructure investment for value chains development Main impacts of subproject (positive and negative) through disclosure Planned mitigation measures, especially for female APs (including compensation rates, entitlements, grievance redress mechanism) | Public information meetings Resettlement committee meetings in affected areas Printed information in language with simply sentences in order to easily understanding for EM and posted in accessible public areas Gender-sensitive IEC campaign, including community-level training and public media campaign Meetings, consultations and other interactions between PMUs/communities/farmer groups in the subproject area's service zones | Ongoing prior to implementation of activities Early in each phase of subproject preparation Subproject detailed design Ongoing during civil works Post evaluation after project completion | Primary: PMUs Contractors/subcontractors for civil works Local authorities at commune-, ward-, city- and district-level (CPCs, and DPCs) and VWU Secondary: PPCs DPI DARD | Costs will be covered in part by the RPs, GAPs as well as basic project implementation budgets under PMU Incremental Cost and Construction Supervision Contract Resettlement Specialist WSC/PMU Social Development & Safeguards Specialists Compensation and Resettlement Committees (CRCs) Community Supervision Boards (CSBs) |
| Deliver information on labor | Language/Culture Literacy and low | Community members as well | Opportunities for appropriate skills training/upgrading | Public information meetings Printed information | Early in each phase of | Primary: PMUs WSCs | Costs will be covered in part by the |

| Objective | Key Risks Challenges | Stakeholder Group | Messages | Means of Communication | Timeline | Responsibility | Resources |
|--|--|---|--|---|---|--|--|
| opportunities and good labor practices | levels of awareness | as outsiders hired as semi-skilled and skilled construction workers, community mobilizers and IEC campaign facilitators in subproject areas Contractors/subcontractors for civil works | during period of hire, with quotas reserved for women (GAP) Core labor standards, including no forced labor and child labor Gender parity in work related compensation, i.e., equal pay for equal work, for women and men, and the right to separate living & toilet facilities at work sites Schedule of civil works Labor safety regulations Risks and prevention of HIV/AIDS transmission and Human Trafficking | in local language(s) and language(s) of migrant workers (on pamphlets and billboards), posted in accessible public areas, especially at or near construction sites IEC campaign for HIV/AIDs and Human Trafficking, including community-level training and public media campaign | sub project preparation Ongoing during civil works and conduct of IEC campaigns | Local authorities at commune-, ward-, city- and district-level VWU CHCs DPI Secondary: PPCs DOLISA | GAPs as well as basic project implementation budgets under PMU Incremental Cost and Construction Supervision Contract PMU Social Development & Safeguards Specialists CSBs Community health workers Health NGOs |
| Highlight responsibility of | Lack of political willingness to implement | PPCs, HortLangSon DOLISA | Basic project design, anticipated impacts | HortLangSon meetings with relevant local | From outset of the project | DPI HortLangSon DPC and CPC | Costs will be covered by the GAP and |

| Objective | Key Risks Challenges | Stakeholder Group | Messages | Means of Communication | Timeline | Responsibility | Resources |
|--|--|---|--|---|----------------------------|---|---|
| provincial government agencies in enabling access of disadvantaged groups to value chains | decrees and decisions Provincial budget constraints | PCs at other administrative levels in provinces, i.e., local authorities – DPCs, CPCs and village leaders | and any planned mitigation and grievance redress measures as they apply to APs, beneficiary groups other stakeholders along value chains related to poor and women headed HHs, and other vulnerable groups (including EMs, disabled, etc.), in accordance with Decrees 117 & 124 | authorities and government agencies authorities, attended by officials at the appropriate level | | VWUs at all levels | basic project implementation budgets under PMU Incremental Cost and Construction Supervision Contract HortLangSon management PMU Director PMU Social Development & Safeguards Specialists |
| Inform Provincial stakeholders about project design and entry points for their participation – community mobilization, IEC, and ensuring women's access to all project | Lack of sectoral capacity Relative lack of resources and decision making authority compared to other departments and agencies, | Vietnam Women's Union (VWU) | Basic project design and anticipated impacts, as they matter to women Disseminate information on improved HH water management, sanitation and hygiene to communities in collaboration with Community Health Centers. | Public information meetings IEC campaign (including materials) to raise awareness on links between gender and WASH issues Training materials integrating gender | From outset of the project | VWU Local authorities at commune-, ward-, city- and district-level CHCs | Costs will be covered by the GAP budget □ PMU Director PMU Social Development & Safeguards Specialists CSBs Community health workers |

| Objective | Key Risks Challenges | Stakeholder Group | Messages | Means of Communication | Timeline | Responsibility | Resources |
|---|--|--|---|---|--|---|---|
| benefits | | | | | | | |
| Inform network of Community Health Centers in project areas about project design and the role they are expected to play in disseminating information on improved WASH as well as HIV/AIDS causes & prevention | Relative lack of resources and decision making authority compared to other departments and agencies, including WSCs | Community Health Centers (and community health workers), Department of Health | Disseminate information on health benefits of improved water supply, sanitation and hygiene to communities in collaboration with VWC Design and propagate training module about HIV/AIDS | Public information meetings, IEC sanitation and hygiene awareness materials, including community based training and public media campaign HIV/AIDS training module | Early in each phase of sub project preparation Ongoing during civil works and conduct of IEC campaigns | VWU PMUs WSCs Local authorities at commune-, ward-, city- and district-level CHCs | Costs will be covered by the project implementation budget (social development) □ PMU Social Development & Safeguards Specialists CSBs Community health workers |
| Promote community involvement in resettlement and project monitoring | Identifying valid community representatives Newly formed, slow to build up capacity required Functions vaguely defined | Community Supervision Boards (CSBs) Compensation and Resettlement Committees (CRCs) For Output 3 – monitoring will be the Farmer Groups | Information on resettlement areas, affected households, resettlement plan and compensation policies Core labor standards integrating gender concerns and labor safety regulations Special | Meetings between WSCs/PMUs and CSBs and CRCs Public information meetings presided over by CSBs or CRCs Direct interactions between affected HHs and CSBs or CRCs Printed information in local | Early in each phase of sub project preparation Ongoing during civil works and conduct of IEC campaign | VWU PMUs WSCs Local authorities at commune-, ward-, city- and district-level HortLangSon has a monitoring role too see 3.1.9... | Costs will be covered by the GAPs and basic project implementation (social development component) budgets PMU Social Development & Safeguards Specialists |

| Objective | Key Risks Challenges | Stakeholder Group | Messages | Means of Communication | Timeline | Responsibility | Resources |
|---|---|---|--|---|---|---|--|
| | | | consideration of community members from poor and/or women-headed HHs in all aspects of the project Risks and prevention of HIV/AIDS transmission and Human Trafficking | language(s) posted in accessible public areas Gender-sensitive IEC campaign, including community-level training and public media campaign | s | in Output 3 matrix | CSBs Community health workers |
| Ensure understanding of HIV/AIDS transmission and Human Trafficking risks, and prevention measures for both | Language/Culture Literacy and low levels of awareness | Communities in or near project area construction sites Workers on construction site | Key risks and mitigation measures of HIV/AIDS transmission and Human Trafficking | Public information meetings Printed information in local language(s) and language(s) of migrant workers (on pamphlets and billboards), posted in accessible public areas, especially at or near construction sites IEC campaign for HIV/AIDs and Human Trafficking, including community-level | Prior to commencement of civil works and throughout civil works | PMUs VWU CHCs Civil works contractors/subcontractors | Costs will be covered in part by the GAPs as well as basic project implementation budgets PMU Social Development & Safeguards Specialists CSBs Community health workers Local NGOs with a health focus |

| Objective | Key Risks Challenges | Stakeholder Group | Messages | Means of Communication | Timeline | Responsibility | Resources |
|---|--|---|---|---|--|---|--|
| | | | | training and public media campaign | | | |
| Strengthen business processes and institutions, integrating gender issues | Inertia to change; tendency to maintain institutional and socioeconomic status quo | All HortLangSon and PMU staff, especially women in executive and the service provider units VWU members at all levels within the province | Reasons why profit generation, user cost recovery and tariff roadmap are core principles of business viability Negotiate sharing of capital costs and underwriting of any subsidies to farmer groups with state agencies (PCs and DOLISA) Opportunities for training, exposure visits, with quotas reserved for female staff and VWU members to learn more about the sector Gender parity in work related access the fund grants for farmer groups | Farmer group meetings and meetings with other value chain members Printed information in local language posted in accessible public areas Training workshops and exposure visits to raise awareness about benefits of community participation in all aspects of project planning, implementation, and M&E Business, marketing and technical training workshops Training materials to promote gender sensitivity Routine consultation with district and | From outset of each subproject Ongoing prior to implementation of activities Early in each phase of subproject preparation At project detailed design Ongoing during civil works | HortLangSon DPI PPCs DPC and agencies PMUs CPC VWUs | Costs will be covered in part by the GAPS and project implementation budgets PMU Director PMU Social Development & Safeguards Specialists Staff welfare committees of HortLangSon |

| Objective | Key Risks Challenges | Stakeholder Group | Messages | Means of Communication | Timeline | Responsibility | Resources |
|-----------|----------------------|-------------------|----------|--|----------|----------------|-----------|
| | | | | <p>commune agencies, including VWUs, on gender-related matters relevant to project outputs</p> <p>Routine consultations between HortLangSon management and women employees, in executive and service provider units about professional issues that matter to them, and gender issues arising from implementation</p> | | | |

ADB - Asian Development Bank; PMU –Projects Management Board; APs – Affected Persons; CSB – Community Supervision Board; CPC – Commune Peoples Committee; CVWU – Commune Women’s Union; DARD – Department of Agriculture & Rural Development; DOC – Department of Construction; DONRE – Department of Natural Resources & Environment; DOT – Department of Transport; DPI – Department of Plan and Investment DRCs – District Resettlement Committees; GAP – Gender Action Plan; IAs – Implementing Agencies; IPP – Indigenous Peoples Plan; PP – Project Proposal; O & M – Operation & Maintenance; PPC – Provincial peoples Committee; of RIs –Rural Infrastructure; RP – Resettlement Plan; VWU – Viet Nam Women’s Union

Table 53: Consultation and Participation Plan

| Topics/Subjects | Stakeholder Group | Why They are Included | Type of Participation | | Participation Methods | |
|------------------------|--|---|--|---|-----------------------|---|
| | | | | Methods | Responsibility | Time line Cost |
| REMDP | Women, poor and vulnerable households, ethnic minority groups near project sites. | Representing interests of women and ethnic groups. | Information sharing (M), Collaboration (M) | <p>Separate meetings with ethnic groups in local language and ii) meetings with women organized through VWU.</p> <p>Printed information about infrastructure and training programs available in local and accessible language (or visual depictions) posted in accessible public areas.</p> <p>Designation and provision of materials/toolkit to women's groups and disseminating information about work and training opportunities from the project.</p> | | Included in R-EMDP cost |
| GENDER EQUALITY | Beneficiary communities and villages, poor and vulnerable households and ethnic groups, with | Direct beneficiaries of project; participants in value chains and water supply schemes to ensure awareness of | Information sharing (M), consultation (M), Collaboration (M) | Information: Community meetings and dissemination of information brochures on project scope, design elements, participation mechanisms, and entitlements for person affected by involuntary resettlement impacts. | | During detail design of infrastructure subprojects and throughout project implementation. Included in GAP budget |

| Topics/Subjects | Stakeholder Group | Why They are Included | Type of Participation | | Participation Methods | |
|---------------------|--|--|----------------------------|---|---|--|
| | | | | Methods | Responsibility | Time line Cost |
| | 50% representation of women. | negative impacts (land acquisitions, resettlement, compensation policy), implementation plan (to reduce inconveniences) and social risk reduction. | | Consultation through village meetings and focus group discussions on measures to enhance benefits and mitigate risks. Decisions: Community members determine participation and guidelines for women's groups with support from village leaders and mass organizations to ensure they are inclusive, with representatives of ethnic groups, women and other subgroups | | |
| SOCIAL RISKS | Mass Organizations (e.g. Vietnam Women's Union and ... | Representing interests of women and ethnic groups. | Information sharing (High) | Project management and Implementation: Direct consultations and participation in project implementation through collaboration with PMU and representation on provincial steering committee. Strategic Decision-Making: Contribute to decisions on destination | Monitoring: Representation on provincial steering committees and district / commune level committees. | During detailed design of subprojects and throughout project implementation. Included in GAP budget |

| Topics/Subjects | Stakeholder Group | Why They are Included | Type of Participation | | Participation Methods | |
|---|--|---|--|--|-----------------------|--|
| | | | | Methods | Responsibility | Time line Cost |
| | | | | management and GAP and consultation plan implementation. | | |
| Project Design, Implementation, Monitoring | Provincial and District Government | Representatives of government are responsible for project implementation, and representing provincial and district interests. | Partnership (H) (H) (Information sharing), (H) | Approvals: Review and approve annual work plan and budgets, safeguard documents, civil works design, and site management contracts or concessions. | PMU | During detailed design of subprojects and throughout project PMU cost |
| | Government Departments on National and Subregional Steering Committee. | Setting policy and guidelines and coordination and approvals. | Information Sharing, (H) Collaboration (Medium) | Policy Guidance and Approvals: Semiannual meetings of the national project steering committee provide direction on project implementation matters. Review periodic progress reports and safeguards reports. | PMU | At least two meetings of each committee per year. PMU management cost |

X. ANTICORRUPTIONPOLICY

158. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the project.²¹ All contracts financed by ADB shall include provisions specifying the right of ADB to audit and examine the records and accounts of the executing agency and all project contractors, suppliers, consultants, and other service providers. Individuals and/or entities on ADB's anticorruption debarment list are ineligible to participate in ADB-financed activity and may not be awarded any contracts under the project.²²

159. To support these efforts, relevant provisions of ADB's Anticorruption Policy are included in the loan regulations and the bidding documents for the project. In particular, all contracts financed by ADB in connection with the project shall include provisions specifying the right of ADB to audit and examine the records and accounts of the EAs, as well as all contractors, suppliers, consultants, and other service providers as they relate to the Project. Individuals/ entities on ADB's anticorruption debarment list are ineligible to participate in ADB- financed activity and may not be awarded any contracts under the project.³⁸ The project design and implementation arrangements provide for mitigation of corruption risks. Risks associated with project management, including procurement and disbursement, will be mitigated by the engagement of PISC to advise and assist in the procurement of goods and services, and the engagement of other consultants. The overall project will establish and operate a website in which it will disclose implementation progress; bid notifications and their results; and provide grievance redress mechanism against any corrupt practice. References on ADB's Anticorruption Policy can be accessed through the following link: <http://www.adb.org/Integrity/>.

²¹ Anticorruption Policy: <http://www.adb.org/Documents/Policies/Anticorruption-Integrity/Policies-Strategies.pdf>

²² ADB's Integrity Office web site: <http://www.adb.org/integrity/unit.asp>

XI. ACCOUNTABILITY MECHANISM

160. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.²³

²³ Accountability Mechanism. <http://www.adb.org/Accountability-Mechanism/default.asp>.

XII. RECORD OF CHANGES TO THE PROJECT ADMINISTRATION MANUAL

161. All revisions and/or updates during the course of implementation should be retained in this section to provide a chronological history of changes to implemented arrangements recorded in the PAM, including revision to contract awards and disbursement s-curves.

ANNEXES

ANNEX A: PROCUREMENT PLAN

Basic Data

| | |
|---|---|
| Project Name: Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project | |
| Project Number: 49026-002 | Approval Number: |
| Country: VIET NAM | Executing Agency: Provincial People's Committee of Bac Kan Provincial People's Committee of Cao Bang Provincial People's Committee of Lang Son Provincial People's Committee of Ha Giang |
| Project Procurement Classification: B | Implementing Agency: Provincial Department of Planning and Investment of Bac Kan Provincial Department of Planning and Investment of Cao Bang Provincial Department of Planning and Investment of Ha Giang Provincial Department of Planning and Investment of Lang Son |
| Procurement Risk: Moderate | |
| Project Financing Amount: \$190.3 million ADB Financing: \$150.0 million Cofinancing (ADB Administered): Non-ADB Financing: \$40.3 million | Project Closing Date: 30/09/2023 |
| Date of First Procurement Plan: 02/11/2017 | Date of this Procurement Plan: 02/11/2017 |

1. **Methods, Thresholds, Review and 18-Month Procurement Plan**(a) **Procurement and Consulting Methods and Thresholds**

162. Except as the Asian Development Bank (ADB) may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

| Procurement of Goods and Works | | |
|---|------------------------------------|--|
| Method | Threshold | Comments |
| International Competitive Bidding (ICB) for Works | \$10,000,000 and above | Prior review for all contracts |
| International Competitive Bidding for Goods | \$2,000,000 and above | Prior review for all contracts |
| National Competitive Bidding (NCB) for Works | Beneath that stated for ICB, Works | Prior review for 1 st contract implemented by each IA |
| National Competitive Bidding for Goods | Beneath that stated for ICB, Goods | Prior review for 1 st contract of the whole project |

| Procurement of Goods and Works | | |
|--------------------------------|-----------------|--|
| Method | Threshold | Comments |
| Shopping for Works | Below \$100,000 | Prior review for 1 st contract implemented by each IA |
| Shopping for Goods | Below \$100,000 | Prior review for 1 st contract implemented by each IA |

| Consulting Services | |
|---|--------------------------------|
| Method | Comments |
| Quality and Cost Based Selection (QCBS) | Prior review for all contracts |
| Fixed Budget Selection | Prior review for all contracts |
| Consultant's Qualification Selection | Prior review for all contracts |

(b) Goods and Works Contracts Estimated to Cost \$1 Million or More

163. The following table lists goods and works contracts for which the procurement activity is either ongoing or expected to commence within the next 18 months.

| Package Number | General Description | Estimated Value | Procurement Method | Review [Prior / Post/Post (Sampling)] | Bidding Procedure | Advertisement Date (quarter /year) | Comments |
|-------------------------|--|-----------------|--------------------|--|-------------------|---------------------------------------|---|
| Bac Kan Province | | | | | | | |
| BK 01 | Construction of road from km 0.0 to km 23.1 and Upgrade of 05 bridges at: (i) Km 8+100; (ii) Km 10+680; (iii) Km 16+200; (iv) Km 22+230; (v) Km 22+650. in Bang Thanh commune, Pac Nam district. | 9,131,700 | NCB | Prior | 1S1E | Q4/2018 | Pre-qualification of Bidders: No Domestic Preference Applicable: No Bidding document: Harmonized Standard Bidding Documents for NCB works issued by ADB |

| Package Number | General Description | Estimated Value | Procurement Method | Review [Prior / Post/Post (Sampling)] | Bidding Procedure | Advertisement Date (quarter /year) | Comments |
|--------------------------|--|-----------------|--------------------|---------------------------------------|-------------------|------------------------------------|---|
| Cao Bang Province | | | | | | | |
| CB 01 | Construction of inter province road DT211 (Km0 – Km28) and 03 new bridges at: (i) km 1+600; (ii) km 14+200; (iii) km 16+950 | 10,288,599 | NCB | Prior | 1S1E | Q4/2018 | Pre-qualification of Bidders: No Domestic Preference Applicable: No Bidding document: Harmonized Standard Bidding Documents for NCB works issued by ADB |
| CB 02 | Construction of water supply system and auxiliary works in Xuan Hoa Town, Phu Ngoc commune; Ha Quang District. | 2,019,000 | NCB | Post | 1S1E | Q4/2018 | Pre-qualification of Bidders: No Domestic Preference Applicable: No Bidding document: Harmonized Standard Bidding Documents for NCB works issued by ADB |
| Ha Giang Province | | | | | | | |
| HG 01 | Construction of the inter-province road PR184 (Km0-Km25.1) and 14 new bridges at: (i) Km 0+608.19; (ii) Km1+680.13; (iii) Km4+153.7; (iv) Km4+513.13; (v) Km 6+979.7; (vi) Km7+317.1; (vii) Km7+907.35; (viii) Km9+202.38; | 11,041,200 | NCB | Prior | 1S1E | Q4/2018 | Pre-qualification of Bidders: No Domestic Preference Applicable: No Bidding document: Harmonized Standard Bidding Documents for NCB works issued by ADB |

| Package Number | General Description | Estimated Value | Procurement Method | Review [Prior / Post/Post (Sampling)] | Bidding Procedure | Advertisement Date (quarter /year) | Comments |
|--------------------------|---|------------------|--------------------|---------------------------------------|-------------------|------------------------------------|---|
| | (ix) Km11+811.26; (x) Km12+657.56; (xi) Km14+842.12; (xii) Km17+603.25; (xiii) Km21+963.31; (xiv) Km24+915.61. | | | | | | |
| HG 02 | Construction and Installation of the pipeline system in Vinh Quang Town, Tu Nhan commune and Ban Nhung commune, Hoang Su Phi District | 1,412,800 | NCB | Post | 1S1E | Q4/2018 | Pre-qualification of Bidders: No Domestic Preference Applicable: No Bidding document: Harmonized Standard Bidding Documents for NCB works issued by ADB |
| | | | | | | | |
| Lang Son Province | | | | | | | |
| LS 01 | Construction of Road No. 61 (Km0-Km11) and 2 new bridges at: (i) Km 0+272.57; (ii) Km 6+636.99; at Binh Gia District. | 6,139,289 | NCB | Prior | 1S1E | Q4/2018 | Pre-qualification of Bidders: No Domestic Preference Applicable: No Bidding document: Harmonized Standard Bidding Documents for NCB works issued by ADB NCB will be considered for the combined package of LS01 and LS02 subject to ADB's assessment of the suitability of this arrangement. |
| LS 02 | Construction of Road No. 61 (Km11-Km22.95) and 1 new bridge at: (i) Km 14+754.13. | 7,443,011 | NCB | Post | 1S1E | Q4/2018 | Pre-qualification of Bidders: No Domestic Preference Applicable: No Bidding document: Harmonized Standard Bidding Documents for NCB works issued by ADB |

| Package Number | General Description | Estimated Value | Procurement Method | Review [Prior / Post/Post (Sampling)] | Bidding Procedure | Advertisement Date (quarter /year) | Comments |
|----------------|-----------------------|-----------------|--------------------|---------------------------------------|-------------------|------------------------------------|--|
| | at Binh Gia District. | | | | | | NCB will be considered for the combined package of LS01 and LS02 subject to ADB's assessment of the suitability of this arrangement. |

(c) Consulting Services Contracts Estimated to Cost \$100,000 or More

164. The following table lists consulting services contracts for which the recruitment activity is either ongoing or expected to commence within the next 18 months.

| Package Number | General Description | Estimated Value | Recruitment Method | Review (Prior/ Post) | Advertisement Date (quarter/year) | Type of Proposal | Comments |
|--------------------------|---|-----------------|--------------------|----------------------|-----------------------------------|------------------|---|
| Bac Kan Province | | | | | | | |
| BK_CS | Supervision of Construction works | 815,000 | QCBS | Prior | Q2 / 2018 | STP (70:30) | Assignment: National Comments: Time-based contract |
| BK_DED 01 | Detail Engineering Design for Road Subprojects | 1,381,000 | QCBS | Prior | Q1 / 2018 | STP (90:10) | Assignment: National Comments: Time-based contract |
| BK_DED 02 | Detail Engineering Design for Water Supply Subproject | 240,000 | CQS | Prior | Q1 / 2018 | BTP | Assignment: National Comments: Time-based contract |
| Cao Bang Province | | | | | | | |
| CBCS | Supervision of Construction works | 881,000 | QCBS | Prior | Q2 / 2018 | STP (70:30) | Assignment: National Comments: Time-based contract |
| CB_DED 01 | Detail Engineering Design for Road Subprojects | 1,095,800 | QCBS | Prior | Q1 / 2018 | STP (90:10) | Assignment: National Comments: Time-based contract |

| | | | | | | | |
|--------------------------|---|-----------|------|-------|-----------|-------------|---|
| CB_DED 02 | Detail Engineering Design for Water Supply Subprojects | 126,200 | CQS | Prior | Q1 / 2018 | BTP | Assignment: National Comments: Time-based contract |
| Ha Giang Province | | | | | | | |
| HGCS | Supervision of Construction works | 691,000 | QCBS | Prior | Q2 / 2018 | STP (70:30) | Assignment: National Comments: Time-based contract |
| HG_DED 01 | Detail Engineering Design for Additional Road Subprojects | 1,160,200 | QCBS | Prior | Q1 / 2018 | STP (90:10) | Assignment: National Comments: Time-based contract |
| HG_DED 02 | Detail Engineering Design for Water Supply Subprojects | 198,800 | CQS | Prior | Q1 / 2018 | BTP | Assignment: National Comments: Time-based contract |
| Lang Son Province | | | | | | | |
| LS CS | Supervision of Construction works | 871,000 | QCBS | Prior | Q2 / 2018 | STP (70:30) | Assignment: National Comments: Time-based contract |
| LSCS-ARVC | ARVC service provider | 2,994,000 | QCBS | Prior | Q2 / 2018 | FTP (90:10) | Assignment: National Comments: Time-based contract |
| CS-Audit | Project audit | 212,000 | FBS | Prior | Q2 / 2018 | BTP | Assignment: National Comments: (i) This includes project audit for Lang Son, Bac Kan, Cao Bang, and Ha Giang; and (ii) Lang Son will recruit the auditor on behalf of other three provinces. |

(d) Goods and Works Contracts Estimated to Cost Less than \$1 Million and Consulting Services Contracts Less than \$100,000 (Smaller Value Contracts)

165. The following table groups smaller-value goods, works and consulting services contracts for which the activity is either ongoing or expected to commence within the next 18 months.

| Goods and Works | | | | | | | | |
|--------------------------|--|------------------------|----------------------------|---------------------------|--|--------------------------|--|---|
| Package Number | General Description | Estimated Value | Number of Contracts | Procurement Method | Review [Prior / Post/Post (Sampling)] | Bidding Procedure | Advertisement Date (quarter/year) | Comments |
| Bac Kan Province | | | | | | | | |
| BK 02 | Construction water supply system and auxiliary works in Boc Bo Commune, Pac Nam District. | 955,800 | 1 | NCB | Post | 1S1E | Q4/2018 | Pre-qualification of Bidders: No Domestic Preference Applicable: No Bidding document: Harmonized Standard Bidding Documents for NCB works issued by ADB |
| Ha Giang Province | | | | | | | | |
| HG 03 | Construction of water supply system, including equipment and auxiliary works at Vinh Quang Town, Tu Nhan commune and Ban Nhung commune, Hoang Su | 671,900 | 1 | NCB | Post | 1S1E | Q4/2018 | Pre-qualification of Bidders: No Domestic Preference Applicable: No Bidding document: Harmonized Standard Bidding Documents for NCB works issued by ADB |

| | | | | | | | | |
|--|--------------|--|--|--|--|--|--|--|
| | Phi District | | | | | | | |
|--|--------------|--|--|--|--|--|--|--|

| Consulting Services | | | | | | | | |
|----------------------------|----------------------------|------------------------|----------------------------|---------------------------|------------------------------|--|-------------------------|-----------------|
| Package Number | General Description | Estimated Value | Number of Contracts | Recruitment Method | Review (Prior / Post) | Advertisement Date (quarter/year) | Type of Proposal | Comments |

2. Indicative List of Packages Required Under the Project

166. The following table provides an indicative list of goods, works and consulting services contracts over the life of the project, other than those mentioned in previous sections (i.e., those expected beyond the current period).

| Goods and Works | | | | | | | |
|---|-----------------------------|-------------------------------------|--------------------------------------|---------------------------|--|--------------------------|--|
| Package Number | General Description | Estimated Value (cumulative) | Estimated Number of Contracts | Procurement Method | Review [Prior / Post/Post (Sampling)] | Bidding Procedure | Comments |
| Bac Kan Province – Additional Subprojects | | | | | | | |
| 2 packages | Works output 1 roads | 17,715,595 | 2 | NCB | Post | 1S1E | (i) One package per subproject. (ii) A contract with multiple lots may be considered. |
| 2 packages | Works output 2 water supply | 3,510,905 | 2 | NCB | Post | 1S1E | (i) One package per subproject. (ii) Multiple contracts may be considered. |
| Cao Bang Province – Additional Subprojects | | | | | | | |

| | | | | | | | |
|---|-----------------------------|-------------------|---|-----|------|------|--|
| 2 packages | Works output 1 road | 17,054,096 | 2 | NCB | Post | 1S1E | (i) One package per subproject. (ii) A contract with multiple lots may be considered. |
| 1 package | Works output 2 water supply | 2,285,305 | 1 | NCB | Post | 1S1E | (i) One package per subproject. (ii) A contract with multiple lots may be considered. |
| Ha Giang Province – Additional Subprojects | | | | | | | |
| 2 packages | Works output 1 roads | 16,502,588 | 2 | NCB | Post | 1S1E | (i) One package per subproject. (ii) A contract with multiple lots may be considered. |
| 1 package | Works output 2 water supply | 3,065,266 | 1 | NCB | Post | 1S1E | (i) One package per subproject. (ii) A contract with multiple lots may be considered. |
| Lang Son Province – Additional Subprojects | | | | | | | |
| 3 Packages | Works output 1 roads | 16,015,800 | 3 | NCB | Post | 1S1E | (i) One package per subproject. (ii) A contract with multiple lots may be considered. |
| 3 Packages | Works output 2 water supply | 5,173,600 | 3 | NCB | Post | 1S1E | (i) One package per subproject. |

| | | | | | | | |
|--|--|--|--|--|--|--|---|
| | | | | | | | (ii) A contract with multiple lots may be considered. |
|--|--|--|--|--|--|--|---|

| Consulting Services | | | | | | | |
|---------------------|---------------------|------------------------------|-------------------------------|--------------------|-----------------------|------------------|----------|
| Package Number | General Description | Estimated Value (cumulative) | Estimated Number of Contracts | Recruitment Method | Review (Prior / Post) | Type of Proposal | Comments |
| | | | | | | | |

3. Non-ADB Financing

167. The following table lists goods, works and consulting services contracts over the life of the project, financed by Non-ADB sources.

| Consulting Services | | | | |
|--------------------------------|------------------------------|-------------------------------|---------------------|---|
| General Description | Estimated Value (cumulative) | Estimated Number of Contracts | Recruitment Method | Comments |
| Loan Implementation Consultant | 2,000,000 | 4 | National Procedures | Advertisement date: Q4/2017 Financed by Government |
| Pubic Asset Management | 2,000,000 | 8 | National Procedures | Advertisement date: Q2/2019 Financed by Government |
| Road Safety Awareness Training | 300,000 | 12 | National Procedures | Advertisement date: Q2/2019 Financed by Government |

4. National Competitive Bidding

a. General

168. The procedures to be followed for the procurement of goods, non-consulting services, and works under contracts awarded on the basis of National Competitive Bidding shall be those set forth in: (a) Law on Procurement No. 43/2013/QH13 dated November 26, 2013 ("Law on Procurement") and (b) Decree No.63/2014/ND-CP dated June 26, 2014 (collectively, "National Procurement Laws"). Whenever any procedure in the National Procurement Laws is inconsistent with the ADB Procurement Guidelines (March 2013, as amended from time to time), the ADB Procurement Guidelines shall prevail, amongst others on the following.

b. Eligibility

169. The eligibility of bidders shall be defined under section I of the ADB Procurement Guidelines; accordingly, no bidder or potential bidder should be declared ineligible for reasons other than those provided in section I of the ADB Procurement Guidelines, as amended from time to time. Conditions of bidders' participation shall be limited to those that are essential to ensure bidders' capability to fulfill the contract in question. Foreign bidders shall be eligible to participate under the same conditions as national bidders. Foreign bidders shall not be asked or required to form joint ventures with, or be subcontractors to, national bidders in order to submit a bid.

170. A firm declared ineligible by ADB cannot participate in bidding for an ADB-financed contract during the period of time determined by ADB.

171. A bidder shall not have a conflict of interest, which term shall be defined in accordance with section 1 of ADB Procurement Guidelines. Any bidder found to have a conflict of interest shall be ineligible for contract award.

172. Government-owned enterprises in the Borrower's country shall be eligible to participate as a bidder only if they can establish that they are legally and financially autonomous, operate under commercial law and are not dependent agencies of the Borrower or Sub-Borrower.

173. National sanction lists may only be applied with approval of ADB.

c. Preference

174. No preference of any kind shall be given to domestic bidders over foreign bidders or for domestically manufactured goods over foreign manufactured goods. Unless otherwise stated in the applicable financing agreement, preferences among domestic bidders set forth in Article 14(3) of the Law on Procurement shall not be applied.

d. Bidding Procedure

175. Single stage-single envelope shall be the default bidding procedure and application of other bidding procedures shall require ADB's prior approval.

e. Time for Bid Preparation

176. The time allowed for the preparation and submission of bids for large and/or complex packages shall not be less than thirty (30) days from the date of the invitation to bid or the date of

availability of the bidding documents, whichever is later.

f. Standard bidding documents

177. The Borrower's standard bidding documents, acceptable to ADB, shall be used. Bidders shall be allowed to submit bids by hand or by mail/ courier.

g. Bid Opening and Evaluation

- (i) Bids shall be opened in public, immediately after the deadline for submission of bids, regardless of the number of bids received.
- (ii) Except with prior approval of ADB, merit points shall not be used in bid evaluation.
- (iii) No price adjustments shall be made for evaluation purposes in accordance with Article 117(6) of Decree 63 when unit rates offered by the bidder are determined to be abnormally low.
- (iv) Bidders shall be given commercially reasonable time period to respond to clarification requests.
- (v) Bidders shall not be eliminated from detailed evaluation on the basis of minor, non-substantial deviations³.
- (vi) Except with the prior approval of ADB, negotiations contemplated under paragraphs 7 and 8 of Article 117 of Decree No. 63/2014/ND-CP shall not take place with any bidder prior to contract award.
- (vii) A bidder shall not be required, as a condition for award of contract, to undertake obligations not specified in the bidding documents or otherwise to modify the bid as originally submitted.

h. Rejection of All Bids and Rebidding

- (i) No bid shall be rejected on the basis of a comparison with the Procuring Entity's estimate or budget ceiling without ADB's prior concurrence.
- (ii) All bids shall not be rejected and new bids solicited without ADB's prior approval.

i. Publication of the Award of Contract and Debriefing.

- (i) For contracts subject to prior review, within 2 weeks of receiving ADB's "No—objection to the recommendation of contract award, the borrower shall publish in the Government Public Procurement Gazette, or well-known and freely-accessible website the results of the bid evaluation, identifying the bid and lot numbers, and providing information on: i) name of each bidder who submitted a bid; ii) bid prices as read out at bid opening; iii) name and evaluated prices of each bid that was evaluated; iv) name of bidders whose bids were rejected and the reasons for their rejection; and v) name of the winning bidder, and the price it offered, as well as the duration and summary scope of the contract awarded.
- (ii) For contracts subject to post review, the procuring entity shall publish the bid evaluation results no later than the date of contract award.
- (iii) In the publication of the bid evaluation results, the Borrower shall specify that any bidder who wishes to ascertain the grounds on which its bid was not selected, may request an explanation from the Borrower. The Borrower

shall promptly provide an explanation of why such bid was not selected, either in writing and/or in a debriefing meeting, at the option of the Borrower. The requesting bidder shall bear all the costs of attending such a debriefing.

j. Contract Administration

178. The Contract Agreement, as such term is defined in the relevant bidding document, shall be applied without any modification during implementation except as otherwise agreed by ADB.

k. Fraud and Corruption

179. A provision shall be included in all bidding documents for NCB works and goods contracts financed by ADB stating that ADB will sanction a party or its related parties, including declaring ineligible, either indefinitely or for a stated period of time, to participate in ADB-financed, administered or supported activities if it at any time determines that the party has, directly or indirectly through an agent, engaged in integrity violations as defined under ADB's Integrity Principles and Guidelines, including corrupt, fraudulent, collusive, or coercive practices in competing for, or in executing, an ADB-financed, administered or supported contract.

l. Right to Inspect/ Audit

180. Each bidding document and contract financed by ADB shall include a provision requiring bidders, contractors, agents (whether declared or not), sub-contractors, sub-consultants, service providers, or suppliers and any personnel thereof, to permit ADB to inspect all accounts, records and other documents relating to any prequalification process, bid submission, and contract performance (in the case of award), and to have them audited by auditors appointed by ADB.

ANNEX B: CONSULTANT'S TERMS OF REFERENCE

1. Loan Implementation Consultant TORs

a. Infrastructure Engineer (40 person months per province) – team leader

181. The Infrastructure Engineer position may be divided into two positions one for roads (20 PM) and one for water supply (20 PM), of which one of the engineers will be the team leader. The infrastructure engineer will provide implementation support and coordinate the other specialists' inputs under the project. The position requires infrastructure engineer qualification and experience in order to provide technical input to the PMU decision making regarding the approvals for procurement, contracting, and supervision of works contracts. The specialist will report to the Project Director and the Deputy Directors and will be based in the Project Management Unit (PMU) and will provide leadership of the LIC team and ensure the day to day management of the LIC responds to work plans agreed by the PMU.

182. The Infrastructure Engineer will hold a tertiary qualification, preferably with a post graduate degree in transport, civil and agricultural engineering. The specialist will be familiar with working in multinational donor projects.

183. They will have a minimum of 10 years' experience in rural infrastructure development that must include road and water supply construction. Ideally the candidate will have experience both within the project provinces and in Team Leadership.

184. Duties of the specialist include to act as the LIC Team Leader in its management and technical duties including:

- (i) Support project quality assurance regime for the road and water supply subprojects;
- (ii) Provide a technical review of proposed road and water supply designs in subproject investment reports and investment studies prepared by consultants in participating provinces;
- (iii) Support the provincial roads and water supply specialists in briefing consulting engineers engaged to prepare subproject investment reports and investment studies on the proposed changes and explain the reasons for these changes;
- (iv) Prepare construction supervision quality control guidelines to be followed by the provincial consultants appointed to carry out this task. This shall specifically address the quality control of materials and the construction processes;
- (v) Provide technical review for all road and water supply subproject investment reports and investment studies and provide recommendations;
- (vi) Assist the PMU in the scheduling and planning of project implementation;
- (vii) Provide technical support and input to procurement, contracting, disbursement and liquidation of expenditures following ADB procedures;
- (viii) Assist in the design, planning and supervision of the monitoring of implementation safeguards and benefits;
- (ix) Ensure that baseline surveys and quarterly reports are carried out to obtain the necessary information to measure and report implementation performance.
- (x) Ensure that appropriate levels of community participation are undertaken in the detailed design activities;
- (xi) Supervise the training consultants and ensure that the training program is properly prepared and implemented;
- (xii) Ensure that the safeguard studies are undertaken for each of the subprojects and assist in preparing RPs/REMDPs for new sub-projects and updating REMDPs to submit to ADB for review and approval before implementation;

- (xiii) Assist the PMU by reviewing and overseeing the input of the construction supervision consultants as and when required;
- (xiv) Bring safeguard issues identified by other consultants, SOs or the monitoring teams to the attention of the PMU, accompanied by recommendations for action;
- (xv) Assist the PMU to develop the information for their preparation of the project completion report.

b. Social Safeguard Specialist (10 pm per province):

185. The safeguard requirements of ADB seek to ensure the poor and other disadvantaged groups within the target area access project benefits. This will require specialist expertise in identifying affected groups characteristics and needs and accommodating these needs wherever feasible. Given the large proportion of ethnic minorities among the target population, measures will need to be taken to ensure these groups benefit from project interventions. The specialists will support project initiatives in community development including gender and indigenous peoples' activities.

186. The specialist will assist the PMUs in developing and implementing initiatives to assure that benefits are shared by all disadvantaged groups including the ethnic minorities. In addition, there is scope to develop other associated initiatives that will target women, the poor and ethnic groups that require further definition during preparation of subprojects for funding under the proposed Project. The specialist will have tertiary qualifications from a recognized institution with preferably 10 years of experience in related fields on internationally funded projects.

187. The specialist needs to work closely with the respective PMU and other stakeholders to ensure implementation of the project social safeguards will comply with ADB safeguard policy statement 2009 and relevant regulations of the government. Duties of the specialists will include the following:

- (i) Review the Poverty and Social Assessment, REMDP's, REMDF and the PAM to ascertain the nature and extent of interventions considered appropriate under the project;
- (ii) Review/ascertain changes or updates to ADB and Government policies on ethnic minorities and resettlement as set out in the PAM;
- (iii) Prepare and deliver workshops on social safeguards to ensure sound understanding of the principles and operational requirements for PMU staff and other relevant stakeholders;
- (iv) Assist the PMU and related agencies in preparation, update, implementation and monitoring of REMDPs to ensure that all provisions and requirements from all approved subproject REMDPs are undertaken and ensure they are appropriately monitored by the project performance monitoring systems (PPMS);
- (v) In coordination with the Commune Supervision Boards (CSB) monitor (government funded and includes at least one woman) all subprojects to determine if serious negative impacts on ethnic minorities, women or other disadvantaged groups are occurring and make recommendations to the PMU to ameliorate/mitigate these;
- (vi) In coordination with the CSB monitor community involvement in subproject implementation and bring issues or problems to the attention of the PMUs;
- (vii) In coordination with the CSB document the community participation process and make recommendations for changes in processes and procedures for the balance of the project to strengthen the understanding and skills of government staff in this critical area;
- (viii) Assist the PMUs in development of performance frameworks and quarterly

- (ix) activity schedules for the Community Development Officers; and
- (ix) Other relevant duties and responsibilities as required.

c. Gender Specialist (National - 6 person months per province or total 24 person months)

188. The specialist will have academic training in social sciences and the role of gender in development. The specialist will need experience in gender mainstreaming with respect to rural communities in Viet Nam that include ethnic minorities. Prior knowledge and experience with Effective Gender Mainstreaming strategies and lessons in ODA projects is highly desirable. The specialist's TOR will include but not limited to:

- (i) Support PPMU to implement GAP (including provide gender technical inputs in coordination with other experts for gender related training, briefing to stakeholders, workshop, training and IEC materials development, gender provision in bidding documents, assessment and studies, etc.
- (ii) Develop and deliver training and mentoring of each PMU's gender focal point in GAP implementations
- (iii) Review PMUs workplan and schedules and suggest options for strengthening the gender mainstreaming activities as defined in the GAP
- (iv) Support PPMUs to implement GAP implementation recommendations by ADB mission.
- (v) Support PPMUs to monitor and report to ADB in coordination with M&E specialist.

d. Environment Safeguard Specialist (24 person months per province)

189. While the pre-screened subprojects are expected to have minimal long-term environmental impacts, there are possibly short-term concerns for which mitigation strategies need to be designed and implemented. Expertise is needed to ensure that the subprojects have well-developed and executable environmental management plans (EMP) with appropriate mitigation measures based on the environmental assessment and review framework prepared. They will develop mechanisms to ensure that mitigating measures are observed and will establish reporting formats to monitor the performance of contractors during the construction phase when environmental impacts are most likely.

190. The specialists will have appropriate tertiary qualifications in environmental science or natural resource management from a recognized institution and will have more than 10 years of experience working in the field of environmental management for internationally funded development projects. Training skills would also be an advantage to the international and national specialists. The specialists will be based in PMU and will be required to visit subproject sites for monitoring purposes and training as required while being responsible to the LIC team leader.

191. The specialist needs to work closely with the respective PMU and other stakeholders to the project will comply with ADB safeguard policy statement 2009 and relevant regulations of the government. Detail duties of the specialists will include the following:

- (i) Review the environmental recommendations of the PPTA Final Report and the formats for environmental examinations contained therein;
- (ii) Assist with the screening of subprojects, completing REA checklists for candidate subprojects;
- (iii) Brief the staff of the PMUs in participating provinces on environmental procedures and requirements for subproject preparation;
- (iv) Visit each subproject during the subproject preparation to ensure environmental

- safeguards are being properly conducted providing advice and support for IEE preparation;
- (v) Assist the PMUs with the internal review of the initial environmental examinations and associated environmental management plans prepared for each subproject and assist with updating the draft IEEs in response to comments received;
 - (vi) Assist the PMUs to ensure that EMP is adequately integrated in bidding document and civil contract; Assist PMU in establishment and operation of environment management system described in EMP;
 - (vii) Undertake regular supervision of the contractor's environmental performance and assist PMU to carry out subproject environment sampling for surface/ground water quality, dust and noise as required in the EMP, and prepare semiannual monitoring report for submission to ADB and government environment authority and;
 - (viii) Assist in the preparation and implementation of training activities regarding the environmental aspects of the Project.

e. Financial and Accounting Specialist (60 person months per Province):

192. The Specialist shall have tertiary qualifications in accounting or similar discipline, or its equivalent - CPA qualifications is preferred. The specialist shall have extensive experience (minimum 10 years) in designing and implementing accounting systems or similar projects in Viet Nam. The specialist must have good working knowledge of English, and work experience with any donor-funded project a distinct advantage.

193. The specialist will advise and assist PMU on overall accounting functions and activities of the Project and ensure that a separate set of accounts is kept for the project. The specialist will perform the following tasks:

- (i) Develop a suitable project accounting system, chart of accounts, and procure and adapt any necessary software to ensure an effective and efficient project accounting, monitoring and reporting system to project executing and implementing agency managers and ADB. The system will be capable of producing routine reports by which the Project's financial and physical progress can be monitored and evaluated;
- (ii) Ensure that financial transactions are, in all cases, recorded in project accounts accurately and on a timely basis and in accordance with ADB and the government requirements and agreed financial policies and procedures for the Project;
- (iii) Ensure that Project expenditures on contract payments are made in accordance with the terms and conditions of the respective contracts and are adequately certified by duly authorized officials in relation to works completed and/or goods or services provided;
- (iv) Ensure that adequate internal control is established and maintained in terms of separation of responsibilities for processing and authorizing payments and in the management and accounting for project expenditures and assets;
- (v) Ensure that all financial records are retained for audit purposes and for review by ADB and the government until at least one year following Project completion;
- (vi) Ensure that Project financial transactions are recorded in the accounts in accordance with the government regulations and ADB requirements and that records are reconciled periodically, at least on a monthly basis;
- (vii) Ensure that the advance account and Sub-Accounts to be established for the Project in local commercial banks are administered in accordance with ADB requirements;
- (viii) Ensure that withdrawal requests for reimbursements from ADB are prepared and submitted to the government and to ADB on a timely basis and in accordance with ADB procedures to replenish the advance account. Ensure that Statements of Expenditures (SOEs) supporting withdrawal requests accurately reflect qualifying

- project expenditures and that underlying documents that verify these expenditures are retained and available for review as required;
- (ix) Periodically, but at least quarterly, reconcile project records with ADB records relating to disbursements from ADB's Loan for all Project components. Project records and bank statements should be reconciled more frequently, at least monthly;
 - (x) Ensure timely preparation and distribution of integrated quarterly financial management and project management reports and annual project financial reports and statements required by ADB, under the provisions of the Loan Agreement, as well as by the government. Provide any special financial reports that may be required from time to time on specific aspects of project's financial progress or position as may be requested by ADB and/or the government;
 - (xi) Ensure that annual Project budgets are consistent with agreed program activity levels and expenditures and that budgetary allocations for the Project are available to meet projected cash flow requirements for contract payments, pending reimbursement by ADB, and for administrative expenditures of PMU and implementing units;
 - (xii) Ensure that Project assets and inventories are safeguarded and revalued and verified periodically in accordance with the requirements of ADB and government of Viet Nam and to support annual Project financial audits;
 - (xiii) Liaise effectively with auditors to ensure effective annual audits in accordance with ADB's requirements;
 - (xiv) Conduct on-the-job training on project accounting and through classroom presentations; and
 - (xv) Prepare progress reports for inclusion in the monthly, quarterly and annual progress reports to be prepared by PMU

2. Construction Supervision Consultants

a. Objective

194. The primary objectives of the consulting services are to:

- (i) Function as the Engineer in administering the civil works contract (the Contract);
- (ii) Design Consultants Contractors;
- (iii) Review and advise NEP DPis/PMUs (the Employer) on approval of the construction methods and construction implemented by the Construction Contractors;
- (iv) Ensure that the permanent and temporary works have been designed and are constructed in accordance with the provisions of the Contracts and in accordance with the Vietnamese Design and Construction Standards; and
- (v) Advise the Employer on all matters concerning implementation of the Contracts including quality control, work progress, implementation issues, and arbitration or litigation etc.

b. Scope of Work

i. Civil Works Contract Administration

195. Design review. Detailed engineering designs have been prepared through a firm of consultants. The design review includes, but is not limited to, the following:

- (i) Establish the schedule, methods and procedures for the review of detailed engineering design and construction drawings of the civil works provided by the Employer.
- (ii) Review the detailed design and construction drawings in accordance with the

- design standards, criteria and conceptual design provided in the Contract.
- (iii) Ensure that the Technical Specifications in the Bid Documents and the provisions of Vietnamese Design and Construction Standards have been duly accounted for in the detailed engineering design and construction drawings.

ii. Contract Administration

196. The construction works will be executed under the Contract for Works of Civil Engineering Construction. Accordingly, NEP DPis/PMUs will be the Employer and the consultant will function as the Engineer.

197. The consultant will administer the civil works contracts and ensure that the road and water supply subprojects are constructed in accordance with the provision of the civil works contracts. The consultant will be required to nominate an engineer's representative who will be a full-time resident in the project area. The responsibility of the Engineer includes, but is not limited to, the following tasks:

- (i) Give the order to commence the works;
- (ii) Review and approve contracts proposed personnel for positions nominated in the Contract;
- (iii) Inspect and approve all material sources identified by the Contractor;
- (iv) Review and approve the Contractor's implementation schedule, and supervise the progress of construction works. The Consultant will keep the Employer informed of any delay or potential delays in the work schedule of the Contract, and will take all necessary actions to prevent potential delays;
- (v) Review, approve and monitor the construction plan to minimize disruption to vehicular traffic and water supply and agricultural activities during construction, and to ensure that construction activities do not endanger safety of the public;
- (vi) Regularly monitor and inspect the contractor's quality control and assurance program to ensure that quality of the finished works meet the contract standards and specifications. This includes regular checking of the materials testing program;
- (vii) Advise and assist the Employer with respect to arbitration or litigation relating to the works, whenever required;
- (viii) Monitor progress of the construction works through computer-aided project management techniques;
- (ix) Convene regular site meetings with the Contractor to discuss issues and problems affecting the progress, and brief the Employer;
- (x) Coordinate with the relevant local government authorities/agencies so as to minimize disruption to the works program, as required by the Contractor;
- (xi) Review the contractor's insurance cover to ensure that the contractor has provided all the insurance required by the contract and such insurance are maintained throughout the contract period;
- (xii) Prepare any required variation orders requested by the Employer and review any variation order proposed by the contractor and provide their advice to the Employer in accordance with the contract;
- (xiii) Review all claims submitted by the Contractor and provide advice to the Employer of the validity of the claim, the effect of such claim on the construction schedule and the cost of the project;
- (xiv) Review and comment on the monthly progress reports submitted by the contractor detailing the work undertaken during the previous month, the progress of the work against the approved schedule, the problems and difficulties encountered by the contractor and other issues requested by the Employer;
- (xv) Issue completion certificate after satisfactory completion of the works in accordance with the contract provisions;
- (xvi) Supervise updating of the Resettlement Plan, if necessary, and develop poverty

- monitoring impact monitoring systems;
- (xvii) Review and advise the Employer whether the construction methods as proposed by the contractor for carrying out the works are satisfactory, with particular references to the technical requirements of sound environmental standards on the basis of ADB's Safeguards Policy Statement (2009), inspection of contractor's construction equipment, safety of the works, property, personnel, and general public;
- (xviii) Assess and check the laboratory and field tests carried out by the contractor, and independent tests.
- (xix) Issue orders to the Contractor to remove or improve any works that are not in accordance with the drawings and/or specifications;
- (xx) Maintain records of all testing work, including cross-referencing of items of work to which each test refers and location from which any samples were obtained for testing.
- (xxi) At the completion of the contract, verify the contractor's "as-built drawings" as a true record of the works as constructed;
- (xxii) Measure the completed works and keep detailed records, including the measurement books;
- (xxiii) Prepare quarterly cash flow projections for the Employer in an acceptable format, in which cash flow should identify budget estimates for all outstanding works;
- (xxiv) Supervise the maintenance of records for all plant, labor and materials used in the construction of the works;
- (xxv) Supervise the process of interim and final payments to the Contractor (interim monthly payment shall be based on interim payment certificate processed by the Consultant following claims filed by the Contractor);
- (xxvi) The Consultant will be responsible for checking and monitoring the performance requirements in the Contract and ensuring the criteria and limits are met;
- (xxvii) Maintain a day-to-day diary, which shall record all events pertaining to the administration of the contract, request forms, and order given to the contractor, and any other information which may at a later date be of assistance in resolving queries which may arise connecting execution of the works;
- (xxviii) Supervise the implementation of training programs of NEP DPIs/PMUs staff at the site on project management including quality assurance and contract administration.

198. In addition or as an expansion of the activities and responsibilities required of the engineer under the civil works contracts, the consultant will:

- (i) ensure that the construction methods proposed by the contractor for carrying out the works are satisfactory, with particular references to the technical requirements of sound environmental standards on the basis of the ADB's Safeguards Policy Statement (2009);
- (ii) inspection of contractor's construction equipment; safety of the works, property, personnel, and general public; and the recommendations of the Environmental Management Plan (EMP);
- (iii) supervise the implementation of the environmental monitoring plan and annual report of implementing this plan as part of project implementation report.
- (iv) supervise the provision of environmental management seminars for contractors and NEP DPIs/PMUs staff;
- (v) supervise of resettlement plans as per ADB's Safeguards Policy Statement (2009);
- (vi) monitor the Construction Contractors to ensure that no child labor is used for the execution of the civil works contracts as required by the civil works contracts;
- (vii) monitor the implementation of the health and safety program at camp site including the information and education campaign on sexually-transmitted diseases and HIV/AIDS (human immunodeficiency virus/acquired immunodeficiency syndrome)

- (viii) as required by the civil works contracts; and supervise the implementation of training programs for NEP DPis/PMUs staff at site on project management including quality assurance, contract administration, and water treatment system maintenance.

iii. Actions Requiring Specific Approval of the Employer

199. The consultant will be required to obtain prior approval of the employer in the following matters as specified in the civil works contracts:

- (i) Recommending the subletting of any part of the works;
- (ii) Certifying additional cost;
- (iii) Determining an extension of time;
- (iv) Issuing a variation having financial implications; and
- (v) Fixing rates or prices.

iv. Project Performance Monitoring/Benefit Monitoring and Evaluation

200. The consultant will help the Employer establish a system for project performance monitoring in accordance with the project framework. The consultant will:

- (i) Identify, on the basis of the project framework developed during project processing, performance indicators to be monitored during the implementation of the Project;
- (ii) Advise on the establishment of systems for collecting data and statistics for such monitoring;
- (iii) Advise on the carrying out a baseline survey on performance indicators including on poverty, socioeconomic survey, gender development, employment– generation amongst others to Project Affected Persons, and other social and economic development activities;
- (iv) Advise on collection of required data and undertake other relevant surveys before construction and immediately after completion of the Project; and
- (v) Incorporate findings and supporting data in the project completion report, in accordance with a schedule and terms of reference to be mutually agreed by NEP DPis/PMUs and ADB.

c. Reporting and Deliverables:

201. CSCF will produce the following reports in English:

- (i) Monthly reports on progress of all construction work;
- (ii) A draft subproject completion report to be submitted to each PMU within two months of the completion of subproject construction; and
- (iii) Submit a final subproject completion report within one month of receipt of comments from PMU.

d. Resources

202. The consulting services will be contracted using QCBS method with STP type of proposal and time-based contract by each PMU. The PMU will enter into procurement within 3 months of loan signing. The required inputs for each PMU are:

Lang Son Province

| No. | Expertise | Quantity | Person months |
|--------------|--------------------------|-----------|---------------|
| 1 | Road CS Engineer | 3x30 | 90 |
| 2 | Bridge CS Engineer | 2x22 | 44 |
| 3 | Water Supply CS Engineer | 3x20 | 60 |
| 4 | Irrigation CS Engineer | 1 | 12 |
| 5 | Electrical Engineer | 1 | 24 |
| 6 | Unallocated (M&E) | 1 | 24 |
| Total | | 12 | 254 |

Bac Kan Province

| No. | Expertise | Quantity | Person months |
|--------------|--------------------------|----------|---------------|
| 1 | Road CS Engineer | 2x36 | 72 |
| 2 | Bridge CS Engineer | 2x24 | 48 |
| 3 | Water Supply CS Engineer | 3x12 | 36 |
| Total | | 7 | 156 |

Cao Bang Province

| No. | Expertise | Quantity | Person months |
|--------------|--------------------------|----------|---------------|
| 1 | Road CS Engineer | 3x27 | 81 |
| 2 | Bridge CS Engineer | 3x18 | 54 |
| 3 | Water Supply CS Engineer | 2x12 | 24 |
| Total | | 8 | 159 |

Ha Giang Province

| No. | Expertise | Quantity | Person months |
|--------------|--------------------------|----------|---------------|
| 1 | Road CS Engineer | 3x27 | 81 |
| 2 | Bridge CS Engineer | 3x18 | 54 |
| 3 | Water Supply CS Engineer | 2x12 | 24 |
| Total | | 8 | 159 |

e. Qualification Requirements

i. Team Leader/Construction Supervision Engineer

- (i) Professional standard: Qualified Transport / Water Resources Engineer or similar field holding a current Construction Supervision Practice Certificate
- (ii) Work experience: at least 12 years, including at least 8 years of project management.
- (iii) Extensive experience in a wide range of civil engineering activities and experience with ODA Funders (ADB, WB and other Funders)
- (iv) At least 5 years engaged in supervision of detailed design or construction of projects (with Construction Supervision Practice Certificate).
- (v) English ability: Fluent oral and written English.
- (vi) Good health.

ii. Deputy Team Leader: Design Supervision/ Construction Supervision engineer

- (i) Professional standard: Qualified Transport / Water Resources Engineer or similar field holding a current Construction Supervision Practice Certificate
- (ii) Work experience: at least 10 years.
- (iii) Extensive experience in a wide range of civil engineering activities and experience with ODA Funders (ADB, WB and other Funders)
- (iv) At least 5 years of experience in detailed design appraisal or in construction supervision (with Construction Supervision Practice Certificate) for water resources

projects.

- (v) English ability: Good standard of oral and written English.
- (vi) Good health.

iii. Road/Bridge Design Engineers

- (i) Professional standard: Qualified Water Resources Engineer or similar field holding a current Construction Supervision Practice Certificate
- (ii) Work experience: at least 10 years.
- (iii) Extensive experience in a wide range of civil engineering activities and experience with ODA Funders (ADB, WB and other Funders)
- (iv) At least 5 years of experience in construction supervision (with Certificate) for roads/bridges projects
- (v) English ability: Good standard of oral and written English.
- (vi) Good health.

iv. Water Supply Design Engineer

- (i) Professional standard: Qualified Water Resources Engineer or similar field holding a current Construction Supervision Practice Certificate
- (ii) Work experience: at least 10 years.
- (iii) Extensive experience in a wide range of civil engineering activities and experience with ODA Funders (ADB, WB and other Funders)
- (iv) At least 10 years of experience in detailed design and at least 5 years of experience in design document appraisal (with construction supervision certificate) for water resources projects
- (v) English ability: Good standard of oral and written English.
- (vi) Good health.

v. Electrical Engineer

- (i) Professional standard: Qualified Electrical Engineer or similar field holding a current Construction Supervision Practice Certificate
- (ii) Work experience: at least 5 years.
- (iii) Extensive experience in a wide range of civil engineering activities and experience with ODA Funders (ADB, WB and other Funders)
- (iv) At least 5 years of experience in electrical works supervision of water supply works or related infrastructures (with construction supervision certificate).
- (v) English ability: Good standard of oral and written English.
- (vi) Good health.

vi. Monitoring Expert

- (i) Professional standard: Qualified agriculturalist with agricultural engineering background
- (ii) Work experience: at least 10 years.
- (iii) Extensive experience in a wide range of monitoring of output and outcomes with experience with ODA Funders (ADB, WB and other Funders)
- (iv) At least 10 years of experience in detailed design and at least 5 years of experience in design document monitoring for supervising producer and value chain impacts
- (v) Experience working with private sector service provider in agricultural value chains
- (vi) English ability: Good standard of oral and written English.
- (vii) Good health.

vii. Social Safeguard Specialist (Resettlement and Ethnic Minority)

- (i) Professional standard: Tertiary qualifications in sociology, anthropology or similar field
- (ii) Work experience: at least 10 years in implementation of resettlement for ODA projects.
- (iii) Extensive experience in a wide range of civil engineering activities and experience with ODA Funders (ADB, WB and other Funders)
- (iv) At least 5 years of experience in supervision of social aspects of construction.
- (v) English ability: Good standard of oral and written English.
- (vi) Good health.

viii. Social/Gender Specialist

- (i) At least 8 - year experience in implementing, monitoring and reporting on Gender main streaming plans of development projects (preferable with infrastructure related project and international donors funded projects)
- (ii) Having proven skills and experience on gender related training design and delivery.
- (iii) Being familiar with Vietnamese government gender related laws and policies.

ix. Environment Expert

- (i) Professional standard: Environment science and technology expert or similar field
- (ii) Work experience: at least 10 years.
- (iii) Extensive experience in a wide range of civil engineering activities and experience with ODA Funders (ADB, WB and other Funders)
- (iv) At least 5 years of experience in supervision of environment aspects of construction.
- (v) English ability: Good standard of oral and written English.
- (vi) Good health.

3. Output 3: Agribusiness Service Provider

a. Background

203. The purpose of Output 3: Agricultural Value Chain Infrastructure for Lang Son province is to assist the development of Lang Son's horticultural sector using an agribusiness value chain approach.

204. Although the horticultural sector is an important economic contributor to the Lang son economy, it is weakly developed and the main commodities exhibit low levels of commercialization. The sector's potential for growth is severely constrained by weak industry coordination and a lack of a comprehensive development strategy. Sector development plans remain production based and these fails to address a number of constraining factors, including market failure. The sector is characterized by commodities that are grown by many small holders on small areas, have low output volumes, and with weakly formed value chains with products sold into lower value markets. The value chains businesses have limited financial resources and access to investment capital is a major constraint. The Lang Son provincial government has a piecemeal approach to support, and this is weakly coordinated across the departments with horticultural sector responsibilities.

205. Horticultural sector development is also constrained by the small scale of product groups. Only star anise has small to medium sized commercial businesses, but even these businesses do not have the financial resources to fund their own development. Successful product development requires a mix of support measures that will enable the small immature product industries, and their value chains, to become more commercial and market orientated. Overcoming the constraint of small product industry size and developing competitive export product value chains is the major strategic challenge that the Lang Son horticultural industry

faces. The prospect of the small Lang Son horticultural product industries growing into stable and profitable export value chains is unlikely without a coordinated sector wide approach and a significant commitment to building strong market led strategies.

b. Project Investment

206. The Project investment will address the need for coordinating the small, fragmented and disjointed structure of the existing horticulture sector and the associated market failure. Support for the establishment of a Horticultural Sector Industry Organization (working title HortLangSon) is a key feature of the Project investment. HortLangSon will be the institutional basis for initiating and sustaining commercial market focused product groups and value chain development and growth.

207. HortLangSon will be an industry organization that represents the private sector and will lead and coordinate the development of the Lang Son horticultural sector. It is expected to support small industry groups to grow into a larger grouping thus creating a critical mass sufficient to promote market led commercial horticulture with an emphasis on value creation within Lang Son Province. The industry support will recognize the ethnic diversity of the stakeholders, and the important role played by women in production, business and marketing activities.

208. HortLangSon's role and functions are intended to add value to the existing State management responsibilities of the various government departments through providing an overall strategic coordination and vision at a value chain scale. The functions will not compete or overlap. HortLangSon will provide a focal point for coordinated input by the various State and non-state management agencies into horticulture sector development.

c. Implementation Support Challenge

209. Successful development of HortLangSon requires specialist agribusiness implementation and contract management support. Unfortunately, there is a dearth of horticulture sector agribusiness expertise in Viet Nam. The national and provincial government agencies do not have the required agribusiness capacity to advise and assist the development of HortLangSon. The government agencies also lack experience to plan and manage inclusive growth programs, especially to where women are actively involved in value chain activities. A suitably experienced specialist Agribusiness Implementation and Contract Management service provider is required to assist with the establishment of HortLangSon and to get it operational.

d. Objectives

210. The objectives for the Agribusiness Contract Implementation and Supervision Management service provider are to:

- (i) Ensure that HortLangSon is developed as an effective horticultural industry organization that provides a coordinated business and market led approach to sector development;
- (ii) Assist HortLangSon to establish a Secretariat that will support the Board and be responsible for all sector support functions;
- (iii) Assist the HortLangSon Secretariat to undertake key sector functions that include sector strategic planning, enhanced quality control standards, develop trade relationships, and provide a range of services for sector members;
- (iv) Assist the HortLangSon Secretariat to plan and implement the exemplar star anise and vegetable value chain development activities.

e. Scope of Services

211. The contracted Agribusiness Contract Implementation and Supervision Management service provider will be responsible for provision of the following services:

- (i) Oversee the establishment of HortLangSon as an Industry Organization including its role and functions, constitution and mandate, Board guidelines, and defined Secretariat operational functions;
- (ii) Initially fill the Secretariat role and guide the HortLangSon operations;
- (iii) In the Secretariat role prepare a Horticultural Sector Strategic and Market plan;
- (iv) Assist sector members to form separate product groups based around the main commodities (for smaller sub sectors some groups maybe a combination). The first product group to be formed will be based upon the current Star Anise Association;
- (v) Advise and assist the PMU to establish the contestable funding mechanism that will be basis for the Project's contestable funding grants. Manage the grant funding mechanism for the HortLangSon Board;
- (vi) Establish the HortLangSon Trade, Markets and Quality information system service to support sector members;
- (vii) Initiate the development of quality assurance systems for the various commodity value chains focused on quality standards and traceability. The star anise and vegetable value chains will be the priority quality assurance systems established;
- (viii) Prepare and implement a sector outreach and education program aimed at enhancing the knowledge and awareness of sector product group members about issues influencing the development of the sector. An on-going education program will be based upon the priorities identified in the sector strategic plan;
- (ix) Design and implement a system to monitor and assess sector performance. Note: this is not the usual project M&E system – it is a system to better monitor the key features of the horticultural sector to assist HortLangSon more effectively manage the sector, and will feature gender disaggregated data;
- (x) Following the successful establishment of HortLangSon and the Secretariat functions commence the program to develop the two exemplar value chains: star anise and vegetables;
- (xi) Implement the star anise and vegetables value chain developments following the Project guideline and regulations as outlined in the PAM;
- (xii) Ensure that an inclusive approach is followed that ensures that the high proportion of ethnic minority sector stakeholders, and women, have equitable access to the Project's resources and support programs;
- (xiii) Once the star anise and vegetable value chains have been successfully established assist HortLangSon to identify the next value chains that the Project will assist;
- (xiv) Assist the HortLangSon secretariat to implement the next value chains following the Project guideline and regulations;
- (xv) After two years of contract management services assist the HortLangSon Board to recruit permanent Secretariat staff members and provide the required capacity development program for the new staff.

f. Qualifications and Experience

- (i) The Agribusiness Contract Implementation and Supervision Management service provider will have the following qualifications and experience:
- (ii) Minimum of three staff with post graduate qualifications in agribusiness and value chains, horticultural production, agricultural marketing, or agro food quality assurance systems;
- (iii) Proven record of assistance to agribusinesses and the agribusiness sector in Viet Nam;
- (iv) Demonstrated experience in the management and implementation of commercial horticultural value chain projects for export and national markets. Including the

- (v) provision of technical support to small holder women and men farmers;
- (vi) Demonstrated expertise in the implementation of internationally recognized agro-food quality assurance systems and traceability for export and national markets;
- (vii) Demonstrated experience in providing institutional development and capacity building services to agribusinesses and horticultural and agricultural sector organizations in Viet Nam and the Greater Mekong subregion;
- (viii) Demonstrated experience of implementing agribusiness projects with ethnic minorities and projects that have focused on enhancing women's business and production participation in all value chain stages;
- (viii) Demonstrated high quality communications expertise and proven experience with the development of sector performance management systems.

g. Terms of Reference

212. Terms of reference for the Agribusiness Contract Implementation and Supervision Management service provider team positions are presented below.

i. Team Leader/ Agricultural Marketing and Value Chain Expert

213. Main Tasks:

- (i) Provide team leadership to the service provider team, working closely with the HortLangSon Interim Board and in close liaison with the PMU. Establish working relationships with the main Lang Son government departments involved in the horticultural sector;
- (ii) Initiate the establishment of HortLangSon, including assisting the PMU with the appointment of the Interim Board, and initiate sector stakeholder engagement;
- (iii) Act as the HortLangSon Chief Executive Officer for the first two to three years of the project. Assist the Interim Board to recruit a substantive Chief Executive Officer during the third year of the project and subsequently mentor the Chief Executive Officer and other appointed HortLangson staff;
- (iv) As the interim HortLangSon Chief Executive Officer lead the HortLangSon and the Output 3 project interventions and operations;
- (v) In conjunction with the specialist members of the team establish of the HortLangSon core service functions: Trade and Market Logistics; Quality Assurance and Compliance, and; Information and Outreach;
- (vi) Manage the preparation of the HortLangSon first business plan, the horticulture sector strategy and the associated market studies for star anise and safe vegetables;
- (vii) Guide the development of the two representative value chain interventions for star anise and safe vegetables;
- (viii) Guide the implementation of capacity development program for HortLangSon staff (once appointed), commodity groups and agribusiness sector members, farmer producer groups members and departmental staff;
- (ix) Ensure that a suitable and compliant financial management and recording system is established for HortLangSon and the associated Output 3 activities. The HortLangSon board and the PMU will be provided with monthly financial reports and also with monthly fund forecasts;
- (x) Prepare six monthly project reports for the HortLangSon Board and the PMU.

ii. Post-Harvest Systems and Value Chain Expert

214. Main Tasks:

- (i) Coordinate with the Team Leader Team Leader/ Agricultural Marketing and Value Chain Expert over the project's support to improve post-harvest systems in the

- horticulture sector;
- (ii) Review the post-harvest practice by the farmer producer groups for both star anise and vegetables. Propose how the farmer group level post-harvest practice can be improved, and initiate a program to achieve better practice;
 - (iii) Undertake a review of the star anise collectors, traders, processors and marketers to fully assess their post-harvest practice. Based upon this assessment, in association with the Quality Assurance and Compliance Systems Expert, propose how post-harvest practice can be enhanced with the support of the project;
 - (iv) Based upon the star anise assessment develop an information and capacity development program for the star anise value chain members to enhance post-harvest practice;
 - (v) Undertake a post-harvest assessment for the safe vegetable value chain. Based upon this assessment, in association with the Quality Assurance and Compliance Systems Expert, propose how post-harvest practice can be enhanced with the support of the project.
 - (vi) Develop a series of post-harvest training modules for use by the sector members from farmers to processor and marketers, as well as departmental and also extension staff;
 - (vii) Institute post-harvest systems skills and knowledge into the service functions of HortLangSon, including mentoring of HortLangSon staff (once appointed).

iii. Markets and Trade Logistics Expert

215. Main Tasks:

- (i) Assess the status of market and trade data provided to the horticultural sector members by the Department of Industry and Trade (DOIT) and other government departments. Prepare a plan for the HortLangSon role in the provision of this data to sector members, and manage the development of this service – ensure there is regular liaison with the DOIT;
- (ii) Undertake the market analysis for star anise and safe vegetables as part of the horticultural sector strategic assessment. Using the findings from the market assessments assist with the preparation of the business plans for value chain agribusinesses and also farmer producer groups. This task will be undertaken in coordination with the Financing and Grant Management Expert, and Agricultural Producer Groups and Market Linkage Expert.
- (iii) Initiate the market grant program through Commodity Group meetings (star anise and safe vegetables in the initial stages of the project) and other information dissemination methods (in association with the Information Systems and Outreach Expert).
- (iv) Assist the sector agribusinesses to fully utilize market and trade logistics data in their business plans. Assisting and advising the star anise agribusinesses should be a high priority over the first two years of the project;
- (v) In association with the DOIT and the provincial statistics office strengthen the gathering of data on horticulture sector economic performance including the export of horticultural products;
- (vi) Develop a series of market and trade training modules for use by the sector members from farmers to processor and marketers, as well as departmental and also extension staff. Assist in training program delivery;
- (vii) Institute the HortLangSon Market and Trade Logistics service function for the horticultural sector, including mentoring of HortLangSon staff (once appointed).

iv. Quality Assurance and Compliance Systems

216. Main Tasks:

- (i) Assess the status of quality assurance and compliance systems in the horticultural

sector. The initial focus will be upon star anise and safe vegetables. These assessments may be undertaken in conjunction with the Post-harvest Systems and Value Chain Expert;

- (ii) Based upon the quality assurance and compliance systems assessment prepare a plan for the HortLangSon role in quality assurance and compliance systems assessment development in the horticultural sector;
- (iii) Initiate the HortLangSon quality assurance and compliance systems program for the sector. The initial emphasis will be upon star anise with a particular focus upon export markets. Vegetables will also be an early priority. As the various Commodity Groups are formed provide regular quality assurance and compliance systems information the members (in association with the Information Systems and Outreach Expert);
- (iv) Assist and advise horticultural sector agribusinesses to implement enhanced quality assurance and compliance systems;
- (v) Institute the HortLangSon quality assurance and compliance systems core service function for the horticultural sector, including mentoring of HortLangSon staff (once appointed);
- (vi) Develop a series of quality assurance and compliance training modules for use by the sector members from farmers to processor and marketers, as well as departmental and also extension staff. Assist in training program delivery
- (vii) Ensure that there is a close working relationship established with the provincial and national departments responsible for state management quality assurance and compliance systems functions, this includes Department of Science and Technology (DOST) and Department of Agriculture and Rural Development (DARD).

v. Financing and Grant Management Expert

217. Main Tasks:

- (i) Develop an information program (in association with the Information Systems and Outreach Expert) to make horticultural sector members of the Project's grant funding program. Star anise and safe vegetable sector members will be initially the targets of the information program;
- (ii) Prepare the grant funding application formats based upon the information in the Management Implementation Manual;
- (iii) Develop the criteria for the assessment and approval of the grant applications. Provide training and guidance to the various groups that will be responsible for assessing and approving the grant applications;
- (iv) Assist and advise the value chain agribusinesses in the preparation of business plans – the business plans are the basis to support their grant application (this task will be coordinated with other team members);
- (v) Assist with the Agricultural Producer Groups and Market Linkage Expert with the development of the Block Grant program;
- (vi) Assist the Markets and Trade Logistics Expert with the marketing grant program.
- (vii) Manage the preparation for, and implementation of, the innovations grant program. Preparation will include sector consultation to determine the how the innovation grants can be most effectively applied. The initial focus will be upon star anise and the potential for innovations to support star anise product development and processing;
- (viii) Monitor the agribusinesses and farmer producer groups that have received grants and, if necessary, propose how the grant mechanism including investment amount and conditions for use of funds may be improved.

vi. Information Systems and Outreach Expert

218. Main Tasks:

- (i) Initiate the development of the HortLangSon information and horticultural sector

- outreach program;
- (ii) Assist the Team Leader with the initial sector stakeholders' meetings linked to the establishment of HortLangSon and the appointment of the Interim Board;
 - (iii) In association with the Markets and Trade Logistics Expert, the Quality Assurance and Compliance Systems Expert and the Post-harvest Systems and Value Chain Expert develop the HortLangSon information systems to provide sector members with regular and reliable market, trade and quality assurance information;
 - (iv) Assist the Team Leader with the formation of the Commodity groups and initiate a program for regular engagement with the various Commodity Groups (once they are formed) and provide information based upon their demands and needs;
 - (v) Investigate the most effective and efficient method(s) to disseminate information to the horticulture sector. Implement a regular outreach program based upon the findings. The HortLangSon (and Project) outreach program must ensure that both women and male horticultural sector members are provided with information, and that the outreach activities ensure that low literacy and non-kinh speakers are able to access the information provided by HortLangSon;
 - (vi) Assist the team leader to guide the implementation of capacity development program for HortLangSon staff (once appointed), commodity groups and agribusiness sector members, farmer producer groups members and departmental staff
 - (vii) Institute the HortLangSon Information Systems and Outreach core service function for the horticultural sector and mentor HortLangSon staff (once appointed) to take over the Information Systems and Outreach role.

vii. Agricultural Producer Groups and Market Linkages Expert

219. Main Tasks:

- (i) Lead the process to form the various Commodity Groups and assist them to become functional groups representing their producers (in association with the Team Leader and Information Systems and Outreach Expert). The first Commodity Group will be for star anise and based upon the Star Anise Association. The second group will be the safe vegetables Commodity Group.
- (ii) Lead the program to establish the farmer producer groups and assist them to become operational groups. The star anise groups will be the first producer groups to be assisted. The safe vegetable groups will also be assisted as part of the project's support for the first two representative value chains. Ensure that the formation of the groups complies with the project regulations, including the gender requirements;
- (iii) Assist the producer groups to become formally registered entities, and to prepare a business plan for their production and marketing activities. The business plan will include the utilization of the Block Grant funds. Note: the producer group must have an approved business plan to be eligible for project financial support;
- (iv) Assist the farmer producer groups to establish market linkages with retailers, processors or other value chain actors. Note: the producer group must have a formal market relationship to be eligible for project block grant support;
- (v) Assist the farmer producer groups to implement their business plans and use of the block grant funds;
- (vi) Develop a program of technical support for the farmer producer groups aimed at producing high quality safe fruit and vegetables. Oversee the extension services to assist the farmer including the capacity development of district and commune extension services;
- (vii) Oversee the monitoring of farmer producer group performance and provide assistance as required. Project support must focus on market relationships, business plan implementation, group operational effectiveness, as well as crop production;
- (viii) Mentor HortLangSon staff (once appointed) to take over the Agricultural Producer Groups and Market Linkage role.

h. Resources and Roles

220. The following table provides a breakdown of the indicated positions. It is proposed that the successful firm will have a 4-week inception phase to review the ToR. Only the indicated positions will be technically evaluated in the proposal – organizational specialists such as legal advice is not allocated and will be provided on a needs and prior approval basis.

221. Procurement will be by QCBS (90:10) with a full technical proposal.

| Position | Technical Evaluation | Months | Rate | Total |
|------------------------------------|----------------------|------------|--------|------------------|
| Team leader (Agric Marketing) | Yes | 48 | 10,000 | 480,000 |
| Value Chain - Post-Harvest Systems | Yes | 24 | 5,000 | 120,000 |
| Trade / Logistics / Markets | Yes | 24 | 5,000 | 120,000 |
| Quality Assurance / Export Systems | Yes | 24 | 4,000 | 96,000 |
| Finance and Grant Management | Yes | 36 | 3,500 | 126,000 |
| Information Systems / Outreach | Yes | 12 | 3,500 | 42,000 |
| Agronomists/ Producer Groups | Yes | 20 | 3,500 | 70,000 |
| Office Support | No | 90 | 2,500 | 225,000 |
| Finance and Accounting | No | 50 | 3,500 | 175,000 |
| Organization systems (unallocated) | No | 12 | 4,000 | 48,000 |
| Total Fees | | 340 | | 1,502,000 |
| Per Diems | | 9,610 | 50 | 480,500 |
| Office Accommodation | | 50 | 1,500 | 75,000 |
| Office costs | | 50 | 670 | 33,500 |
| Office Equipment sets | | 15 | 600 | 9,000 |
| Transport | | 50 | 4,000 | 200,000 |
| Contingency | | | | 100,000 |
| Indicative cost | | | | 2,400,000 |

4. Independent Auditor Terms of Reference

222. A description of the project will be provided with a focus on: (i) the purpose for which the funds are intended, which is consistent with broad project objectives and budget, (ii) a description of the executing and implementing agencies, (iii) loan amount and project cost (by ADB, co-financier(s), and government counterpart), (iv) accounting and financial management practices, financial reporting periods to be audited (whether it is the first or last audit), and (v) other relevant information that should be brought to the attention of the auditors.

223. **Management's responsibility for preparing project financial statements:** The management is responsible for preparing and fairly presenting the project financial statements, and for maintaining sufficient internal controls to ensure that the financial statements are free from material misstatement, whether due to fraud or error. In addition, management is responsible for ensuring that funds were used only for the purpose(s) of the project, for compliance with financial covenants (where applicable), and for ensuring that effective internal controls, including over the procurement process, are maintained. In this regard, management must:

- (i) Prepare and sign the Project Financial Statements. (**Annex C1**).
- (ii) Prepare and sign a Statement of Compliance. (**Annex C2**)

a. Objectives

224. The objectives of the audit of the project financial statements is to enable the auditor to (i) express an independent and objective opinion as to whether the project financial statements present fairly, in all material respects, or give a true and fair view of the project's financial position, its financial performance and cash flows, and (ii) provide a reasonable assurance opinion over certain specific representations made in the Statement of Compliance. (Refer to Annex C2).

b. Auditing Standards:

225. The audit is required to be conducted in accordance with the Standards promulgated by the International Auditing and Assurance Standards Board (IAASB), including: (i) International Standards on Auditing (ISA); and (ii) International Standards on Assurance Engagements (ISAE). These standards require that the auditor comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the project financial statements are free from material misstatement.

226. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the project financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the project financial statements whether due to fraud or error. In making those risk assessments, the auditor considers the internal control relevant to the entity's preparation and fair presentation of the project financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control.

227. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the project financial statements. The auditor also note the impact on 227. APFS arising from any material deviations from the agreed accounting standards and comment on any accounting policy changes during a financial year or from one year to another.

228. In complying with ISA, the auditor will pay particular attention to the following standards:

- (i) ISA 800: Special Considerations – Audits of Financial Statements Prepared in Accordance with Special Purpose Frameworks. Where the audit report has been issued under ISA 800, it shall include the mandatory Emphasis of Matter paragraph alerting users of the audit report that the project financial statements are prepared in accordance with a special purpose framework and that, as a result, the project financial statements may not be suitable for another purpose. The auditor shall include this paragraph under an appropriate heading;
- (ii) ISA 240: The Auditor's Responsibilities Relating to Fraud in an Audit of Financial Statements;
- (iii) ISA 250: Consideration of Laws and Regulations in an Audit of Financial Statements.
- (iv) ISA 260: Communication with Those Charged with Governance;
- (v) ISA 265: Communicating Deficiencies in Internal Control to Those Charged with Governance and Management; and ISA 330: The Auditor's Responses to Assessed Risks.

c. Audit Deliverables:

- (i) The auditor must verify that the project financial statements have been

prepared under modified-cash basis accounting in accordance with the ADB's reporting requirements as detailed in Annex C1. An auditor's opinion providing reasonable assurance over the project financial statements.

- (ii) The auditor will provide a reasonable assurance opinion following ISAE 3000 "Assurance Engagements other than Audits or Reviews of Historical Financial Information" for the following assertions by Management in the Statement of Compliance (see Annex C2) that:
 - a. the proceeds of the loan were used only for the purpose(s) of the project; and
 - b. the borrower or executing agency was in compliance with the financial covenants of the loan agreement(s), where applicable.

229. The auditor needs to outline the degree of compliance for each of the financial covenants in the loan agreement.

230. Where reasonable assurance has been provided using ISAE 3000 (on the use of loan proceeds and compliance with financial covenants), the assurance report must contain, among others:

- (i) A title that clearly indicates the report is an independent assurance report;
- (ii) An addressee;
- (iii) An identification and description of the subject matter information and, when appropriate, the subject matter;
- (iv) Identification of the criteria;
- (v) A statement that the engagement was performed in accordance with ISAE;
- (vi) A summary of the work performed; and
- (vii) The auditors' conclusion.

231. **Management letter:** The auditor will provide a management letter containing, at a minimum, the following:

- (i) Any weaknesses in the accounting and internal control systems that were identified during the audit, including any irregularity in the use of the advance fund and statement of expenditures (SOE) procedures (where applicable);
- (ii) Any identified internal control weaknesses related to the procurement process such as, over the bidding, evaluation and contract management domains;
- (iii) Recommendations to rectify identified weaknesses;
- (iv) Management's comments on the audit recommendations along with the timeframe for implementation;
- (v) The status of significant matters raised in previous management letters;
- (vi) Any other matters that the auditor considers should be brought to the attention of the project's management; and
- (vii) Details of any ineligible expenditure identified during the audit. Expenditure is considered ineligible if it refers to (i) expenditures incurred for purposes other than the ones intended under the legal agreement(s); (ii) expenditures not allowed under the terms of the legal/financing agreements; and (iii) expenditures incurred in violation of applicable government regulations. If the auditor reports any ineligible expenditure in the management letter, the details of the findings should include the funding source to which the observation relates.

d. Specific Considerations:

232. The auditor will, during the course of the audit, pay particular attention to the following:

- (i) The use of external funds in accordance with the relevant legal and financing agreements;
- (ii) The provision of counterpart funds in accordance with the relevant agreements and their use only for the purposes intended;
- (iii) The maintenance of proper books and records;
- (iv) The existence of project fixed assets and internal control related thereto;
- (v) Project's accounting policies, and confirm the extent to which the agreed project accounting policies have been applied. In particular, the impact on the APFS arising from any material deviations from the agreed accounting standards. Comments on any accounting policy changes, either during a financial year, or from one year to another;
- (vi) On the advance fund procedure (where applicable), audit procedures are planned and performed to ensure (a) the advance account (and any sub-accounts) has been managed in accordance with ADB's Loan Disbursement Handbook, (b) the cash balance of the advance account (and any sub-accounts) is supported by evidence, (c) the expenditures paid from the advance account (and any sub-accounts) comply with the approved project purpose and cost categories stipulated in the loan agreement, and (d) the amount of expenditures paid from the advance account (and any sub-accounts) comply with disbursement percentage stipulated in the loan agreement;
- (vii) On the SOE procedure (where applicable), audit procedures are planned and performed to ensure that (a) the SOEs have been prepared in accordance with ADB's Loan Disbursement Handbook, (b) the individual payments for expenditures stated in the SOE are supported by evidence, (c) the expenditures stated in the SOEs comply with the approved project purpose and cost categories stipulated in loan agreement;
- (viii) (d) the amount of expenditures stated in the SOEs comply with disbursement percentages stipulated in the loan agreement, (e) adequate supporting documentation has been maintained to authenticate claims stated in the SOE for reimbursement of eligible expenditures incurred and liquidation of advances provided to the advance account; and
- (ix) Any weakness in internal controls. Review and evaluate the system of internal controls in effect, including internal audit procedures, to determine the degree of reliance that may be placed upon them and to determine the extent of testing of actual transactions needed to assure the auditor of the accuracy of the accounting records.

233. **Audit Deliverables:** All reports must be presented in the English language within 06 months following the end of the fiscal year. The Auditor's reports on the projects financial statements should be prepared in 08 hardcopies.

234. **Public disclosure:** Public disclosure of the project financial statements, including the auditor's opinion on the audited project financial statements, will be guided by ADB's Public Communications Policy 2011. After review, ADB will disclose the audited project financial statements and the opinion of the auditor on the audited project financial statements no later than 14 calendar days of ADB's confirmation of their acceptability by posting them on ADB's website. The management letter and the additional auditor's opinions will not be disclosed.

235. **Qualifications of Audit Firm:** The following are the requirements on the qualification of auditing firms for auditing ADB funded projects in Viet Nam. It must be authorized to practice in Viet Nam and be capable of applying established procedures and reliable methodology in conformity with ISA and ISAE. The detailed requirements on the qualification of auditing company are:

- (i) Be a legal entity with business license granted by the competent authority, as requested by Vietnamese law; having business registration or set up business in the fields relevant to the requirements of the TORs;
- (ii) Must be impartial and independent from all aspects of management or financial interests in the EA/IA being audited. In particular, the auditor should be independent of the control of the entity;
- (iii) Be included in the most updated list of authorized auditing companies and auditors which is approved by Ministry of Finance and published on website: www.MOF.gov.vn;
- (iv) Have adequate staff, with appropriate professional qualifications and suitable experience in finance/financial management in ODA funded projects or the government projects/ programs, including experience in auditing the Enterprise Financial system (EFS) comparable in nature, size and complexity to the entity whose audit they are to undertake;
- (v) Notify and get written endorsement of the executing agency every time an engagement team member is substituted; and
- (vi) Subcontracting of audit services is not permitted

236. The following are the requirements on the qualification of Individual auditor for each proposed position in the audit: The auditor must be authorized to practice in the country and be capable of applying the agreed auditing standards. The auditor should have appropriate professional qualifications and suitable experience, including experience in auditing the accounts of projects or entities comparable in nature, size and complexity to the project or entity whose audit they are to undertake. To this end, the auditor is required to provide curriculum vitae (CV) of the personnel who will provide the opinions and reports, together with the CVs of managers, supervisors and key personnel likely to be involved in the audit work. These CVs should include details of audits carried out by these staff, including ongoing assignments.

237. The auditor will be impartial and independent from any aspects of management or financial interest in the entity or project under audit. In particular, the auditor should be independent of the control of the entity. The auditor should not, during the period covered by the audit, be employed by, or serve as director for, or have any financial or close business relationship with the entity. The auditor should not have any close personal relationships with any senior participant in the management of the entity. The auditor must disclose any issues or relationships that might compromise their independence.

e. Outline TOR of each position
i. Audit Engagement Partner (X national expert):

238. Holding the highest responsibility for the audit engagement, the Partner will be responsible for:

- (i) Provide directives for the whole audit team from the planning, implementation of the audit and issuing audit opinions.
- (ii) Take responsibility for the overall quality of the audit. Assure the audit is carried out in compliance with the Firm's quality standards and procedures and with the requirements of clients.
- (iii) Developing an understanding of client's business and becoming a "functional expert" in the area.

239. Minimum Qualifications:

- (i) A university graduate (preferably with a post-graduate degree) in accounting,

- auditing, finance, or related fields;
- (ii) Holder of the Audit practitioner certificate granted by the Vietnamese MOF and, preferably, an internationally recognized professional certificate to practice audit or accounting, such as ACCA, CPA Australia, etc.;
- (iii) Professional experience for 15 years or above working in financial, advisory or audit services, with 08 years or more providing audit services since being granted with Vietnamese or international auditor certificate, of which at least 04 years in directing auditing teams;
- (iv) Experience as Audit Director or Partner for at least 03 audit contracts for projects funded by ADB, the World Bank, or large international donors;
- (v) Experience working for a Big4 or large regional accounting firm is a plus; and
- (vi) Fluent English is compulsory.

ii. Audit Manager (X national expert):

240. The Manager will be responsible for:

- (i) Receive the instructional directives from Partner and give detailed guidance to all team members;
- (ii) Monitor the audit fieldwork of engagement team, reviews staff work and ensure that it meet professional standards and the internal audit department's guidelines;
- (iii) Take responsibility for the quality of the audit before submitting to the engagement partner;
- (iv) To be the contact point with project management regarding key issues identified, audit adjustments; and
- (v) Monitor the progress of the audit and monitor the adherence to the committed deadline

241. Minimum Qualifications:

- (i) A university graduate (preferably with a post-graduate degree) in accounting, auditing, finance, or related fields;
- (ii) Holder of the Audit practitioner certificate granted by the Vietnamese MOF and/or an internationally recognized professional certificate to practice audit or accounting, such as ACCA, CPA Australia, etc.;
- (iii) At least 10 years of experience providing audit services, of which 05 years or more in managing the audit team;
- (iv) Audit experience for projects funded by ADB, the World Bank, or large international donors in Vietnam would be an advantage;
- (v) Experience working for a Big4 or large regional accounting firm is a plus; and
- (vi) Fluent English is compulsory.

iii. Senior Auditors (X national experts):

242. The Senior Auditors will be responsible for:

- (i) Follow the instructions from Engagement Partner and Manager;
- (ii) Keep the Partner and Manager updated on the key issues or audit adjustments on a regular basis;
- (iii) Being responsible for the audit quality of the whole team in front of Manager;
- (iv) Being responsible for the compliance with auditing firm quality standards and procedures and with the requirements of this TOR.

243. Minimum Qualifications:

- (i) A university graduate in accounting, auditing, finance, or related fields;
- (ii) Preferably holder of the Audit practitioner certificate granted by the Vietnamese MOF and/or an internationally recognized professional certificate to practice audit or accounting, such as ACCA, CPA Australia, etc.;
- (iii) At least 05 years of experience in providing audit services;
- (iv) Audit experience for projects funded by ADB, the World Bank, or large international donors in Vietnam would be an advantage; and
- (v) English proficiency is preferable.

iv. Junior Auditors (X national experts):

244. The Junior Auditors will be responsible for:

- (i) Implement audit procedures, audit assigned sections in the agencies, be responsible for the data and issues related to the audit engagement;
- (ii) Support the preparation of the audit report; draft the minutes of audit; report to the Audit Seniors regarding the issues related to the audit.

245. Minimum Qualifications:

- (i) A university graduate in accounting, auditing, finance, or related fields;
- (ii) Preferably holder of the Audit practitioner certificate granted by the Vietnamese MOF and/or an internationally recognized professional certificate to practice audit or accounting, such as ACCA, CPA Australia, etc.;
- (iii) At least 02 years of experience working in providing audit services;
- (iv) Audit experience for projects funded by ADB, the World Bank, or large international donors in Vietnam would be an advantage; and
- (v) English proficiency is preferable.

246. **Locations to be audited:** The audit fieldwork shall be carried out in the PMUs. Since the Project is implemented in provinces and districts, the auditors may have to travel to those provinces to do audit and randomly choose the locations to be visited.

247. **Phasing of the Audit:** The TORs must specify when the report will be submitted in draft and in final format.

248. Although the auditing firm will be contracted for the mentioned audit phases (maximum three years per contract), it must submit the financial proposal in US\$ in a format indicating the amount for each financial year independently:

- (i) If performance is not satisfactory in one year then the client will not be bound for subsequent year's audits; and
- (ii) If the performance is satisfactory, the auditor may participate in bidding process for the next fiscal years, but the total assignment should be up to 6 years for one project.
- (iii) The audited phases need to cover the period from loan effective date to the end of 04 - month grace period (if any) succeeding the loan closing date.

f. Available information to be provided to the auditor:

- (i) The auditor should have full and complete access, at all reasonable times, to all records and documents including books of account, legal agreements, bank records, invoices and any other information associated with the project and deemed necessary by the auditor. The auditor will also obtain confirmation of

amounts disbursed and outstanding at ADB. The Auditor shall have the right of access to banks and depositories, consultants, contractors and other persons or firms engaged by the project. In case, access has been restricted, the auditor must note this in the management letter;

- (ii) The auditor will be provided with full cooperation by all employees of the entity and the project implementing units, whose activities involve, or might be reflected in, the annual project financial statements. The auditor will be assured rights of access to banks and depositories, consultants, contractors, and other person or firms hired by the employer; and
- (iii) ADB can request access to the auditors unedited audit working papers. If necessary, the auditing company can be requested, free of charge, to participate in a wrap-up session for the Ministry of Finance (MOF), the EA/IAs and ADB to share common findings across projects being audited and provide recommendations for addressing bottlenecks in preparation for the next audit.

g. Reporting relationships

- (i) The audit services will be contracted by PMU, and the Auditor shall report to: the Project Director and Chief Accountant.

249. The Auditor should maintain and file the work papers and provide them to the Government and/or ADB when requested.

ANNEX C: LONG LIST OF SUBPROJECTS

LANG SON

| No | Subproject | Total Cost | |
|-----|--|-------------------|-------------|
| | | USD \$ | (%total) |
| I | Road subprojects | 37,332,436 | 65.1% |
| 1 | Construction and upgrade of Hoa Tham – Quy Hoa – Vinh Yen road | 15,205,287 | 26.5% |
| 2 | Construction and rehabilitation of Van Quan - Pac Keo road | 5,202,819 | 9.1% |
| 3 | Rehabilitation and upgrade of Tan Van - Binh La road | 6,515,676 | 11.4% |
| 4 | Construction of Khau Ban - Con Quan - Na Lua road | 10,408,654 | 18.2% |
| II | Water supply subprojects | 5,000,000 | 8.7% |
| 1 | Domestic water supply for Cuong Loi inter-commune and Thai Binh farm-town, Dinh Lap district | 1,172,940 | % |
| 2 | Mau Son water supply, Mau Son commune, Cao Loc district | 2,462,799 | 4.3% |
| 3 | Water supply in Tan Van commune, Binh Gia district | 1,364,261 | 2.4% |
| III | Agricultural value chain infrastructure | 15,000,000 | 26.2% |
| | Total | 57,332,436 | 100% |

BAC KAN

| No | Subproject | Total Cost | |
|--------------|--|-------------------|-------------|
| | | USD \$ | (%total) |
| I | Road subprojects | 34,529,119 | 87.0% |
| 1 | Rehabilitation and upgrade of the road connecting from the center of Pac Nam district, Bac Kan province with Son Lo, Bao Lac district, Cao Bang province | 12,440,619 | 31.3% |
| 2 | Rehabilitation and upgrade of the road connecting from the center of Na Ri district, Bac Kan province with Binh Gia and Trang Dinh district of Lang Son province | 12,517,375 | 31.5% |
| 3 | Rehabilitation and upgrade of the road connecting from the center of Thuong An commune, Ngan Son district of Bac Kan province with Hoa Tham commune, Nguyen Binh district of Cao Bang province | 9,571,124 | 24.1% |
| II | Water supply subprojects | 5,173,787 | 13.0% |
| 1 | Water supply system of Boc Bo commune, Pac Nam district, Bac Kan province | 1,775,545 | 4.5% |
| 2 | Water supply system of Van Tung commune, Ngan Son district, Bac Kan province | 2,084,339 | 5.2% |
| 3 | Expand the network of water supply works in Cho Moi and Bach Thong districts, Bac Kan province | 1,313,903 | 3.3% |
| Total | | 39,702,906 | 100% |

Ha Giang Province

| NO | Subproject | Total cost | |
|----|--|------------|----------|
| | | USD \$ | (%total) |
| I | Road subprojects | 33,976,000 | 86% |
| 1 | Upgrade and rehabilitation of the road from Dong Tam, Bac Quang district to Ngoc Linh, Vi Xuyen district, Ha Giang | 13,698,406 | 35% |
| 2 | Upgrade and rehabilitation of the road from Ha Giang city to Binh Vang industrial park. | 12,146,363 | 31% |
| 3 | Upgrade and rehabilitation of the road Yen Minh -Mau Due - Meo Vac | 8,131,231 | 21% |

| NO | Subproject | Total cost | |
|--------------|--|-------------------|-------------|
| | | USD \$ | (%total) |
| II | Water supply subprojects | 5,654,000 | 14% |
| 1 | Building the clean water supply system in Vinh Quang town and the neighboring communes such as Tu Nhan, Ban Nhung, Hoang Su Phi district, Ha Giang | 2,442,649 | 6% |
| 2 | Building the clean water supply system in Coc Pai town and the neighboring communes such as Nam Dan, Ban Ngo, Xin Man district, Ha Giang | 3,211,351 | 8% |
| Total | | 39,630,000 | 100% |

Cao Bang Province

| NO | Subproject | Total Cost | |
|--------------|--|-------------------|----------|
| | | USD \$ | (%total) |
| I | Road subprojects | 39,800,147 | 92% |
| 1 | Upgrading and improving provincial road 211 (Trung Khanh - Tra Linh), Cao Bang province | 12,625,837 | 29% |
| 2 | Provincial road 206 (Dam Thuy commune, Trung Khanh district) - Ly Van border gates (Ly Quoc commune, Ha Lang district), and Dong May bridge, Binh Long Bridge (Road 216) | 18,522,890 | 43% |
| 3 | Upgrading and improving roads of Tinh Tuc - Phan Thanh - Mai Long, Nguyen Binh district, Cao Bang province | 8,651,419 | 20% |
| II | Water supply subprojects | 3,365,853 | 8% |
| 1 | Water supply system for domestic use for Xuan Hoa town, Phu Ngoc commune, Ha Quang district | 2,240,088 | 5% |
| 2 | Water supply system for Pac Mau town, Bao Lam district | 1,125,765 | 3% |
| Total | | 43,166,000 | |

Table C. 1: Summary of Proposed Output 1 Subprojects

| Output 1: Road Network Connectivity improved | | | | | |
|---|--|--|---|---|-----------------------------|
| Description | Bac Kan | Cao bang | Ha Giang | Lang Son | Total |
| Name Representative | i) Upgrade and improve road connecting from the center of Pac Nam district, Bac Kan province to Son Lo, Bao Lac district, Cao Bang province | i) Upgrading and improving provincial road 211 (Trung Khanh - Tra Linh), Cao Bang province (28km) | i) Improving road from Dong Tam commune, Bac Quang District to Ngoc Linh Commune, Vi Xuyen District (25.01km) | i) Construction and upgrade of Hoa Tham – Quy Hoa – Vinh Yen road –road 61 | 4 |
| Name Additional | ii) Two section Na Ri District (20.471km) iii) Upgrade and improve road connecting from the center of Thuong An commune, Ngan Son district, Bac Kan province to Hoa Tham commune, Nguyen Binh district, Cao Bang province (10.50km) | ii) Provincial road 206 (Dam Thuy commune, Trung Khanh district) - Ly Van border gates (Ly Quoc commune, Ha Lang district), and Dong May and Binh Long Bridges (Road 216) (27.75km) iii) Upgrading and improving roads of Tinh Tuc - Phan Thanh - Mai Long, Nguyen Binh district, Cao Bang province – Pac Nam (Bac Kan Province) (29km) | ii) Improving road from Ha Giang city to Binh Vang industrial zone (20.517km) iii) Improving route Yen Minh - Mau Due - Meo Vac (22.9km) | (ii) Van Quan - Pac keo Rd (10,653) (iii) Tan Van - Binh La Rds (11.321km) (iv) Khau Ban Con Quan Na Lua Rd (19.22km) | 9 |
| Total Number | 3 | 3 | 3 | 4 | 13 |
| Length Representative (km) | 23.1 | 28 | 25.01 | 22.95 | 99.15 |
| Length Additional (km) | 30.97 | 56,75 | 43.417 | 39.601 | 169.64 |
| Total Length (km) | 54.07 | 84 | 68.427 | 62.551 | 270.32 |
| No. of Beneficiaries - Representative | 7,644 | 23,476 | 12,850 | 6,376 | 50,346 |
| No. of Beneficiaries – Additional | 17,662 (4,415 HHs) | 22,510 (5,627 HHs) | 44,173 (9,512 HHs) | 25,301 (6,325 HHs) | 109,646 (27,411 HHs) |
| Total | 25,306 | 45,986 | 57,023 | 31,677 | 159,992 |

| Output 1: Road Network Connectivity improved | | | | | |
|---|----------------|-----------------|-----------------|-----------------|--------------|
| Description | Bac Kan | Cao bang | Ha Giang | Lang Son | Total |
| Beneficiaries | | | | | |

Table C.2: Summary of Proposed Water Supply Subprojects

| Output 2: Water supply | | | | | |
|---|---|---|---|--|---------------|
| | Bac Kan | Cao Bang | Ha Giang | Lang Son | Total |
| Number of representative subproject | 1 | 1 | 1 | - | 3 |
| Number of additional subproject | 2 | 1 | 1 | 3 | 7 |
| Total Number of Subproject | 3 | 2 | 2 | 3 | 10 |
| A: Representative Subprojects | | | | | |
| Representative Subproject | Construct Water supply for the center of Boc Bo commune, Pac Nam district | Construct water supply system for domestic use for Xuan Hoa town, Phu Ngoc commune, Ha Quang district | Construct the clean water supply system in Vinh Quang town and the neighboring communes such as Tu Nhan, Ban Nhung, Hoang Su Phi district, Ha Giang | - | - |
| Project Daily Water Capacity (m ³ per day) | 1,300 | 2,000 | 2,200 | - | 5,500 |
| Number of beneficiary households supplied | 1072 | 2,173 | 2,045 | - | 5,290 |
| Total beneficiary Population supplied | 3,962 | 8,045 | 8,263 | - | 20,270 |
| B: Additional Subprojects | | | | | |
| | Bac Kan | Cao Bang | Ha Giang | Lang Son | Total |
| Name | ii) Water supply for the center of Van Tung commune, Ngan Son district iii) Widen water supply network of Cho Moi and Pho Thong districts Bac Kan province | ii) Construct water supply system for Pac Mau town, Bao Lam district | ii) Construction and expansion of the water supply system in Coc Pai town and Nam Dan, Ban Ngo communes, Xin Man District | i) Domestic water supply for Cuong Loi inter-commune and Thai Binh farm-town, Dinh Lap district ii) Mau Son water supply, Mau Son commune, Cao Loc district iii) Water | |

| Output 2: Water supply | | | | | | | |
|---|-------------------------|-----------------|-----------------|--|---------------|--|--|
| | Bac Kan | Cao Bang | Ha Giang | Lang Son | Total | | |
| | | | | supply in Tan Van commune, Binh Gia district | | | |
| Project Daily Water Capacity m ³ per day | ii) 1,400 iii) 1,000 | 1,700 | 2,600 | i) 1,600 ii)4,623 iii)1,200 | 14,123 | | |
| Number of households supplied | ii) 1,170 iii)1,442 | 1,296 | 3,176 | i) 1,000 ii) 1,029 iii)714 | 9,827 | | |
| Total Population supplied | ii) 4,200 iii) 5,769 | 5,185 | 11,508 | i) 4,400 ii)4,623 iii) 3,801 | 39,486 | | |
| Output 2: Summary | | | | | | | |
| Number of subprojects | 2 | 1 | 1 | 3 | 7 | | |
| Total water delivered (m ³ per day) | 2,400 | 1,700 | 2,600 | 7,423 | 14,123 | | |
| Total Population | 9,969 | 5,185 | 11,508 | 12,824 | 42,279 | | |
| Total HH | 2,612 | 1,296 | 3,176 | 2,743 | 9,827 | | |

ANNEX D: PROPOSED SUBPROJECT PLANNING TEMPLATE

| Prov: | Cost Estimates (VND mil.) | | | Implementation Status | Detailed Implementation Plan | | | Progress Report Status Update - Q** 20** | | | |
|---|---------------------------|----------|---------|--|---|----------|-------------------------------------|--|--------------|--------|--|
| Subproject: | Total | ADB Loan | C. Fund | | Task | Deadline | Project Management Service Standard | Implementation Vs Planning | | | |
| Output 1: | | | | | | | | Achieved | Delayed | Action | |
| | | | | | | | | Yes/No | Revised date | | |
| Rehabilitation and upgrade of the road connecting from the center of Pac Nam district, Bac Kan province with Son Lo, Bao Lac district, Cao Bang province | | | | | | | | | | | |
| Feasibility Reports for Additional Subproject FS | | | | | Preliminary design prepared by Provincial Consultant | | | before loan signing | | | |
| | | | | | Land Acquisition surveys completed | | | | | | |
| | | | | | Subproject REMDP prepared | | | | | | |
| | | | | | Environmental Examination and IEE /EIA prepared | | | | | | |
| | | | | | Social and Poverty Assessments and Gender Action Plan prepared with baseline data | | | | | | |
| | | | | | Subproject Financial and Economic assesment | | | | | | |
| | | | | | FS report prepared by Provincial Consultant | | | | | | |
| | | | | FS reviewed by PMU/DPI | | | | | | | |
| Feasibility Reports for Representative / and Additional Subprojects | | | | Prepared during PPTA | FS updated by provincial consultant | | 14 days | | | | |
| | | | | | FS endorsed by PMU/PPC submitted to ADB | | 14 days | | | | |
| | | | | | Implementation plan submitted to PMU by consultant | | 7 days | | | | |
| | | | | | Implementation plan reviewed by PMU | | 5 days | | | | |
| | | | | | Implementation plan revised and resubmitted to PMU | | 7 days | | | | |
| | | | | | Implementation plan Approved by PMU submitted PPC | | 30 days | | | | |
| Detailed Engineering Design | | | | | ToR for Detailed Design Prepared | | PPSFF | | | | |
| | | | | | DED TOR Approved | | 30 days | | | | |
| | | | | | Bidding documents prepared submitted to DPI | | 14 days | | | | |
| | | | | | Bidding document approved by DPI | | 5 days | | | | |
| | | | | | Advertisement in newspapers | | 3 days | | | | |
| | | | | | Proposal submitted to PMU by firms | | 3 weeks | | | | |
| | | | | | Technical proposal evaluated by PMU | | 10 days | | | | |
| | | | | | Technical evaluation approved by DPI | | 3 days | | | | |
| | | | | | Financial Proposals public opening by PMU | | 2 days | | | | |
| | | | | | Financial Proposals evaluated by PMU | | 5 days | | | | |
| | | | | | Financial Evaluation results approved by DPI | | 3 days | | | | |
| | | | | | Contract signing PMU - consultants | | 7 days | | | | |
| | | | | | Advance Payment (20% completed by PMU) | | 7 days | | | | |
| | | | | | Technical Design completed by consultant | | 90 days | | | | |
| | | | | | Technical design appraised by independent consultant | | 30 days | | | | |
| | | | | | Technical edsign revied and commented by LIC | | 14 days | | | | |
| | | | | | Design revisions by consultant | | 14 days | | | | |
| | | | | | Revised design endorsed by PMU/LIC | | 14 days | | | | |
| | | | | Technical design appraised by DPI | | 3 month | | | | | |
| | | | | Technical design approved by PPC | | 14 days | | | | | |
| | | | | Payment up to 90-% of contract value | | 7 days | | | | | |
| | | | | Last paymentof 10% to consultant by PMU | | | | | | | |
| Land Acquisition and Resettlement | | | | | Contract signed between PMU and CLD | | | | | | |
| | | | | | Inventory completed by CLD | | 30 days | | | | |
| | | | | | Compensation plan prepared by CLD | | 30 days | | | | |
| | | | | | Compensation plan publiced by CLD | | 30 days | | | | |
| | | | | | Compensation plan approved by CPC | | 30 days | | | | |
| | | | | | REMDP updated by LIC | | 14 days | | | | |
| | | | | | Updated REMDP submitted by CPMU to ADB | | 7 days | | | | |
| | | | | | Comment of ADB for updated REMDP provided to PMU | | 7 days | | | | |
| | | | | | REMDP finalized LIC & resubmitted by PMU to ADB | | 7 days | | | | |
| | | | | | Updated REMDP approved by ADB | | 7 days | | | | |
| | | | | | Compensation delivered by CLD and PMU | | 3 weeks | | | | |
| | | | | | LIC checked and submitted report to ADB | | 30 days | | | | |
| | | | | Last payment (10%) done by PMU to inventory consultant | | 30 days | | | | | |

| Prov: | Cost Estimates (VND mil.) | | | Implementation Status | Detailed Implementation Plan | | | Progress Report Status Update - Q** 20** | | |
|--|---------------------------|-------|----------|--|--|------|----------|--|----------------------------|--|
| | Subproject: | Total | ADB Loan | | C. Fund | Task | Deadline | Project Management Service Standard | Implementation Vs Planning | |
| Achieved Yes/No | | | | Delayed Revised date | | | | | Action | |
| Output 1: | | | | | | | | | | |
| Rehabilitation and upgrade of the road connecting from the center of Pac Nam district, Bac Kan province with Son Lo, Bao Lac district, Cao Bang province | | | | | | | | | | |
| Construction supervision consultant (across all subprojects) Procurement stats within 1 month of Loan Stgning | | | | | Procurement based on draft BD's prepared by PPTA | | | 7 days | | |
| | | | | | BDs revised updated sbrmit by PMU to DPI | | | 10 days | | |
| | | | | | BDs approved by DPI | | | 7 days | | |
| | | | | | BD/ToR forwarded to ADB for CMS uploading (STP) | | | 3 days | | |
| | | | | | CMS uploading by ADB | | | 21 days | | |
| | | | | | Proposals submitted by consulting firms forwarded to PMU | | | 3 weeks | | |
| | | | | | Technical proposals evaluated by PMU | | | 10 days | | |
| | | | | | Technical evaluation results approved by PMU/DPI | | | 5 days | | |
| | | | | | Financial proposals opened publicly by PMU | | | 7 days | | |
| | | | | | Financial proposals evaluated by PMU | | | 7 days | | |
| | | | | | Financial evaluation results approved by DPI | | | 10 days | | |
| | | | | | Contract signed between PMU and consutants | | | 30days | | |
| | | | | | Advance payment (20% of contract) done by PMU | | | 1 year | | |
| | | | | | Second payment (20% of contract) done by PMU | | | 1 year | | |
| | | | | | Third payment (20% of contract) done by PMU | | | 1 year | | |
| | | | | | Fourth payment (20% of contract) done by PMU | | | 60 days | | |
| | | | | | Contract expired | | | 300 days | | |
| | | | | | Last payment (20% of contract) done by PMU | | | | | |
| Civil works | | | | | Bidding documents prepared by DED consultant | | | 7 days | | |
| | | | | | Bidding documents submitted by PMU to DPI | | | 2 weeks | | |
| | | | | | Bidding documents submitted by DPI to ADB | | | 2 weeks | | |
| | | | | | Bidding documents commented by ADB | | | 7 days | | |
| | | | | | Revised bidding documents submitted by DPI to ADB | | | 7 days | | |
| | | | | | Final bidding documents approved by ADB | | | 5 days | | |
| | | | | | Bidding documents approved by DPI/PPC | | | 10 days | | |
| | | | | | Advertisement placed on ADB website/newspapers | | | 30 days | | |
| | | | | | Bid opening ceremony organized by PMU | | | 45 days | | |
| | | | | | Bid evaluation completed by PMU | | | 7 days | | |
| | | | | | BER submitted by PMU to DPI | | | 30 days | | |
| | | | | | BER submitted by CPMU to ADB | | | 2 weeks | | |
| | | | | | BER reviewed and commented by ADB | | | 30 days | | |
| | | | | | BER revised by PMU and resubmitted by DPI to ADB | | | 7 days | | |
| | | | | | Revised BER approved by ADB | | | 10 days | | |
| | | | | | BER approved by DPI | | | 10 days | | |
| | | | | | Contract signed by PMU and contractor | | | 30 days | | |
| | | | | | Advance payment (20% of contract) done by PMU | | | 90 days | | |
| | | | | | Second payment (20% of contract) done by PPMU | | | 120 days | | |
| | | | | | Third payment (20% of contract) done by PPMU | | | 120 days | | |
| | | | | Fourth payment (10% of contract) done by PPMU | | | | | | |
| | | | | Civil works completed by the contractor | | | 30 days | | | |
| | | | | Quality of civil works checked by consultant | | | 31 days | | | |
| | | | | Civil works handed over to the end user | | | 31 days | | | |
| | | | | Fifth payment (15% of contract) done by PPMU | | | 365 days | | | |
| | | | | Warranty payment (5% of contract) done by PPMU | | | | | | |

| Prov: | Cost Estimates (VND mil.) | | | Implementation Status | Detailed Implementation Plan | | | Progress Report Status Update - Q** 20** | | |
|--|---------------------------|----------|---------|-----------------------|--|----------|-------------------------------------|--|--|--|
| Subproject: | Total | ADB Loan | C. Fund | | Task | Deadline | Project Management Service Standard | Implementation Vs Planning | | |
| Output 1: | | | | | | | | | | |
| Rehabilitation and upgrade of the road connecting from the center of Pac Nam district, Bac Kan province with Son Lo, Bao Lac district, Cao Bang province | | | | | | | | | | |
| Subproject planning and implemetnation activities | | | | | FS appraisal fees | | | | | |
| | | | | | Last payment done for TOR & cost estimates for FS | | | | | |
| | | | | | Last payment done for FS monitoring survey | | | | | |
| | | | | | Appraisal fee for feasibility of investment | | | | | |
| | | | | | Last payment done for preparation of EIA | | | | | |
| | | | | | TOR & cost estimates for technical design | | | | | |
| | | | | | RFP preparation | | | | | |
| | | | | | Detailed design monitoring survey | | | | | |
| | | | | | Appraisal consultant of detailed design & cost estimates | | | | | |
| | | | | | Appraisal fees for detailed design & cost estimates | | | | | |
| | | | | | BD preparation & assessment & appraisal fees | | | | | |
| | | | | | Last payment done for English translation fee | | | | | |
| | | | | | Evaluation results appraisal fees | | | | | |
| | | | | | Monitoring and assessment fee for investment | | | | | |
| | | | | | Quality of civil works checked by consultant | | | | | |
| | | | | | Document file fee | | | | | |
| | | | | | Others | | | | | |
| Subproject audit | | | 0 | Not yet due. | Subproject audit completed | | | | | |
| Subproject liquidation | | | 0 | Not yet due. | Subproject liquidation completed | | | | | |
| Subtotal | 0 | 0 | 0 | | Subproject Completion Date | | | | | |

ANNEX E: INDICATIVE PROGRESS REPORT – TABLE OF CONTENTS

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|--|------|
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ANNEX F: GAP MONITORING TABLE

Project/Loan number: yyyy

Project title: xxxxxxx

Date of report or cut-off date of report:

| Gender strategy | Target/action | Progress to - date | Issues/ recommendations. |
|------------------------|-------------------------------|---------------------------|---------------------------------|
| Output 1 | | | |
| | A1.1. T1.1. ... | | |
| Output 2 | | | |
| | A2.1 T2.1. T2.2. ... | | |
| Output 3 | | | |
| | A3.1 ... | | |
| Output 4 | | | |
| | | | |

ANNEX G: OUTPUT 3

G.1. Detailed Design Summary

| Narrative | Notes | Indicators | Risks |
|---|-------|--|---|
| Outcome | | | |
| <p>Improved horticultural sector economic performance through a coordinated industry led business and market focused strategy for sector growth and development that features market driven product value chains aimed at added value "export" markets, encourages investment in sector industries, prioritises quality assurance, achieves strong business relationships between value chain actors, and where income for all actors, including women and men farmers, is increased. The value chain development will enhance inclusive growth along the chain and provide increased economic opportunities for ethnic minorities and women that will enhance their empowerment.</p> | | <p>Increase in Lang Son horticultural sector economic output (total, %)</p> <p>Increase in value of exports by horticultural sector products (total, %)</p> <p>Increase in horticultural sector investment for processing, facilities, production and market development (total, %)</p> <p>Number of product value chains with contracts between members (Number, %)</p> <p>Increase in farmer income for selected products: star anise, vegetables (total, %)</p> <p>Number of women members of farmer groups (number per group, %)</p> | <p>Export market demand for agro-food products is influenced by difficulties with trade agreements</p> <p>Horticulture sector product growth and development prospects are limited to due low competitiveness and weak market opportunities</p> <p>Horticulture sector members do not the support the formation of HortLangSon</p> <p>Low interest by investors the horticulture sector</p> <p>Farmers do not agree to form farmer groups</p> <p>Small and medium collectors do not join product groups</p> <p>Women are constrained by multiple duties from participation in farmer groups</p> |
| Output 3.1: Horticultural Sector Industry Organization | | | |
| <p>Objective: To develop a horticultural sector industry organisation that will be responsible for strategic sector planning and oversight, enhanced quality control standards, trade relationship and compliance, and representing the product sector members.</p> | | | |
| Activities | | | |

| Narrative | Notes | Indicators | Risks |
|--|--|--|---|
| 3.1.1 Implementation and Contract Supervision Service Provider appointed | PMU contracts the Service Provider (Advance Action) | Service provider contracted | No suitably qualified service providers based in Viet Nam |
| 3.1.2 HortLangSon Board and Sector Transformation group appointed | HortLangSon interim Board of private sector and government department representatives appointed and | HortLangSon formation approved by PPC Legal documents completed | Not enough suitably experienced private sector members to be appointed to the interim Board |
| 3.1.3 Horticulture sector strategic plan (HSSP), and associated business plan prepared | HSSP will provide the basis for sector development and the main products. Market plans will also be prepared first for star anise and vegetables. Subsequent market plans will be prepared for the other priority products that have been identified in the sector strategy. Sector strategic plan will identify potential investment areas with a plan to encourage outside investment | Number of sector groups meetings conducted (Number of participants per meeting, gender disaggregated %) Business Plan approved by interim Board Sector Strategic and Market Plan approved by interim Board | Participation of sector members, including women, in meetings is low |
| 3.1.4 HortLangSon Secretariat established and operational | Service provider will be responsible for developing the role of HortLangSon, its Secretariat, and technical services to support the product value chain development. Activities 3.1.7, 3.1.8 & 3.1.9. | Secretarial Operational Core service functions initiated | Delays in providing services |
| 3.1.5 Product groups formed and operational | Form separate Product groups based on the main horticulture products, and use as the basis for product development activities. Assist Product groups to develop their roles and become active in sector activities and development | Product group formed (Number, % women members) | Sector members do not understand the merits of Product groups and do not participate |
| 3.1.6 Competitive funding mechanism established | Viability gap grants for enterprises: (i) sector level strategic grants for agri-enterprises; (ii) enterprise grants; (iii) smaller agri-enterprise grants, and; market | Competitive funding regulations approved Number of investment proposals | Sector agro-businesses, product groups and farmer groups are slow to apply for grants |

| Narrative | Notes | Indicators | Risks |
|--|--|---|--|
| | development grants. Women entrepreneurs encouraged and supported to apply for funds | submitted and approved (number, %) Number of funding applications by women led businesses (%) | |
| 3.1.7 Trade, markets and quality information and support provided to members | HortLangSon provides support and information to members about trade, markets and quality requirements for export markets Women entrepreneurs encouraged and supported to apply for marketing grants | No. of requests for trade information (number, % women) No. of requests for market information (number, % women) | Low demand for information by sector members |
| 3.1.8 Quality assurance and compliance systems established | For sector awareness and to institute quality systems for products (standards, traceability, QR etc systems) | Sector quality awareness program Quality assurance system established for first product | Product value chain members are reluctant to accept and institute quality assurance standards and system |
| 3.1.9 Sector outreach and education | Increase information sharing and increase awareness and knowledge of sector product group members and their value chains. Activities under 3.1.8 are where all the capacity development, extension and communications will be delivered. The scope of these is wide ranging and aligned with what is required to ensure that an inclusive agribusiness approach is applied. Learning needs will be formally assessed once implementation commences and the main theme areas will include: governance of sector organisations; business planning and management; quality assurance; marketing; and modern horticultural production techniques. Communications will actively target all sector members especially women and men farmers, and commune | For capacity building activities: skills and knowledge learned and applied (participants, number of women (%)) Project information from campaigns received by stakeholders (number, % women) Number of LURCs modified to include women on title | Outreach programs are poorly targeted and do not use methods to effectively communicate with all sector members Communication methods used are not inclusive |

| Narrative | Notes | Indicators | Risks |
|--|---|---|--|
| | and district smaller scale agribusinesses. The program will also include awareness over joint title LURCs | | |
| 3.1.10 Design and implement system to monitor and assess sector performance | Establish system that enables sector and product performance to be proactively monitored Gender disaggregated data | Sector performance reported semi-annually interim Board and PPC | Sector members unwilling to provide information due to commercial sensitivity |
| Output 3.2: Star Anise Value Chain Development | | | |
| Objective: Market orientated star anise value chain developed that markets star anise spice and oil products that comply with international quality assurance standards ²⁴ to export markets and provides increased financial income to all value chain members | | | |
| Activities | | | |
| 3.2.1 Prepare plan for star anise value chain development | Prepared by HortLangSon | Star anise value chain development plan prepared Number of sector groups meetings conducted (Number of participants, gender disaggregated %) | Market analysis shows that the market prospects are weak Low cooperation by chain members aligned to Chinese traders and processors |
| 3.2.2 Implement star anise value chain development plan | Businesses and farmer groups assisted to prepare business plans. Conditionality for all project investment assistance will be a business plan | Main development plan tasks implemented (define measures based upon development plan) No. of business plans for farmer groups No. of business plans for collectors and processors | Businesses and farmers do not understand the purpose of business plans |
| 3.2.3 Assist farmer group formation and operations | HortLangSon to form farmer groups and assist their operations and provide technical | Groups formed (number., females, males) | Some farmers unwilling to work in groups Women farmers not |

²⁴ Benchmark will be United States Food Safety Modernisation Act 2011

| Narrative | Notes | Indicators | Risks |
|---|---|--|--|
| | production assistance Conditionality for group Project support is that they agree to operate as a group that shares project provided resources, and establish a contractual relationship to supply star anise to a Viet Nam based processor. | Groups with women leaders (number, %) | included in groups |
| 3.2.4 Farmer groups assisted with production and marketing advice | HortLangSon will assist farmer groups with technical production aspects | Group production and income (per season, per farmer (kg & \$)) Number of training courses per group (% men, women) | Farmer unwilling to invest in, and adopt, new production techniques |
| Output 3.3: Vegetable Value Chain Development | | | |
| Objective: Lang Son farmer groups producing “certified safe” vegetables for sale under business relationship to supermarkets and specialist vegetable retailers | | | |
| Activities | | | |
| 3.3.1 Prepare plan for vegetable value chain development (based on satisfactory market assessment) | Prepared HortLangSon and includes marketing plan | Vegetable value chain development plan prepared Number of sector groups meetings conducted (Number of participants, gender disaggregated %) | Low participation by vegetable farmers in vegetable sector consultations |
| 3.3.2 Implement vegetable value chain development plan | HortLangSon will coordinate with PPMU. All vegetable farmer groups will be assisted to prepare a business plan. | Main development plan tasks implemented (define based upon development plan) | Market analysis shows that the market prospects are weak Low number of vegetable farmers want to intensify their production systems |
| 3.3.3 Establish farmer groups and assist their operations, and technical market assistance | Farmer groups selected and formed. Conditionality for group Project support is that they agree to operate as a group that shares project provided resources, and establish a contractual relationship to supply safe vegetables to | Farmer groups with a business plan Groups formed (Number, women members, men members %) Groups with women leaders (number, %) | Farmers have limited experience of working in groups Low numbers of women in the groups |

| Narrative | Notes | Indicators | Risks |
|--|---|---|---|
| | supermarkets | | |
| 3.3.4 Farmer groups assisted with production and marketing advice | HortLangSon will assist farmer groups with technical production aspects | <p>Increases in vegetable production (yield - kg) of selected crops)</p> <p>Increase in income per season (crop, \$)</p> <p>Number of training courses per group (% men, women)</p> | Farmer unwilling to invest in, and adopt, new production techniques |
| Output 3.4: Other Product Value Chain Development | | | |
| Product value chains developed marketing products that comply with international quality assurance standards to export markets and provide increased financial income to all value chain members | Other product value chain developments will occur only after the star anise and vegetable value chains have developed and operational for two years. | | |
| Activities | | | |
| 3.3.1 Prepare plan for product value chain development (based on satisfactory market assessment) | Prepared HortLangSon and includes marketing plan | <p>Product value chain development plan prepared</p> <p>Number of sector groups meetings conducted (Number of participants, gender disaggregated %)</p> | |
| 3.3.2 Implement product value chain development plan | Product group businesses and farmer groups will be assisted to prepare a business plan – this will be a conditionality for Project investment assistance. | <p>Main development plan tasks implemented (define measures based upon development plan)</p> <p>Product Group businesses and farmer groups business and market plan prepared</p> | |
| 3.4.3 Establish farmer groups and assist their | Conditionality for group Project support is that | Groups formed (number., | |

| Narrative | Notes | Indicators | Risks |
|---|---|--|-------|
| operations, and provide technical market assistance | they agree to operate as a group that shares project provided resources, and establish a contractual relationship for the supply of their product | females, males) Groups with women leaders (number, %) | |
| 3.4.4 Farmer groups assisted with production and marketing advice | HortLangSon will assist farmer groups with technical production aspects | Increases in production (yield - kg) of selected crops) Increase in income per season (crop, \$) Number of training courses per group (% men, women) | |

G.2. Output 3 Implementation Manual

I. Introduction

250. This Management Manual (Manual) has been prepared to guide the implementation management of Output 3: Agricultural Value Chain Infrastructure in the Basic Infrastructure for Inclusive Growth in the Northeastern Provinces Sector Project (BIIG 1) in Lang Son province. Output 3 features a market led agribusiness approach to development of Lang Son's horticultural sector. that includes innovations that the Project Management Unit (PMU) and provincial agencies have limited experience and knowledge of.

251. The Manual guides project implementation staff and decision makers to fulfil management roles and functions. These include:

- (i) PPC that is the Project Executing Agency
- (ii) PMU that will be based in Lang Son Department of Planning and Investment (DPI);
- (iii) Service Provider contracted to support Output 3 implementation and supervision;
- (iv) Lang Son provincial government departments: Department of Planning and Investment (DPI), Department of Agriculture and Rural Development (DARD); Department of Science and Technology (DOST), Department of Trade and Industry (DOIT);
- (v) District Peoples' Committees (DPC), their divisions, and other service units;
- (vi) Commune Peoples Committees;
- (vii) Beneficiary Producer Groups²⁵ formed under Output 3;
- (viii) Product groups²⁶ consisting of horticultural industry private sector members.

252. The Manual forms part of the PAM.

A. Overview of Manual Sections

253. This Manual consists of eight sections (including this Introduction) and five appendices:

| Section I: Introduction | |
|---|--|
| All Manual Users | Introduces the Manual, and describes the content of each section. |
| Section II: Output 3 Description and Management Structure | |
| This section is intended for everyone taking part in implementing Output 3 | Readers can find in Section II an overview of the design of the Output, the management structure and a summary of the main implementation management responsibilities of all involved agencies from the Lang Son Provincial Peoples' Committee (PPC) to the Commune Peoples' Committee |
| Section III: Output 3 Implementation Management Responsibilities | |
| This section is intended primarily for the PMU and HortLangSon, departments, districts and communes | The section presents the main Output 3 implementation roles and responsibilities of PMU and HortLangSon, and their staff, and by the departments, districts and communes. It also provides a background on the role and functions of HortLangSon. |
| Section IV: Output 3 Implementation | |

²⁵ Producer Groups refers to small farmers groups that have been formed to develop their farm production business, and to established market linkages

²⁶ Product Groups consist of product sector members: producers, processors, traders, service providers and retailers, with a particular emphasis upon women members. Producer Groups will be members of the relevant sector Product Group.

| | |
|--|--|
| Section IV is intended for all agencies and staff involved in Output 3 implementation. | Readers will find the description of the implementation of all the Output 3 activities. It also provides comments and some key factors that need to be noted during implementation. |
| Section V: Product Groups and Producer Groups | |
| Section V is intended for the PMU, HortLangSon, District agencies and Commune People's Committee. | Formation of the Product Groups and Producer Groups is described along with the key features that must be applied in the formation process |
| Section VI: Competitive Grants | |
| Section VI is intended for the PMU and HortLangSon who will be responsible for managing the competitive grant program. | Readers will find the description of the competitive grant program that provides Viability Gap Grants for Agri-enterprises, Producer Groups, as well as marketing grants and Product group grants. The section describes the background each of the grants, how the grant process is to be managed, including their evaluation, as well as notes to guide the grant management process. The separate grant management roles of the PMU and HortLangSon are also described. |
| Section VII: Gender | |
| Intended for all readers | The section describes how the Output 3 gender mainstreaming approach will be applied, the GAP targets and actions, and key gender task areas for HortLangSon and the PMU. |
| Section VIII Performance Monitoring and Reporting | |
| Section VIII is intended for all staff involved in Output 3 management and implementation from the PMU to the Producer Groups. | The section outlines the roles in performance recording and in reporting |

II. Output 3 Description, Management Structure and Roles

254. This section is aimed at the staff in the provincial and district agencies, units and departments involved in implementing and managing Output 3, including:

- (i) PMU
- (ii) HortLangSon Service Provider
- (iii) Departments
- (iv) District: DPC, divisions and service units
- (v) Officials at commune level
- (vi) Beneficiaries: farm producer group leaders and members

A. Contents of this Section

255. Chapter II presents two major contents:

- (i) Overview of Output 3
- (ii) Output 3 Management Structure and Management Structure Diagram
- (iii) A summary outline of the management roles of each agency involved in Output 3

B. Output 3 Overview

1. Design Structure and Activities

256. Output 3 will contribute to the BIIG 1 Impact of closer economic connectivity enhancing the subregional competitiveness of the Four North Eastern Provinces²⁷. This will be achieved through a coordinated industry led business and market focused strategy for improved horticultural sector economic performance that will lead to increased inclusive economic growth in Lang Son province. Establishment of a Horticultural Industry Sector Organization (known as HortLangSon) is the strategic Output 3 design feature to build sustainability through modifying incentives into marketing business opportunities. HortLangSon will provide the coordination and leadership role for the development of the Lang Son horticultural sector. It is intended that HortLangSon will be developed into a permanent industry organisation that will promote investment and value addition for horticultural sector members.

257. HortLangSon's sector role will feature: market driven product value chains aimed at added value "export" markets, encourage investment in sector industries, prioritise quality assurance, achieve strong business relationships between value chain actors, and where income for all actors, including women and men farmers, is increased.

258. HortLangSon will consist of:

- (i) Board of Directors that will consist of leading horticultural sector members and senior government appointees;
- (ii) Secretariat that will support the board and manage HortLangSon operations;
- (iii) Service delivery units that will deliver the core sector support and development functions.

259. The project will contract an Implementation and Contract Supervision Service Provider to provide the Secretariat services and develop service delivery units.

260. Once established and operational HortLangSon will initiate the development of its core functions and assist the development of product value chains. The first two value chains to be assisted by the project are planned to be star anise and safe vegetables.

261. Core HortLangSon functions will include:

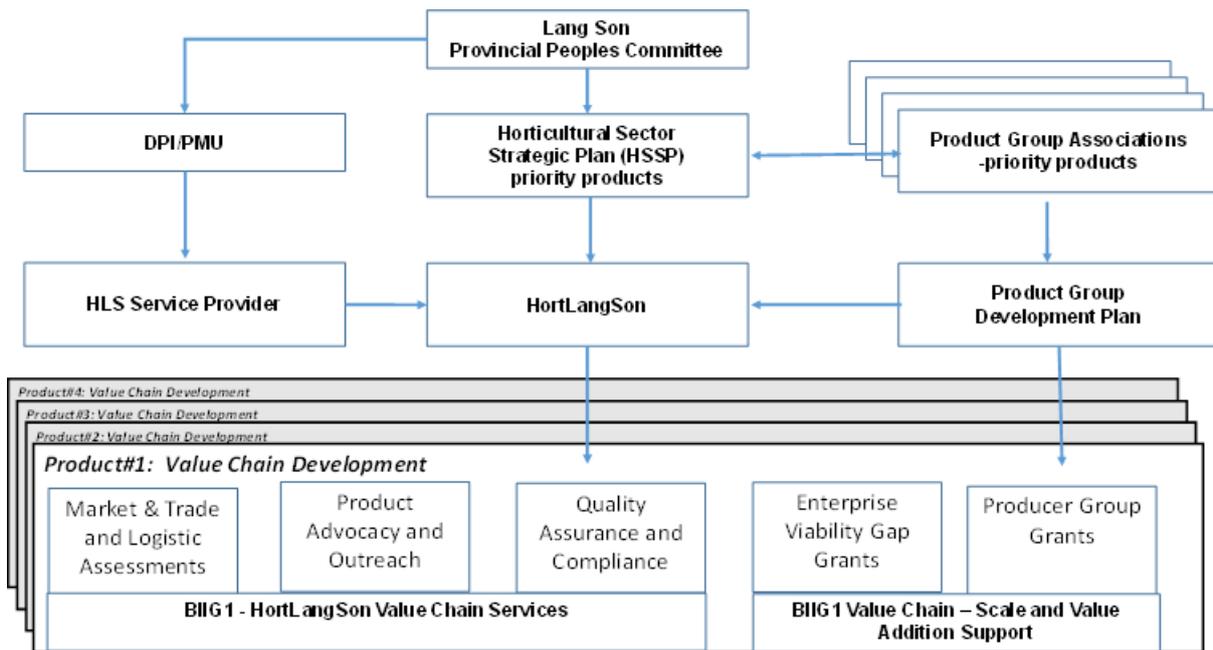
- (i) horticultural sector coordination by providing Product Groups with a platform to build their small sector industries;
- (ii) achieve cost effectiveness from shared common services that support value chain development;
- (iii) market knowledge and information;
- (iv) product quality assurance to meet international and trade standards;
- (v) export-trade linkages development, and;
- (vi) outreach and education.

262. HortLangSon will adopt a value chain development will enhance inclusive growth along the chain and provide increased economic opportunities for ethnic minorities and women empowering their participation in the sector and the wider economy.

263. The Output 3 Design Matrix is shown in Appendix 1 and this provides more detail on the Output 3 components and activities. Figure 8 below provides an outline of the establishment of HortLangSon.

²⁷ The four provinces are Cao Bang, Bac Kan, Ha Giang and Lang Son

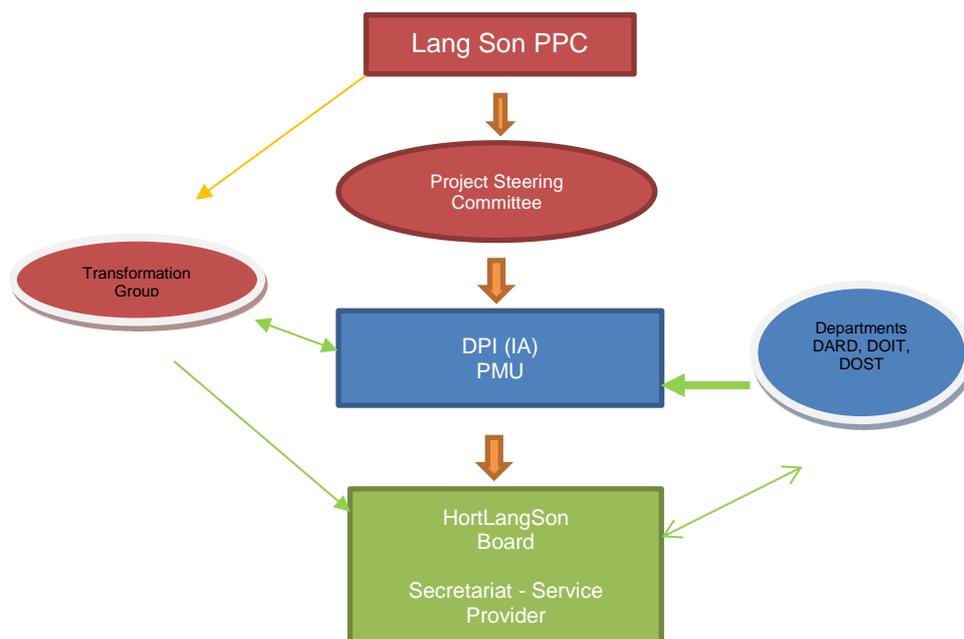
Figure 10: HortLangSon Product Value Chain Sector Services and Investment Grants



C. Management Structure and Main Roles

267. The Lang Son PPC is the Executing Agency (EA) and DPI is the Project Owner and Implementing Agency (IA). The PMU will be based in DPI. Figure 11 summaries the management structure for Output 3.

Figure 11: Management Structure for Output 3



Note:

Direct Responsibility



Liaison and Coordination



DPC –District Peoples Committee; CPC -Commune Peoples’ Committee

D. Summary of Main Output 3 Implementation Management Responsibilities

268. Output 3 project management responsibilities for the key agencies are summarized below. More detail of the responsibilities of key agencies are provided in subsequent sections:

| | |
|---|--|
| PPC-Executing Agency | <ul style="list-style-type: none"> • Project oversight including Output 3 • Strategic contributions to support development of HortLangSon and alignment with provincial development plans • Approve HortLangSon constitution • Approve HortLangSon Annual Budget and Work Plan • Receive and approve Annual HortLangSon Board reports • Approve Competitive viability gap grants for enterprise grants in excess of \$50,000 • Receive and approve BIIG quarterly reports, including Output 3 Report • Nominate three (3) provincial government representatives to the interim HortLangSon board for the first three (3) years • Appoint five (5) private sector members to the interim HortLangSon board for the first three (3) years |
| <p>There will be a PPC Vice-chairperson appointed to be responsible for the BIIG 1 Project in Lang Son, including Output 3. The appointed PPC Vice-chairperson will work closely with the PMU Director.</p> <p>For key project activities, the Vice Chairperson will be the approving authority.</p> | |

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| Sector Transformation Group | <ul style="list-style-type: none"> • Provide a strategic overview and guidance to HortLangSon board for the sectors transformation that reflects the PPC’s priorities • Ensure that sector strategic plan is aligned with the SEDP |
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| | <p>sector development strategy</p> <ul style="list-style-type: none"> • PPC assisted to facilitate the establishment of the interim HortLangSon board and organization • Policies to encourage sector investment are identified and promoted and investment is encouraged in the sector from provincial businesses and outside and overseas investors • Implementation of departmental and HortLangSon plans for the sector are aligned and demonstrate efficient use of resources to achieve sector objectives and targets set by PPC • Development of departmental sector services are enhanced to meet sector needs and, where feasible, are coordinated with HortLangSon services to ensure higher quality and cost effective service for the sector |
| <p>The Sector Transformation group will be high level body that consists of: PPC Vice Chairperson, PMU Director, and departmental leaders responsible for horticultural sector planning from: DOIT, DPI, DOF, DARD, DOST and the HortLangSon Chief Executive, and two representatives of the Provincial Business Association. It is responsible to the PPC for strategic overview and guidance, and includes encouraging horticultural sector investment and developing policies to encourage sector investment. Ensuring that the horticultural sector strategic plan is aligned with the provincial SEDP strategy is also a main role. The Sector Transformation group will advise on alignment between the HortLangSon annual plan and the horticultural sector priorities in the departmental plans to ensure consistency with provincial objectives and efficient use of provincial resources.</p> | |
| <p>Project Committee Steering</p> | <ul style="list-style-type: none"> • Ensure there are synergies and cooperation in the use of Output 3 resources with provincial resources • Identify any coordination issues between departments, district and Output 3 Implementation by the HortLangSon Service Provider • Receive Annual HortLangSon Board reports • Receive BIIG quarterly reports, including Output 3 Report |
| <p>The PSC will include Directors from provincial Departments: DPI, Department of Transport, DOIT DOST, Department of Natural Resources and Environment (DONRE), Department of Border Gate and Special Economic Zone Management Office, Department of Labor, Invalids, and Social Affairs (DOLISA), Women's Union, Provincial Committee for Ethnic Minorities (PCEM) and Department of Agriculture and Rural Development (DARD).</p> <p>The PSC will meet twice a year, or at the request of the PPC.</p> | |
| <p>DPI (Project Owner) and PMU</p> | <ul style="list-style-type: none"> • Procurement including procurement of the HortLangSon Service Provider (Advance Action) • Work with the service provider to develop a HortLangSon establishment plan with clearly identified actions, roles and timelines, • Facilitate the appointment of HortLangSon board • Support linkages between PPC and HortLangSon • Manage all Output 3 fiducial aspects • Process all payments to grantee bank accounts • Provide HortLangSon operational expenses through direct payment until an operational subaccount is created • Receive Viability Gap Grants for Enterprises evaluations from HortLangSon, review, and pass to PPC for approval • Receive and review HortLangSon annual plan and budget, and pass on to PSC for approval • Receive and review Quarterly and Annual HortLangSon reports, and pass on to PSC • Social and environmental safeguards compliance monitoring |

Key Output 3 tasks that the PMU will manage will be the procurement of the Service Provider, support for the establishment of HortLangSon, and oversight of the Competitive Grants.

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| HortLangSon | <ul style="list-style-type: none"> • Establish the Interim Board to provide governance and strategic direction to sector • Represent horticultural sector members over industry issues and sector development: national and provincial levels • Contribute to sector policy development – advise PPC and departments • Provide leadership industry sub sector development through Product groups with modern value chain development • Coordinate with PPC and DPI to attract and encourage sector investment • Provide key services to sector members <ul style="list-style-type: none"> - Trade data and market information - Post harvest system development - Quality assurance information and development - Business, marketing and technical production services |
| <p>Note: HortLangSon will be established with the aim of it being developed into a fully functioning Horticultural Sector Industry Organisation for the Lang Son horticultural sector in the medium term. It is intended that over the life of the project that HortLangSon will develop its role as the representative body, and provider of core services, for all the horticultural members and that this role will continue to evolve and strengthen after the project is completed.</p> | |

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| Service Provider | <ul style="list-style-type: none"> • Fill the HortLangSon Secretariat role with the Team Leader as interim Chief Executive Officer for the first three years • Be responsible for development of all operational procedures and business rules for HortlangSon • Lead the implementation of Output 3 project activities • Annual plan preparation each project year detailing use of project funds, submit to PMU for PPC approval • Develop core services and implement these for the representative subproject value chains • Lead the development of product Product group strategic plans and link these with market and trade development programs • Manage Competitive grant application process <ul style="list-style-type: none"> - Advertise grants - Evaluate grants - Provide recommendations to PMU and PPC for approval • Coordination and liaison with departments and district agencies • Quarterly and Annual Progress Reports provided to PMU • Monthly financial reports provided to PMU |
| <p>The Service Provider will be based in HortLangSon has two main roles in the project: (i) assist the development of HortLangSon as a Horticultural Sector Industry Organisation representing sector members and providing cost effective core services to the sector, and; (ii) manage the Output 3 investment program and the delivery of the business development, marketing and production service activities.</p> | |

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| Department: DARD | <ul style="list-style-type: none"> • DARD will be responsible for state functions in the horticulture sector and will support Output 3 activities as part of the normal DARD annual work plans and programs • Key DARD functions will be: <ul style="list-style-type: none"> - Production support for star anise, safe vegetables and |
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| | <p>other crops</p> <ul style="list-style-type: none"> - Advice and assistance with disease responses, and plant protection - Extension and training services - Food safety advice and certification services - Applied research and demonstrations - Product group formation and operations |
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Although DARD will be responsible for state functions in the horticulture sector it will not have a direct role in project implementation management. DARD's project role will be in the provision of their state management functions to the sector members (see Section III C).

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| Department: DOIT | <ul style="list-style-type: none"> • DOIT will be responsible for state functions in the horticulture sector and will support Output 3 activities as part of the normal DOIT annual work plans and programs • Key DOIT functions will include: <ul style="list-style-type: none"> - Trade promotion and market development - Access Provincial Industrial Development funds - Sector data collection - Safe vegetable market connections - Safe vegetable and star anise inspections - Promotion of processing development |
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Although DOIT will be responsible for state functions in the horticulture sector will not have a direct role in project implementation management. DOIT's project role will be in the provision of their state management functions to the sector members (see Section III C).

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| Departments: DOST | <ul style="list-style-type: none"> • DOST will be responsible for state functions in the horticulture sector and will support Output 3 activities as part of their normal annual work plans and programs • Key DOST functions will include: <ul style="list-style-type: none"> - Use of Geographical Indicator (GI) for star anise and any product GIs - Trade name development - Research including international coordination - Quality standards development |
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DOST will be responsible for state functions in the horticulture sector will not have a direct role in project implementation management. DOST's project role will be in the provision of their state management functions to the sector members (see Section III C).

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| Districts | <ul style="list-style-type: none"> • DPCs will be responsible for the coordination of Output 3 activities at the district level through a District Coordination Committee. One DPC Vice Chairperson will be appointed to manage the coordination. • District divisions and service units will provide technical support for project activities in their respective districts. • No direct role in procurement or disbursement |
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No district level PMUs will be formed for project implementation management.

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| Communes | <ul style="list-style-type: none"> • Commune Peoples' Committees will form a Commune Coordination Group responsible for the coordination of Output 3 activities in their commune. One CPC Vice Chairperson will be appointed to manage the coordination. • Commune Peoples' Committees will be required to provide formal registration for Producer Groups involved in Output 3. • Commune Peoples' Committees will assist Producer Groups with group financial management and reporting. • Commune Peoples' Committees will be responsible for managing the Quarterly Progress reports on Output 3 |
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| | <p>activities in their communes.</p> <ul style="list-style-type: none"> • Commune Extension Workers will provide technical support for farmers involved in Output 3 activities in association with district extension services and HortLangSon. • No direct role in procurement or disbursement. |
| <p>No specific project units will be formed for commune level implementation. Commune Peoples' Committees will provide services to support Output 3 implementation in their commune.</p> | |

III. Output 3 Implementation Management

269. Section III is aimed at the PMU and HortLangSon Service Provider staff, and the departments, districts and communes involved in the project.

A. Content of Section

270. It outlines the:

- (i) PMU implementation management roles
- (ii) HortLangSon role and functions
- (iii) HortLangSon Service Provider implementation responsibilities
- (iv) Role of the Departments, districts and communes.

B. Project Management Unit

271. The PMU implementation management roles and responsibilities that apply to Output 3 are presented in Table 54 below.

Table 54: PMU Implementation Management Responsibilities for Output 3

| PMU Management Responsibilities | HortLangSon Service Provider Responsibilities |
|---|---|
| Advance Action | |
| Contracting of the Service Provider for Output 3 | <i>Advance Action managed by the PMU</i> |
| Management | |
| Day to day operation and management of the project | All Output 3 day to day tasks will be devolved to HortLangSon |
| Submit regular (quarterly and annual) project reports to BIIG coordination unit and ADB | HortLangSon will be responsible for Output 3 reporting providing Quarterly and Annual reports to PMU |
| Reviewing annual work plans and budgets for Output 3 | HortLangSon to prepare Annual Workplan and Budget (for the upcoming year) by 30 October and submit to PMU |
| Coordinate and liaise with line agencies and other agencies as appropriate on common policy, regulatory context, implementation procedures and financial issues | HortLangSon Coordination with line agencies will be achieved through Output 3 Transformation Group and the Output 3 Coordination Committee |
| Fiduciary | |
| Set up and maintain project financial system and be responsible for project payments through the approved bank accounts | HortLangSon will: (i) establish an Output 3 Sub account (of the PMU Project account), and; (ii) create their own HortLangSon for the separate HortLangSon operations. |
| Approving all contracts, grants for | HortlangSon will manage the grant process |

| PMU Management Responsibilities | HortLangSon Service Provider Responsibilities |
|---|---|
| implementation of Output 3 | and submit to PMU and PPC for approval |
| Safeguards | |
| Update social and environment safeguard documents and submit to ADB for clearance prior to implementation | HortLangSon will not be directly responsible for this but will assist the PMU social and environmental safeguards staff to ensure that the provision of EARF/RENDF are applied and reflect best practice |
| Implement GAP, Poverty Reduction and Social Strategy, Stakeholder Participation Plan and report results to ADB regularly as required by ADB | HortLangSon will have the responsibility to ensure that the Gender Action Plan (GAP), Poverty Reduction and Social Strategy, Stakeholder Participation Plan for Output 3 are addressed in all plans and implemented activities. The PMU gender and social safeguards staff will advise and assist as required |
| Ensure environmental protection and mitigation measures (in the EMPs) are incorporated in detailed designs and contract awards | HortLangSon to ensure compliance during implementation: PMU Environmental Safeguards staff to monitor |
| Ensure implementation of the Environmental Management Plans (EMPs) and submit regular monitoring reports through the IAs to the EAs and ADB | HortLangSon to ensure compliance during implementation: but PMU Environmental Safeguards staff to monitor and report |

C. Management and Coordination Mechanism

272. The day to day management of Output 3 will be agreed between the PMU and PPC and the Service Provider. This will be based upon a management options paper prepared by the Service Provider within three months of commencement. The PMU will not be responsible directly for implementing any of the Output 3 Activities (apart from procurement of the Service Provider).

273. The PMU role will be one of oversight, provides the project systems and procedures, and ensure that the tasks defined in the Service Providers terms of reference are delivered. The PMU Director will finalise a management mechanism agreement with the Service Provider team leader that will include:

- (i) Service Provider provides an annual workplan to PMU by October 30 (for the upcoming January to December year);
- (ii) Service Provider prepares a monthly workplan to the PMU for the upcoming month – by five (5) days prior to the start of the upcoming month
- (iii) Project Director and Deputy Director/Interim HortLandSon Board Chairperson meet the Service Provider Team Leader each month to review progress and the proposed plan;
- (iv) PMU team and Service Provider team meet at least quarterly;
- (v) Service Provider has regular meeting with the provincial departments;
- (vi) The Service Provider will be the designated secretary at all meetings and will prepare minutes within 3 days of the meeting that summarise the main matters discussed and outline the agreed actions. The Service Provider Team Leader and the Project Director will co-sign the minute that will be posted on-line.
- (vii) Streamlined system for the Service Provider team members to have prior approval to work in district and communes based on the annual workplan, and a two (2) week prior notification of field presence.

274. Once the management mechanism has been agreed between the PMU and the Service Provider it will be formalized in a Memorandum of Understanding.

275. The PMU Director will define the responsibilities of the PMU staff with respect to Output 3. As noted above the PMU staff will not have a direct Output 3 implementation role, but they will work closely with the Service Provider team. Table 55 summarizes the key roles and these will be further defined once the Service Provider is appointed and operational procedures finalized.

Table 55: PMU staff – Output 3 Responsibilities

| PMU Position | Main Responsibilities for Output 3 |
|-------------------------|--|
| Director | Interim Chair of HortLangSon board Member of Sector Transformation Group Output 3 implementation performance oversight Financial management and disbursement Monthly meetings with Service Provider Team Leader Approval of Competitive grants below \$50,000 Approve HortLangSon Service Provider work plans and associated funding requirements Review HortLangSon and Service Provider Quarterly Reports and forward to PPC |
| Deputy Director | Monthly meetings with Service Provider Team Leader Operational liaison and coordination including departments and districts Attend meetings with departments and districts over coordination of Output 3 activities Approve Service Provider monthly workplans and field visits Periodic field monitoring visits to Output 3 activities (at least monthly) |
| Agricultural Specialist | Advise Director on Output 3 activities Regular field monitoring of Output 3 activities Coordination between Service Provider and Departments-through Output 3 Coordination Group Assist Service Provider to establish contacts with horticultural sector enterprises Assist Service Provider with gathering of sector data from departments and districts Assist Service Provider with horticultural sector awareness and communications program Assist with PPMS development for Output 3 |
| M&E Specialist | Ensure that the Output 3 GAP measures are included in the PPMS Work with Service Provider to develop system to gather Output 3 data for PPMS Provide PPMS data to Service provider for Output 3 Quarterly and Annual reports Present M&E reports and proposed adaptations to workplans to PMU/PPC on a quarterly basis |
| Chief Accountant | Receive monthly financial reports from HortLangSon Service Provider |

| PMU Position | Main Responsibilities for Output 3 |
|--------------------------|---|
| | <p>Organise transfer of HortLangSon Service Provider operational funds based on monthly financial plan</p> <p>Supervise the Service provider and HLS interim board in the formation of a financial management system and project subaccount</p> <p>Ensure HortLangSon Service Provider complies with financial regulations</p> |
| Environmental Safeguards | <p>Ensure that the environmental protection and mitigation measures are included in the design of the Output 3 activities (based upon the EMP)</p> <p>Monitor Output 3 compliance with project's environment regulations and EMP through regular field visits</p> <p>Provide semi-annual and annual monitoring report on environmental safeguards compliance</p> |
| Gender Specialist | <p>Assist the M&E specialist to include the Output GAP measures in the PPMS</p> <p>Advise and assist the Service Provider to implement the Output 3 GAP actions</p> <p>Advice and assist with Product Group and Producer Group formation and operations</p> <p>Monitor implementation progress to ensure compliance with Output 3 GAP and other gender policies</p> |
| Social Safeguards | <ul style="list-style-type: none"> • Ensure that the social safeguards regulations are complied with in the design of the Output 3 activities • Monitor Output 3 compliance with project's social safeguards regulations through regular field visits • Provide semi-annual and annual monitoring report on social safeguards compliance |

276. The PMU Deputy Director will be the main operational contact for the Service Provider and the PMU Agricultural Specialist will facilitate the agreed operational linkages with the horticultural sector and Lang Son departments. The high proportion of the women involved the horticultural sectors means that the Gender Specialist will have an important role that will include both implementation support (working with HortLangSon), as well as monitoring to ensure compliance.

D. HortLangSon Role and Functions

277. Background: The rationale for forming HortLangSon is further described here as it provides a background for all Output 3 implementers about the HortLangSon role and functions.

278. HortLangSon's role consists of the following strategic activities:

- (i) prepare a strategy for the sector's growth and development;
- (ii) engage with private sector organization's and members and government departments to plan and implement the sector strategy;
- (iii) initiate and implement a program of sector enhancement activities that includes assisting value chain development;
- (iv) identify and provide a platform for horticultural Product groups to access cost effective services;
- (v) prioritize product quality assurance and standards for export, food safety, trade

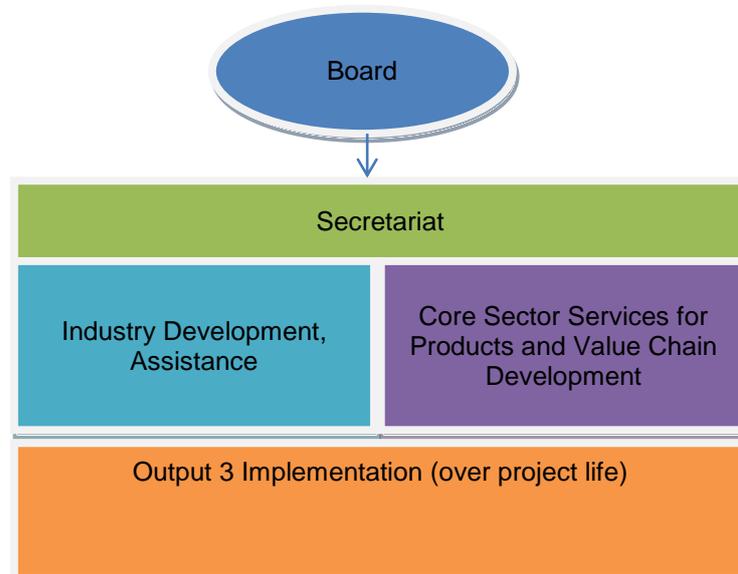
- relationships and sector member education;
- (vi) manage and deliver a program of business, marketing and production advice and support;
 - (vii) ensure that sector development interventions actively and equitably target, and are inclusive of, ethnic minorities and women; and,
 - (viii) act as a Secretariat to represent Product groups that include sector agri-enterprises, farmers and other members.

The Vision for the Horticultural Industry Sector Organization is to achieve the following outcomes:

- Coordinated and coherent strategy for the sector's development;
- Market, trade and other services provided to sector members;
- Facilitate investors and investors into the Lang Son Horticultural Sector;
- Identify and proactively market investment opportunities;
- Sector product groups involved in sector planning and development;
- GoV agencies with a coordinated service focused approach to sector support;
- Competitive market led value chains for selected products developed;
- Inclusive growth for the sector and its members, including women and men farmers.

279. HortLangSon's structure will consist of a governance board and secretariat that will support the board and manage the core roles and functions as summarized in Figure 5 below:

Figure 12: HortLangSon Structure



280. Establishment of HortLangSon will be managed by the PMU and implemented by the Service Provider. Once appointed the Service Provider will provide advice and support to the PMU and PPC over HortLangSon development (see Section IV Output 3 Implementation). Over the life of the Project the aim is for HortLangSon to:

- (i) become a fully functional and viable horticultural industry sector organization;
- (ii) be established as an association with the horticultural sector Product groups as the members;
- (iii) lead a market focused approach to sector development with strong Product groups and modern value chains;
- (iv) develop its core business, marketing, export and trade and quality assurance services that will be available to sector members

281. In the early stages of HortLangSon the province will be responsible for the operational costs - through the project. It is envisaged that as the Product groups develop and have increased financial resources from the higher prices for their products that they will start to contribute to the operations costs through Product group levies, and payment for some of the HortLangSon services.

282. The Service Provider will assist with the legal establishment of HortLangSon including the constitution and articles of association in compliance with the national law. Establishment tasks also involve preparing the governance arrangements, functional responsibilities, operational guidelines, and scope of work. The Service Provider will also lead the preparation of the first HortLangSon business plan.

283. **HortLangSon Governance:** for the first three years, will be through an Interim Board consisting of eight members:

- (i) Five horticulture private sector members will be appointed by the PPC to the Interim board;

- (ii) At least two (2) of the private sector members must be women;
- (iii) Three Government of Viet Nam (GoV) representatives, one from each of the following departments: DOIT, DARD and DOST;
- (iv) At least one (1) of the GoV agencies members must be a woman;

284. The PMU Director will be the Interim Board Chairperson, and will report to the PPC. The Interim Board will as part of defining HortLangSon establishment will also define board succession for incorporation into the HortLangSon articles of association within the first two years. After three years of HortLangSon's operation the Interim Board will transition to an Elected Board of Directors through a succession plan based on the agreed operational policies at the Annual General Meeting. The province will continue to have three members appointed by the PPC, one of whom will be the PMU Director.

285. To ensure governance continuity in the newly formed organization the articles will include the requirement that there will be a rotation of the private sector members of the board. Three of the appointed private sector members will retire, but will be eligible for election at the Annual General Meeting. Two of the interim board members will continue as members for first five - year term. The Interim Board will vote to determine the two members that will continue for three more years. From the second five - year term election onwards all private sector board members will complete their terms, but may be eligible for re-election depending upon their length of tenure (see below).

286. By default, the tenure of the board members will be limited to two five - year terms unless the Board itself deems otherwise and the subsequent Annual General Meeting votes their support of the proposal for an extended term of the board members. At the stage that the product groups assume full financial responsibility for HortLangSon the PPC will be represented by one voting board member, and three non-voting members.

287. HortLangSon's functions and tasks will be implemented through a Secretariat that will be responsible for the organization's operations. For the first three years of the Project the Secretariat role will be undertaken by the contracted Implementation Supervision and Contract Management Service Provider. The Service Provider will be responsible for:

- (i) Development of the HortLangSon Secretariat role and establish the institutional basis for its effective operations;
- (ii) Specify and operationalise core services including marketing, trade and logistic services, quality assurance and sector advocacy;
- (iii) Implement the project investment activities to facilitate horticultural sector development e.g. Competitive grants;
- (iv) Assist Product value chain development commencing with the star anise and vegetable value chains;
- (v) Establish the range of services that HortLangSon will provide to the sector: of technical, production, business, quality assurance, trade and information, and marketing services for sector Product value chain development;
- (vi) Support developing a transition plan for the transfer of some current government services to HortLangSon on a user pays basis (based upon prior approval of the PPC).
- (vii) Review the options for building a quality assessment labelling and traceability program for Lang Son products

288. HortLangSon's strategic role in the horticultural sector development will involve a close working relationship with the PPC. Increasing horticultural sector investment is a priority for the PPC and HortLangSon will ensure that there is close alignment between the sector strategy and the province's development strategy and plans. Once HortLangSon is operational it will work in combination with the PPC and DPI to promote horticultural sector investment from both

within and outside the province.

289. **Implementation Management** - Once appointed the Service Provider will be responsible for the implementation of Output 3. This will consist of two main task areas:

- (i) HortLangSon establishment, develop its sector industry role, and get the core functions operational;
- (ii) Implement the Output 3 investment and business development, marketing and production technical support program.

290. The Service Provider will be responsible to the PPC through the PMU for implementing the Output 3 activities. These Output 3 activities are outlined in the Output 3 Design Matrix (Appendix 1 of this Manual) and Service Provider terms of reference (Appendix 3) describe in detail the tasks for each of the Service Provider experts. Main Service Provider implementation management tasks are presented in Table 56 below and there is a more detailed description of Service Provider activity implementation tasks in Section IV Output 3 Implementation.

Table 56: Service Provider Output 3 Management Responsibilities

| HortLangSon Service Provider Responsibilities | Guidance |
|--|---|
| Management | |
| Prepare annual workplan and budget | The annual workplan and budget will be submitted to HortLangSon board for approval and then to the PMU. The first annual workplan and budget will included in the Inception Report. |
| Prepare monthly workplan and submit to PMU | This is part of the management mechanism and will ensure coordination of Output 3 Activities with PMU tasks and responsibilities e.g. safeguards |
| Management of the day to day operations of the Service Provider team | Team Leader responsible |
| Coordinate and liaise with departments | At two levels: Sector Transition Group for sector strategy and planning; and Output Coordination Committee for operational cooperation |
| Submit quarterly and annual project reports to HortLangSon board and PMU | Reporting formats by based upon the PAM (see PAM) will be agreed with PMU |
| HortLangSon Institutional Development | |
| Mentor HortLangSon board in their sector governance role | Service Provider Team Leader will be the Interim Chief Executive Officer and lead the mentoring of the board |
| Business planning and annual work plans and budget | Service Provider to lead preparation of first Business Plan, and annual work plans and budgets. Board will endorse these before going to PMU and PPC for approval |
| Operational planning, and reporting | Develop systems for monthly plans based upon annual plan, and output based reporting |
| HortLangSon develops its role as a sector organisation | Focus is upon representing Product group members assisting with industry issues – this role will evolve through Service Provider support |

| HortLangSon Service Provider Responsibilities | Guidance |
|---|---|
| HortLangSon core functions developed and services provided to sector members | Service Provider will develop these through Activities 3.1.7, 3.1.8. and 3.1.9 |
| Investment Program Management | |
| Prepare the procedures and guidelines for the Competitive grant program | Service Provider implement Activity 3.1.6 |
| Contestable grant program | Service Provider implement Activity 3.1.6 |
| Implement supporting activities: Product Groups and Outreach | These are Activities 3.1.5, and 3.1.9 |
| Promote sector investment in cooperation with DPI Investment division | This will be linked with PPC strategy to attract investment to Lang Son |
| Fiduciary | |
| Set up and maintain financial system for HortLangSon | The financial system will be designed to meet the role of HortLangSon as an industry organisation. Project will support all HortLangSon activities and this includes the Service Provider |
| Manage project payments through the approved bank account | There will be two bank accounts: (i) sub account from the project that will provide the funds for Service Provider and the project supported operations of HortLangSon, and (ii) HortLangSon account for their operations (this will be become more important as the project evolves) |
| Ensure that the Producer Groups comply with ADB shopping procedures for procurement of grant items | The Financing and Grant Management expert will be responsible for overseeing that the ADB procedures for shopping are applied (see Section VI Producer Group in this Manual). The Producer Group leadership will be assisted to be responsible for the procurement with support by the Service Provider |
| Develop the role of HortLangSon board in financial governance and management relationship to PPC and ADB | The Service Provider will mentor the HortLangSon board and assist them to assume a full financial governance role |
| Provide monthly financial reports to PMU and HortLangSon board | PMU must be provided with timely monthly financial statements, these will be the trigger for the release of funding tranches. HortLangSon board will receive and review accounts quarterly at board meetings |
| Prepare HortLangSon annual financial accounts and submit to PMU for audit | HortLangSon will be audited as part of the external audit by the ADB. It will also audited by a certified international audit firm. |
| Safeguards and Gender | |
| Ensure that the final design and implementation of all Output 3 activities complies with the project's environmental safeguards regulations | The Team Leader will ensure compliance and the Service Provider team will work closely with the PMU Environmental Safeguards staff member |
| Ensure that the final design and implementation of all Output 3 activities complies with the project's social safeguards regulations | The Team Leader will ensure compliance and the Service Provider team will work closely with the PMU Social Safeguards staff member |
| Ensure that the planning, design and implementation of the Output 3 activities | Close liaison will be required with the PMU Gender specialist. See Section VII Gender |

| HortLangSon Service Provider Responsibilities | Guidance |
|--|----------------------|
| incorporates the GAP actions and targets | for more information |

291. The Service Provider team will consist of a team of experts who will deliver the technical assistance for horticultural sector development. The main tasks that each of the Service Provider team members are responsible for are shown in Table 57 below. See Appendix 3 for the full service provider scope of services and terms of reference.

Table 57. Service Provider Team Responsibilities

| Team Position | Main Tasks |
|---|---|
| Team Leader Agricultural Marketing and Value Chain expert | <ul style="list-style-type: none"> • Direct and manage the TA team • Liaison with PPC and PMU • Lead HortLangSon institutional development • Lead engagement with horticultural sector • Lead the preparation of the HSSP and HortLangSon business plan • Lead the preparation of the Product Group development plans • Coordination with departments • Technical marketing and value chain inputs |
| Post- Harvest Systems and Value Chain expert | <ul style="list-style-type: none"> • Assist with the preparation of the HSSP • Assist with the preparation of the Product Group development plans • Guide and assist producers and agri-enterprise to improve post-harvest management • Coordinate with DOST and DOIT in quality post harvest systems development • First focus is upon star anise and safe vegetable value chains • Develop HortLangSon post-harvest advice and support function |
| Quality Assurance and Compliance Systems expert | <ul style="list-style-type: none"> • Guide and assist producers and agri-enterprise to improve quality assurance and compliance systems • Assist with the preparation of the HSSP • Assist with the preparation of the Product Group development plans • Coordinate with DARD, DOST and DOIT in quality assurance and compliance systems development • First focus is upon star anise and safe vegetable value chains • Develop HortLangSon quality assurance and compliance support function |
| Markets and Trade Logistics expert | <ul style="list-style-type: none"> • Guide and assist producers and agri-enterprise to access and use market and trade data • Assist with the preparation of the HSSP and associated market plan preparation • Assist with the preparation of the Product |

| Team Position | Main Tasks |
|--|--|
| | <ul style="list-style-type: none"> • Group development plans • Coordinate with DOIT in market and trade systems development • First focus is upon star anise and safe vegetable value chains • Develop HortLangSon market and trade information function |
| Financing and Grant Management expert | <ul style="list-style-type: none"> • Develop and implement the Competitive grant mechanism • Advise and assist agri-enterprises with their grant applications and business plans • Assist Producer Groups with procurement • Manage grant evaluation • Monitor performance of agri-enterprises with grants |
| Agricultural Producer Groups and Market Linkage expert | <ul style="list-style-type: none"> • Initiate formation of Product Groups and assist their development • Assist with the preparation of the Product Group development plans • • Monitor Product Group operations and provide regular support • Advise and assist with the formation of Producer Groups • Assist Producer Groups with the development of their group operations |
| Information Systems and Outreach expert | <ul style="list-style-type: none"> • Plan and lead the outreach program – awareness and communications • Manage the training and learning activities • Develop the sector information system |
| Field Technical Extension staff | <ul style="list-style-type: none"> • Provide production, business and marketing advice support to the Producer Groups • Coordinate with government technical services |
| Accountant | <ul style="list-style-type: none"> • Manage the HortLangSon and Service Provider finances • Provide financial reports to PMU |
| Office Support | <ul style="list-style-type: none"> • Office services functions |

E. Role of Lang Son Provincial Departments, Districts and Communes

292. Provincial departments will not have a direct implementation role. They will, however, have an important role in performing their state management function to support horticultural sector development. Output 3 design recognizes their role the development of the horticultural sector. The provincial departments are also represented upon the Lang Son BIIG 1 Project Steering Committee. Government regulations do not permit the Lang Son departments to be funded by the project. This includes any extension, training and research activities that are linked to the Output 3 activities. All the of the various department's services and activities must be funded through their annual budget.

293. Departments should ensure that they include any proposed Output 3 support services in their annual plan and budget, and the PMU will be responsible for nearing that this occurs.

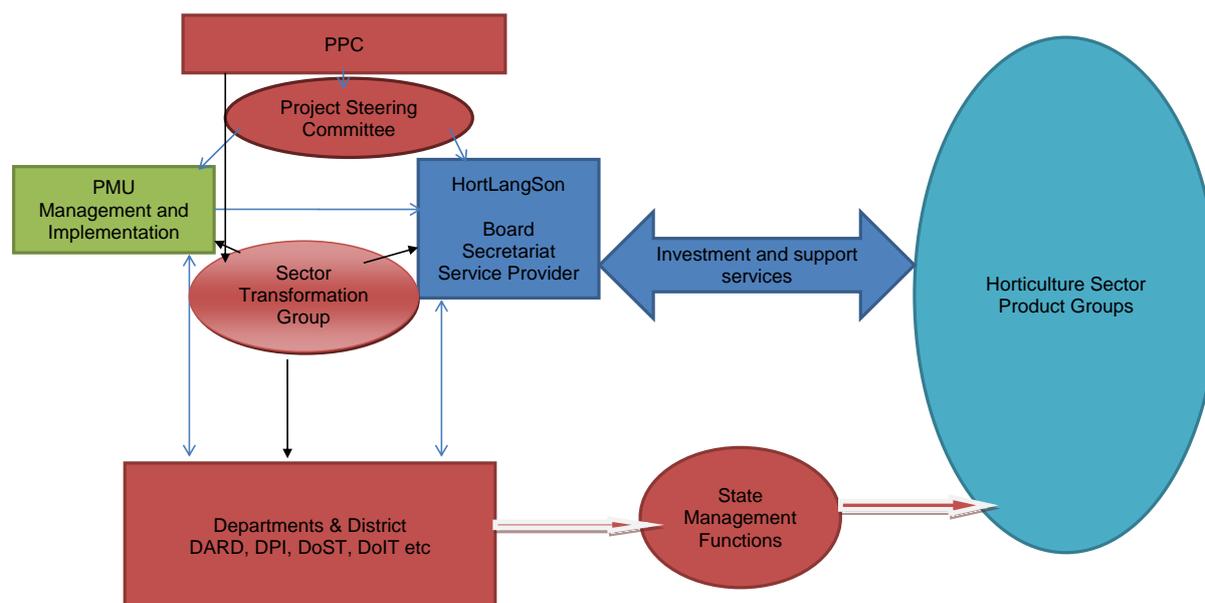
294. The development of HortLangSon as Lang Son's horticultural sector industry organization requires that a close working relationship is established between HortLangSon and the key departments involved in the horticultural sector. A Horticultural Sector Transformation Group will be formed to achieve a high degree of synergy for sector development between the departments and HortLangSon. The purpose of the Sector Transformation Group is the strategic integration of the functions and activities of the departments and HortLangSon to achieve a coordinated approach to sector development. Sector Transformation Group membership will consist of the leaders of the departments, the Lang Son Business Association, the HortLangSon Chief Executive Officer and the PMU Director will chair the group. The Sector Transformation Group will meet twice yearly (October and March). The October meeting will focus on coordination and integrated planning for the upcoming year, while the March meeting will be to ensure integration of activities. Terms of reference for the Sector Transformation Group are shown in Appendix 4.

295. An overview of coordination between the departments, districts, project units and HortLangSon is shown in Figure 13.

296. Although the Departments will have a limited direct implementation responsibility their contribution to Output 3 through their statement management functions is important. Over the life of Output 3 the departments will develop a close working relationship with HortLangSon that will establish the basis for their sector roles after the project is completed. The following short sections outline the current involvement of the main departments in the horticultural sector and present the main areas where it is expected that the departments will contribute to the Output 3 and coordinate with HortLangSon for sector development.

297. The mechanism for planning and coordination role will be:

- Sector Transformation Group – strategy coordination, planning and implementation overview;
- The role of the districts and communes in Output 3 support is also described in this section.

Figure 13: Relationship between HortLangSon and Departmental and District Agencies

F. Department of Agriculture and Rural Development

298. DARD will be a member of the PSC and also the Sector Transformation Group. DARD has a major horticultural sector role through overseeing the implementation of the Lang Son agricultural and rural development SEDP plan 2011-2020 where star anise and safe vegetable are two priority industries in Lang Son.

299. DARD's has recent and ongoing programs in the horticultural sector that include:

- (i) Plant Protection sub division cooperated with DOST to study to improve the productivity of star anise and the impact of pestilent insect upon star anise;
- (ii) Provincial Extension Service is carrying out a sustainable star anise research and demonstration model on 10 ha of farmers land in Van Quan district.

300. Based on DARD's mandate and technical expertise the main areas where DARD can complement the Output 3 activities for horticulture sector development:

- (i) Continue the program of supporting sustainable growth of star anise and safe vegetable, including replanting and restoring the old and stunted star anise tree;
- (ii) Provide technical support and advice to the PMU and HortLangSon;
- (iii) Monitor and evaluate the implementation of process of sustainable growth star anise and safe vegetable by season and yearly;
- (iv) Provide a seasonal forecast on epidemic disease on star anise and vegetable;
- (v) Develop the material for training on sustainable star anise and safe vegetable (growth, caring, and harvesting), as well as proving training course to working groups/cooperatives;
- (vi) Coordinate with DOST to transfer the advance technique on sustainable growth of star anise and vegetable (updating the cultivating process, VietGAP, GlobalGAP);
- (vii) Inspection of the safe vegetable and star anise, as well as checking the implementation of crop production process.

G. Department of Industry and Trade

301. DOIT will be a member of the PSC and also the Sector Transformation Group. Through its state management of all activities related to industry and trade it has several important activities related to star anise and safe vegetable where there can be coordination with the Output 3 activities:

- (i) Development of trade promotion channel for star anise via connecting with oversea market such as India, Malaysia, France, and China;
- (ii) Support for enterprises working on star anise industry in Lang Son to bring their products to trade fair (DOIT will cover the kiosk rental fee). DOIT and Pingxiang Town – Nanning - Guangxi – China have very close relationship and they organize a reciprocal trade fair once a year.
- (iii) Cooperation with Lang Son provincial market management joint stock company and the Cooperative Union to develop a retail chain selling safe vegetable at three markets in Lang Son city;
- (iv) Market development- assisted safe vegetable cooperatives to meet with potential customers in Lang Son such as Muong Thanh hotel, Hoa Sim hotel, New Century restaurant, etc.; and assisted to find markets for Lang Son safe vegetable in Hanoi super markets;
- (v) Local enterprises assisted to borrow funds from the Lang Son Industry Development fund.

302. Based on DOIT's mandate, technical expertise and ongoing activities the main areas where DOIT can complement the Output 3 activities for horticulture sector development are:

- (i) Support horticulture agri-enterprises (including cooperatives) access the provincial Industry Development Fund for investment in processing facility, storage, or packaging;
- (ii) Cooperate with DOST to develop the trade name (brand) of star anise and safe vegetable (on-going);
- (iii) Sector data collection information on price and customer demand;
- (iv) Inspection of the safe vegetable and star anise, as well as checking the implementation of processing.

303. It is a condition of the project's competitive grants that the project's funds must not be used concurrently with any market development funding provided by DOIT, or any other provincial department. The approach that will be followed by HortLangSon is to coordinate with DOIT over horticultural sector marketing to ensure that there is no overlap of activities. This will be achieved through the Output 3 Coordination Group.

H. Department of Science and Technology

304. DOST will be a member of the PSC and also the Sector Transformation Group. It has state functions in several aspects that are important to horticultural sector development: science and technology development; standards, metrology, and quality; intellectual property; and provision of public services. Relevant DOST activities include:

- (i) Counterpart to SNV for the Spice of Life project implemented from August 2013 to May 2016;
- (ii) Geographical Indicator (GI) of star anise that was established by DOST in 2007 to protect the trade name and Lang Son star anise quality assurance. The GI has been managed by the Lang Son Star Anise Association and DOST permission is required for businesses to use the GI. DOST is responsible for annual inspection of star anise businesses using the GI to ensure compliance with the GI standards. DOST also takes samples of star anise fruits from various districts to ensure that the fruit chemical constituents meets the specifications

- in the GI registration;
- (iii) European trade policy and investment support project funded with European Union assistance that has been implemented since 2012 and will be completed in 2018. It aims to Lang Son to formally use the star anise GI in the EU countries;
- (iv) Cooperation with DARD and other research institutes (including the Guangxi Forest Institute) to study on improving the productivity of star anise and star anise inspect pests;
- (v) There is also a plan to propose the following star anise research topic and activities to the Ministry and Science and Technology:
 - (a) Establish the trade name for organic star anise;
 - (b) Study of the star anise drying process using an applied heat pump technique at the house hold scale;
 - (c) Study on star anise distillation process;
 - (d) Study on improving star anise production forests.

305. DOST's pre-eminent role in star anise research and development make it an important partner in horticultural sector development. Key areas for coordination and cooperation with HortLangSon are:

- (i) Research activities with national and overseas research institutes;
- (ii) Promote the use of trade name for marketing of star anise and safe vegetable (also with DOIT);
- (iii) Establishment of quality standards for the main sector products to meet the standard of EU, Japan, US etc., including the effective use of the star anise GI;

I. Department of Planning and Investment

306. DPI is the Implementing Agency (project owner) and its main contribution to the project is through the PMU. Divisions of DPI will also have a role and this includes:

- (i) Encouraging investment from outside of the province in agri-enterprise facilities and equipment for horticultural processing, and marketing;
- (ii) Promoting Investment in larger scale commercial intensive horticultural production facilities e.g. green houses for national and export markets.

J. Other Provincial Agencies

307. Several other provincial agencies will also have some role in Output 3. The agencies will include the Women's Union, Farmers Union, Provincial Committee for Ethnic Minorities (PCEM) and Cooperative Union. The Women's Union and PCEM will be members of the PSC.

308. The Women's Union role will include:

- (i) Safe vegetable groups formed by the Women's Union will be included in Stage 2 of the safe vegetable value chain development;
- (ii) District Women's Union will have one representative on the Output 3 District Coordination Committee;
- (iii) Commune Women's Union will one representative on the Commune Coordination Group;
- (iv) The District and Communes Women's Union network will be used to assist with Output 3 awareness and communications activities.

309. The Farmer's Union role will include:

- (i) District Farmer's Union will have one representative on the Output 3 District Coordination Committee;
- (ii) Commune Farmer's Union will one representative on the Commune Coordination Group;
- (iii) The District and Communes Farmer's Union network will be used to assist with Output 3 awareness and communications activities.

310. The Cooperative Union role will include:

- (i) Assist with the establishment of any new cooperative which must comply with the cooperative law;
- (ii) Support cooperatives or other groups on connecting with private sector and expanding market through its channel.

K. District

311. Background: Output 3 activities that will occur at the district level will be assistance for Producer Groups and assistance for district based horticultural sector agribusiness processors and marketers. Detail of this assistance is presented in Section IV Implementation.

312. District responsibilities: Implementation of district level investment activities will be by the Lang Son provincial PMU and supported by HortLangSon. The Project will not form a district level PMU as the districts will not be directly responsible for the implementation of any Output investment activities. The DPC will, however, be responsible for coordination of all the Output 3 district level project activities. Each district involved in Output 3 will nominate a DPC Vice Chairperson who will be the district focal point. The nominated Vice Chairperson will form an Output 3 District Coordination Committee. Each District Coordination Committee will be responsible for Output 3 activity oversight and management of the district functional responsibilities to support Output 3 activities. The composition of the Output 3 District Coordination Committee will be:

- (i) DPC Vice Chairperson;
- (ii) District Agricultural Division representative;
- (iii) District Extension Station representative;
- (iv) Division of Finance and Planning representative;
- (v) District Women's Union Representative, and;
- (vi) Commune leaders responsible for the Output 3 activities in their communes.

313. The Output 3 District Coordination Committee must meet at least quarterly. Responsibilities of the District Project Coordination Committee will be:

- (i) Coordinate the implementation of Output 3 activities in the district based upon communications with HortLangSon and the PMU²⁸;
- (ii) Maintain close communication with the communes and district based agri-enterprises that are involved in Output 3 activities;
- (iii) Promote the Output 3 Business Grants (Viability Gap Grants) to members of the district's horticultural agri-enterprises sector;
- (iv) Monitor the communes with the formation of the Producer Groups;
- (v) Coordinate the delivery of technical advisory services by district agencies to Producer Groups in association with Output 3 activities;
- (vi) Coordinate the delivery of technical advisory services by district agencies to

²⁸ The PMU and HortLangSon must inform the DPC prior to any Output 3 field visits and field based activities being undertaken. Any Output 3 correspondence to the communes, Farmer Producer groups and other horticultural sector business must also be sent to the DPC.

- (vii) agri-enterprises in association with Output 3 activities;
- (viii) Organize for the Division of Finance and Planning to provide oversight to the commune and the Producer Groups' procurement of the block grant investment items;
- (ix) Organize for the Division of Finance and Planning to provide oversight the Producer Groups with the financial management;
- (ix) Ensure that the costs associated with the district agencies support for the Output 3 activities are included in the district Annual Plan and Budget. Note: The Project will not provide funding to the district for Output 3 coordination and for technical service delivery. Therefore, the district must ensure that their annual budget submitted to the PPC includes an adequate allocation for their Output 3 coordination and technical service delivery tasks.

L. Commune

314. For the communes (where there are Output 3 Producer Groups) the Commune Peoples' Committee will be required form to an Output 3 Commune Coordination Group. This group will be led by Vice Chairperson from the Commune Peoples' Committee, members will be:

- (i) Vice Chairperson;
- (ii) Commune Accountant;
- (iii) Commune Extension Worker(s);
- (iv) Village leader(s) (for villages where the Producer Groups are based)
- (v) Vice Chairwomen of the Commune Women's Union, and;
- (vi) Commune Cadastral Officer.

315. The responsibilities of the Commune Coordination Group are:

- (i) Assist with the formation of the Producer Groups based upon the Producer Group guidelines (see Section V below). Group formation is required to strictly comply with the number of women members in the group (see Section VII Gender);
- (ii) Organize the formal registration of the Producer Groups involved in Output 3 (To HopTac) by the Commune Peoples' Committee. If any groups want to seek registration as a Cooperative this will be managed by the Commune Coordination Group in association with HortLangSon;
- (iii) Assist the Producer Group with the financial management. This includes opening a bank account for the Producer Groups, and financial reporting as required in the Producer Group regulations;
- (iv) Assist the Producer Groups with the procurement of the block grant investment items (see Section VI B Block Grants);
- (v) Assist the Producer Groups with technical support provided by the Commune Extension Worker(s). Technical support will be overseen by HortLangSon and also involve the District Extension Station;
- (vi) Assist the Producer Groups to gather the information required for the Output 3 Quarterly Reports.
- (vii) Ensure that the costs associated with supporting the Output 3 activities are included in the commune's Annual Plan and Budget. Note: The Project will not provide funding to the Commune People's Committee for Output 3 coordination and for technical service delivery. Therefore, the commune must ensure that their annual budget submitted to the DPC includes an adequate allocation for their Output 3 coordination, extension and other support tasks.

IV. Output 3 Implementation

316. Section 3 Output 3 Implementation is a major section aimed at the staff in the provincial and district agencies, units and departments and the communes that will be involved in Output 3 implementing including:

- (i) PMU
- (ii) HortLangSon Service Provider
- (iii) Departments
- (iv) District: DPC, divisions and service units
- (v) Officials at commune level
- (vi) Product Group leader and members
- (vii) Producer Group leaders and members

A. Contents of this Section

317. Chapter IV describes the implementation tasks associated with:

- (i) Output 3.1 Horticultural Industry Organization Development
- (ii) Output 3.2 Star Anise Product Value Chain Development
- (iii) Output 3.3 Safe Vegetable Product Value Chain Development, and
- (iv) Output 3.4 Other Product Value Chain Development

318. **Implementation Schedule:** The Advance Action procurement of the HortLangSon Service Provider will enable implementation to commence soon after Loan Effectiveness. The implementation schedule Figure 14 below shows the proposed implementation over the life of the project. Main features of the proposed implementation schedule for the outputs are:

319. Output 3.1 Horticultural Industry Organization Development –

- (i) Service Provider contracted
- (ii) Service Provider inception
- (iii) Sector strategic plan –HSSP -prepared including business plan
- (iv) Commence HortLangSon establishment
- (v) HortLangSon board appointed
- (vi) Commence HortLangSon operations
- (vii) Product Group formation HortLangSon providing some services to horticultural sector members

320. Output 3.2 Star Anise Product Value Chain Development

- (i) Plan star anise value chain development
- (ii) Initiate star anise value chain development activities including Producer Group development
- (iii) Monitoring and support for star anise value chain development activities

321. Output 3.3 Safe Vegetable Product Value Chain Development Plan safe vegetable value chain development

- (i) Initiate safe vegetable value chain development activities including Producer Group development
- (ii) Monitoring and support for safe vegetable value chain development activities

322. A detailed schedule has been prepared and is presented in Figure 14 below.

B. Output 3.1 Horticultural Sector Industry Organization

323. Output 3.1 Horticultural Sector Industry Organization contains the main Output 3 investment activities provides the foundation for Output through the formation of the Horticultural Sector Industry Organization (HortLangSon), and its subsequent development as a supplier of sector services. HortLangSon through the contracted Service Provider will lead the implementation of main Output 3 development activities. The purpose of this Manual section is to present the:

- (i) Main tasks that will be undertaken in each of the eight Output 3.1 activities;
- (ii) HortLangSon experts who will be responsible for the tasks;
- (iii) Proposed timing of the tasks.

324. Priority task: Procurement of the HortLangSon Service Provider will be an Advance Action and the PMU will be assisted with this by the PPTA consultants. Advance actions are:

- (i) Prepare the Request for Proposal;
- (ii) Seek Expressions of Interest
- (iii) Seek proposals, and evaluate these
- (iv) Select preferred proposal and negotiate
- (v) Prepare draft contract
- (vi) Contract Service Provider

1. Activity 3.1.1 Service Provider Inception

325. Details of the main implementation tasks to be undertaken and the responsible agency for the Output 3.1 activities are shown below in the series of tables below:

Table 58: Output 3.1.1 Tasks and Responsible Agencies

| Activity 3.1.1 Implementation and Contract Supervision Service Provider appointed | | |
|--|-----------------------------------|---------------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Procurement of Service Provider | PMU - Advance Action as above | To March 2018 (Project month 1) |
| 2. Service Provider Contracted | PMU | By the end of Project month 2 |
| 3. Service provider undertakes inception tasks: Inception Report –situational assessment, review of terms of reference and any proposed changes, and workplan – (<i>within six weeks of contracting</i>) | Service Provider supported by PMU | Mid Project month 3 |

326. The PMU/DPI Lang Son will use advance action to recruit a service provider by preparing expression of interest (EOI) and request for proposals (RFP) prior to loan signing.

327. The service provider will be a national agribusiness service company that has a track record in agribusiness value chain support and with direct experience in international marketing

of Vietnamese products, market research and quality control, logistics and trade and logistic services that are linked to developing value chain linkages for inclusiveness of small producers, women and local service providers within Lang Son province. Government-owned enterprises in the borrower's country may participate as a bidder only if they can establish that they (i) are legally and financially autonomous, (ii) operate under commercial law and (iii) are not dependent agencies of the borrower or sub-borrower.

328. The Service provider will report directly to the PMU until the board of Governor/Directors for HortLangSon is established. Once established the DPI/PMU Project Director will sit on the Board and the service provider will take guidance from the HortLangSon Board whilst reporting to the Project Director.

329. Annual work plans will be required from the service provider with defined milestones for the following activities:

- (i) Establishing HortLangSon – to work with a stakeholder groups comprising industry leaders from the private and public sector in Lang Son. Activities will include
 - (a) board and governance establishment,
 - (b) strategic plan with supporting business model and operation guidelines,
 - (c) executive and operational establishment
- (ii) Industry and subsector market and quality assessments – these will be conducted by the service provider working with commodity groups with an agreed memorandum of understanding signed between HortLangSon (Board), the agribusiness service provider, and the respective commodity associations. All market information will be held by both the association and HortLang Son and will be accessible by the public-sector board members for use in their service functions.
- (iii) Quality assurance systems will be defined by the service provider for each subsector based on the market assessments conducted.
- (iv) Value chain financing and support program – the proposed systems will be defined with supporting operational manuals, clear systems for promoting applications, clear criteria with proposed outlines for submitting applications and the required supporting documentation, transparent review and assessment processes for the applicants for competitive grant awards, an approval process where DPI and PPC validate recommendations but are not directly involved in the review process, monitoring and reporting systems. The service provider will establish these systems being guided by the criteria included herein and agreements between the ADB and the respective EAs. ADB will have the right to prior review of all procedures and financing awards.
- (v) Producer linkages will be formed both horizontally through producer groups and vertically through supply linkage requirement for both enterprises and producer groups to access project financing. Groups will receive support in preparing business plan application and the adoption of quality assurance and crop planning systems to enable supply agreement to be developed.

330. Once appointed the Service Provider will undertake inception tasks that include inception visits to main sector agencies, agri-enterprise and to the districts. During these visits the Service Provider will take the opportunity to create awareness about Output 3, the establishment of

HortLangSon and its horticultural sector development role. The awareness is an important foundation leading to the next activity establishment of HortLangSon, the strategic planning exercise, including the HortLangSon business plan. The Service Provider will complete six week inception period and the output will be:

331. Draft Inception Report –submitted to PMU for approval.

2. Activity 3.1.2 Sector Transformation Group and HortLangSon Interim Board

Table 59: Output 3.1.2 Tasks and Responsible Agencies

| Activity 3.1.2 HortLangSon Established and Operational | | |
|--|--|------------------------|
| Main Tasks | Responsible Agency | Timing |
| ➤ Form the Horticultural Sector Transformation group | PMU with PPC input | Project month 1 |
| ➤ Sector awareness program about Output 3 and HortLangSon ➤ Consultation meetings with sector members | Service Provider with support from PMU – Team Leader and Information Systems and Outreach expert | Project months 2 to 10 |
| ➤ Organise the legal basis for HortLangSon ➤ Develop HortLangSon constitution | Service Provider and PMU – PMU responsible for all legal aspects | Project month 2 |
| ➤ HortLangSon established and interim board appointed | PPC to appoint interim board | Project month 4 and 5 |

332. Formation of the Horticultural Sector Transformation Group will provide a high level strategic input to the development of HortLangSon. The Sector Transformation Group will be responsible to the PPC to oversee and guide the establishment of HortLangSon including the appointment of the Interim Board (see terms of reference in Appendix 4). Subsequently the Sector Transformation Group will ensure that the strategies and plans for the sector's development align with the PPC policies. The Sector Transformation Group will be formed in the first month of the project and will work closely with the PMU and Service Provider (once appointed) to get HortLangSon established and get the key initial activities underway – the HSSP being a priority.

333. Appointment of the interim HortLangSon board will involve consultation with the main agri-enterprises active in the horticultural sector and supporting service sectors including finance and credit. Sector members will be encouraged to nominate candidates. HortLang Son will facilitate the board search process that will involve a profiling exercise whereby the characteristics required in a board member are defined. The Service Provider will develop a shortlist of suitable candidates with the PMU, the Sector Transformation Group, and the PPC will be responsible for making the appointments.

334. Involving the horticultural sector members in the establishment of HortLangSon is essential. This will be a challenging task at the start of the project as HortLangSon will represent the whole sector: farmer producers, small and bigger traders, processors, marketers, service

providers, and retailers. The Service Provider will need to work closely with the private sector and the public sector: DARD, DOST, Women's Union, Farmer's Union, and DOIT and utilize their network of sector contacts in order to establish the connection with the whole sector. The DPCs and their agricultural service units will also need to be involved.

335. It is recognized that some sector members will have limited governance experience and the Service Provider will mentor the interim HortLangSon board. An Output 3 feature is the governance accelerator program that will initially focus upon the women and men members of the HortLangSon Interim Board (the governance accelerator for women is included as part of the GAP). The governance accelerator program will be further developed for Product Groups and also for the leadership of the Producer Groups. The governance accelerator program will be developed and implemented by the Service Provider in conjunction with the Lang Son Business Association. The purpose being to develop the Business Association's training capacity and portfolio of courses that will enable them to play a much bigger role in sector business capacity development in the future.

336. The HortLangSon Secretariat will be initially staffed for the first three years by the Implementation and Contract Supervision Service Provider. The Service Provider Team Leader will be the interim HortLangSon Chief Executive Officer and will fill this position for the first three years of the project. It is intended the HortLangSon will start to recruit staff from year 2 of the project.

337. The mid-term review will assess the status of HortLangSon and will consult with the PMU and PPC about the contracting of HortLangSon staff including a Chief Executive Officer. One staffing option that will be considered is the secondment of public sector personnel for a minimum period of 18 months. The Service Provider would mentor these staff and if they perform well then they may be offered a permanent position in the HortLangSon Secretariat requiring them to transition out of the public sector.

338. HortLangSon has not been formed to take over the role and functions of the provincial departments. HortLangSon will be a sector industry organization that represents the private sector members of the horticultural industry. HortLangSon's core functions will be complementary to the functions of the Lang Son departments. This will require a partnership between HortLangSon and the departments.

339. The partnership approach will be activated through a Horticultural Sector Transformation Group (see Section III and terms of reference in Appendix 4) that will consist of the departments and HortLangSon. The Horticultural Sector Transformation Group will be a high level body and will consist of the heads of the main departments, the HortLangSon Chief Executive Officer and be chaired by PPC Vice Chairperson responsible for the project. Ensuring that there are consistent policies and that provincial resources are effectively and efficiently applied for horticultural sector development will be one role for the Horticultural Sector Transformation Group.

3. Activity 3.1.3 Horticulture Sector Strategic Planning

340. The horticultural sector strategic planning: HSSP exercise will is a critical task that will provide the foundation for sector development under Output 3. The Service Provider will prepare the HSSP that will include a market assessment for the main Lang Son sector commodities. Preparation of the HortLangSon business plan will be undertaken in parallel to the HSSP.

341. The rationale for this Activity is that a strategic review of the Lang Son horticultural sector

is required before any market assessment can be made and the HortLangSon business plan can be prepared. The HSSP provides a major opportunity for engagement across the horticulture sector, and to ensure that the members start to have high level of “ownership” of HortLangSon and the plans for the sector’s development.

Table 60: Output 3.1.3 Tasks and Responsible Agencies

| Activity 3.1.3 Horticulture Sector Strategic Planning | | |
|---|---|------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Prepare for HSSP | Service Provider with support of Sector Transformation Group and Lang Son departments | Project month 4 |
| 2. Complete wide sector consultation | Service Provider with support of Lang Son departments, districts, private sector members, | Project months 4 and 5 |
| 3. Prepare strategic plan | Service Provider | Project month 5 |
| 4. Complete an overall market assessment for main Lang Son commodities (as part of strategy exercise) | Service Provider with DOIT, and private sector members | Project month 5 |
| 5. Prepare the HortLangSon business plan | Service Provider | Project months 5 and 6 |
| 6. Submit strategic plan and business plan to HortLangSon board for approval – then to PMU and PPC | Service Provider | Project month 7 |

342. The HSSP will build on an analysis of the horticultural sector and its current situation as well as market opportunities. A key focus of the plan will be to assess the needs of a modern market led horticultural sector. The design approach features moving from Product supply models to product based value chains and the strategy development must also assess each product, their markets and potential actors for moving into value chains, and determine their potential for development. Market assessments are essential for defining marketing strategies for the sector and for the main products. Project funded activities are limited to horticultural products with clearly defined market needs, standards and clear options for accessing these markets, The strategic planning exercise must:

- (i) Define the overall strategic approach for Lang Son horticultural sector development;
- (ii) Assess the main sector commodities and prioritise these based upon their market prospects, production methodologies, agri-enterprise facilities and value adding equipment, and the potential for modern value chain development;
- (iii) Identify (and confirm) the role and key functions for HortLangSon, and present these in the HortLangSon business plan;
- (iv) Outline the role of provincial government in policy development to enable sector growth and development;
- (v) Define the roles of departments and other agencies to facilitate sector

development.

343. The purpose of the market assessment is two-fold: (i) scope the market potential for the most significant horticultural crops grown in Lang Son, and; (ii) confirm the market potential for the first value chain activities: star anise and safe vegetables. For both star anise and safe vegetables this is a stop/go exercise and if the market assessment does not justify the proposed Output 3 investment then either (i) a reduced investment may be proposed, or (ii) a replacement Product value chain will be selected. Other key features of the sector strategic review will be:

- (i) Initial ranking of Product value chains for investment support by the project;
- (ii) An agreement with the Sector Transformation Group for the five Product Groups to be assisted by the project.

344. The Lang Son PPC is a key stakeholder in the strategic plan and must be actively consulted in its preparation. The PPC has number of objectives that need to be incorporated in the plan and these include:

- (i) Increased processing and value adding in the province to increase employment and generate more income;
- (ii) Encouraging outside investment in the horticultural sector.

345. The strategic plan must align with the 2016-2020 provincial Socio-Economic Development Plan horticultural sector priorities.

346. Outputs from Activity 3.1.3 will be:

- (i) Strategic Plan for the Horticultural Sector;
- (ii) Market Assessment;
- (iii) HortLangSon Business Plan.

347. The HortLangSon board will receive the HSSP, Market Assessment and the Business Plan and it will be submitted to the PMU, and the PPC for final approval. Following the PPC approval decision it will be widely communicated to all sector members and will be publicly notified on the PMU, HortLangSon and departmental websites (Activity 3.1.9).

4. Activity 3.1.4 HortLangSon Secretariat Establishment

348. Establishment of HortLangSon will be initiated through the appointment of the Interim Board and preparation of the legal basis for HortLangSon (Activity 3.1.2 above). Following the preparation of the HSSP and the HortLangSon business plan the Service Provider will commence to develop HortLangSon Secretariat. Once the Secretariat is established and operational the Service Provider will commence to develop the HortLangSon sector services (see Figures 8 and 9). Development of the main services is described below under Activities 3.1.6, 3.1.7, 3.1.8, 3.1.9, and 3.1.10.

Table 61: Output 3.1.4 Tasks and Responsible Agencies

| Activity 3.1.4 HortLangSon Secretariat Establishment | | |
|---|-----------------------------------|-------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Secretariat established and | Service Provider with PMU support | Project month 5 onwards |

| Activity 3.1.4 HortLangSon Secretariat Establishment | | |
|--|--|------------------------------|
| Main Tasks | Responsible Agency | Timing |
| operational | | |
| 2. Implement HortLangSon business plan | Service Provider, with PMU and board support | Project month 5 onwards |
| 3. Initiate Competitive Grant program | Service Provider | From Project month 5 onwards |
| 4. Develop the core HortLangSon functions (through Activities 3.1.7 to 3.1.10) - ongoing task | Service Provider | From Project month 5 onwards |
| 5. Develop HortLangSon as sector industry organization (on-going task) | Service Provider | From Project month 5 onwards |
| 6. Mentor Interim board | Service Provider | From Project month 5 onwards |
| 7. Commence to work with Product Groups, departments, and other sector stakeholders to implement HSSP, and product development plans | Service Provider | From Project month 5 onwards |

5. Activity 3.1.5 Product Groups Formed and Development Plans Prepared

349. Formation of the Product Groups is a cornerstone of the horticultural sector's development as a means for developing coordination amongst smaller producers and enterprises. They will be the constituent members of HortLangSon the services provided by HortLangSon will support their development into modern value chain businesses. It is proposed that there will be five Product Groups formed over the first three years but these need to be confirmed by the HSSP. The Agricultural Producer Groups and Market Linkages expert, with the support of the Team Leader, will lead the formation of the Product Groups. The role and function of the groups, and their formation is outlined in Section V.

350. Product Group formation will provide the platform for development of the product value chains. Once the product groups are formed they will be assisted by the Service Provider to prepare their strategy and an action plan for their product value chain development. Star anise (once confirmed by the HSSP) will be first product value chain that the Service Provider will support. Safe vegetables will be second. It emphasized that the Product Groups must be inclusive of all product sector members – from producers to processors, retailers, and service providers. Each Product Group will be assisted to prepare their sector development strategy and plan. Product sector planning must address the needs of the all the sectors and the whole value chain.

351. Product value chain development will be facilitated through the Competitive Grants (Activity 3.1.6) especially the Viability Gap Grants for Enterprises, and also the Producer Group grants (see Section V for more information on the operation of the Competitive grants). Several other activities will also support the initial and ongoing development of the Product value chains. The HortLangSon service functions especially in Trade and Market Information, and Quality Assurance and Compliance, as well business planning, will be available to assist all value chain members. Service Provider and HortLangSon support services will be available for all Product group members, this includes agri-enterprises that do not have viability gap grants.

352. More details for the proposed development activities for star anise and safe vegetables are presented below in Section B Star Anise Value Chain Development, and Section C Safe Vegetables Value Chain Development respectively.

Table 62: Output 3.1.5 Tasks and Responsible Agencies

| Activity 3.1.5 Product Groups formed and Development Plans prepared | | |
|--|--|--|
| Main Tasks | Responsible Agency | Timing |
| 1. Priority Product groups identified from strategic plan exercise | Service Provider - Team Leader, and Agricultural Producer Groups and Market Linkages expert | Project month 4 |
| 2. Star Anise Association assisted to form first Product Group and become operational (on-going) | Service Provider - Agricultural Producer Groups and Market Linkages expert | Project month 6 to 9 |
| 3. Prepare star anise sector development strategy and business plan (including annual operational budget) | Service Provider - Agricultural Producer Groups and Market Linkages expert and Financing and Grant Management Expert | Project month 8-10 |
| 4. Star anise Product Group members apply for Competitive grants | Service Provider - Agricultural Producer Groups and Market Linkages expert and Financing and Grant Management Expert | See Activity 3.1.6 and Output 3.2 activities |
| 5. Safe vegetables Product Group formed and assisted to become operational (on-going) | Service Provider - Agricultural Producer Groups and Market Linkages expert | Project month 14-16 |
| 6. Prepare safe vegetables sector development strategy and business plan (including annual operational budget) | Service Provider - Agricultural Producer Groups and Market Linkages expert and Financing and Grant Management Expert | Project 16-18 |
| 7. Safe vegetable Product Group members apply for Competitive grants | Service Provider - Agricultural Producer Groups and Market Linkages expert and Financing and Grant Management Expert | See Activity 3.1.6 and Output 3.3 activities |
| 8. Other Product Groups formed based on strategic plan priorities (from year 2 or 3 onwards) | Service Provider - Agricultural Producer Groups and Market Linkages expert | To be determined later |

6. Activity 3.1.6 Competitive Grants- Viability Gap Grants

353. HortLangSon through the Service Provider will implement the grants procedures including the formalization of the procedures to be used, defining the administration of the grant proposal, grant evaluation and grant award process and seek the PPC approval of such processes. The PMU will manage the approval process and contracting. Approval of all Viability Gap Grants for Enterprises over \$50,000 will be evaluated by a committee comprising HortLangSon, PMU and the Service Provider. The HortLangSon Board will formally submit a recommendation to the PPC for ratification (see Section VI Competitive Grants).

354. Grant eligibility conditions are shown in Appendix 2 of this Manual. These conditions will form the basis of the final grant regulations that will be prepared by the Service Provider and endorsed by the PMU. The Service Provider will use the experience of the International Fund for Agricultural Development (IFAD) and their grant procedures and documents to inform the preparation of the Output 3 grant program.

355. Grant awareness is a vital task and will need a comprehensive awareness program in the first 18 months of Output 3. Awareness will be part of the Product group and value chain planning and development in Activity 3.1.7. The awareness program must ensure that all value chains members are aware of the Viability Gap grants and that they apply to small as well as the bigger agri-enterprises. Further these grants will require evidence of inclusiveness of smaller or more remote producers in the value chain. There will also be support provided to some grant applicants in the preparation of their business plans which will be the core documents for their grant applications. Particular emphasis must be given to supporting women entrepreneurs with their business plans and applications. Under the smaller Viability Gap Grants for enterprises, women entrepreneurs will be encouraged and supported to apply for grants. Women entrepreneurs include:

- (i) women that own and operate small district based processing and trader operations, and;
- (ii) commune women who want to develop small businesses to add value to horticultural products produced in their communes.

356. The Service Provider will need to work with the PMU Gender specialist and the district Women's Union with these grants for smaller agri-enterprise development.

357. Competitive grants also include the Producer Groups grants through the block grant mechanism. Details about the Producer Group Grants are in Section VI.

358. Following the awarding of grants the grantees will be provided with regular advice and assistance by the Service Provider to implement their business plans.

Table 63: Output 3.1.6 Tasks and Responsible Agencies

| Activity 3.1.6 Competitive funding mechanism established and operational | | |
|---|---|-----------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Prepare the grant procedures, formats, timetable etc. | Service Provider | Project month 11-13 |
| 2. Undertake grant awareness program with timetable for the various grants (Activity 3.1.8) | Service Provider- Financing and Grant Management Expert and Information Systems and Outreach expert | From project month 11 |

| Activity 3.1.6 Competitive funding mechanism established and operational | | |
|---|--|--------------------------|
| Main Tasks | Responsible Agency | Timing |
| 3. Finalise regulations for all grants to be approved by PMU | Service Provider with PMU - Financing and Grant Management Expert | Project month 13 |
| 4. Advice and training for potential applicants | Service Provider with PMU- Financing and Grant Management Expert | Project month 13 onwards |
| 5. Formally initiate grant process: advertise, and encourage enterprises to apply | Service Provider with PMU- Financing and Grant Management Expert | Project month 15 |
| 6. First Round of Viability Gap Grants closes Project Month 16 | | |
| 7. Receive applications, evaluate and make recommendations to PMU | Service Provider with PMU- Financing and Grant Management Expert | Project month 17-19 |
| 8. Grant approval | PPC for Viability Gap grants | Project month 20 |
| 9. Contracting | PMU | Project month 20 |
| 10. Program to support grantees | Service Provider- Financing and Grant Management Expert, and other experts | Project month 20 onwards |

359. Disbursement of funds to successful grant applications will be based on the enterprise conducting its own procurement with its 51% contribution used to cashflow and secure any purchases.²⁹ Once purchases are completed, procurement documentation including supplier invoices, statements and supporting product documentation will be used to support an invoice from the enterprise to BIIG1 PMU within DPI. The invoice and supporting documentation will be forwarded to the Service Provider who with assistance from the PMU will conduct a verification of purchase and installation through a field visit and site inspection.

360. The inspection will reconcile the proposed investment items within the business plan viability grant proposal with the actual purchases made with supporting documentation, and verifying that conditionalities relating to inclusivity through value chain linkages have been implemented. Compliance with project environmental safeguard policies must also be verified during the site visit. Once confirmed, the service provider will make a recommendation for payment that will be forwarded to the PMU by the HortLangSon Board of Directors.

361. The PMU will action the payment based solely on the verification report. Once received the PMU will process the invoice in full within the currently monthly transactions.

362. The PMU will retain all original documentation and use this as part of its record for reimbursement of the advance account using ADB Statement of Expense mechanism.

²⁹ For grants under \$30,000 the business contribution is 20%.

7. Activity 3.1.7 Trade, Markets and Quality Information

363. Output 3 features a market led approach to Product value chain development. Lack of market and trade information contributes to the viability gap that the horticultural sector members face in the growth and development of their businesses and modern value chains. Providing trade and market logistics information to sector members will be one of the core HortLangSon functions that will be developed in response. Following the preparation of the sector strategic plan the Service Provider will commence developing the core HortLangSon service functions. Development of the service functions of Trade and Market data and Quality Assurance and Compliance systems (Activity 3.1.8- see below) will be coordinated. Trade and market logistics information services will be led by the Market and Trade Logistics expert. The initial emphasis will be upon trade and market data for the priority five products identified in the sector strategic plan, that will include star anise and safe vegetables.

364. Development of the trade and market data services function will be coordinated with the DOIT, and must not duplicate the systems and data services that the DOIT has in place. The aim will be to develop a market and trade information platform for sector members and this should be integrated with the DOIT information system.

Table 64: Output 3.1.7 Tasks and Responsible Agencies

| Activity 3.1.7 Trade, Markets and Quality Information provided to members | | |
|--|--|-------------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Identify the trade and market information gaps during sector strategic plan exercise (ongoing through sector discussions) | Service Provider – Team Leader and Market and Trade Logistics expert | Project month 5 and 6 |
| 2. Develop the HortLangSon systems to provide trade and market information (on-going) | Service Provider - Market and Trade Logistics expert and Information Systems and Outreach expert | Project month 7 onwards |
| 3. Prioritise assistance to Star anise and safe vegetables Product groups: agri-enterprise grantees, Producer Groups and other value chain members | Service Provider - Market and Trade Logistics expert | From project month 11 onwards |

8. Activity 3.1.8 Quality Assurance and Compliance Systems Established

365. Quality assurance systems that ensure that the horticultural products meet national and international standards are required for Lang Son to develop a strong “export” industry that is aligned to the markets being targeted. Implementing this activity will involve HortLangSon working closely with DARD, DOST and DOIT. All of these departments have made contributions to quality assurance systems that some agri-enterprises have initiated. A well-coordinated market linked approach is required that enables the products to comply with the highest standards demanded by national retail and export markets. It is proposed that the United States of America Food and Drug Administration act of 2011 standards be set as the benchmark. HortLangSon, with the

departments, will need to develop a roadmap to achieve this and adopt these standards to those required by the target markets. There is some traceability expertise developed in Viet Nam and this should be integrated with the quality assurance systems. There are two Service Provider staff that will lead the quality assurance development: Quality Assurance and Compliance Systems expert, and Post-Harvest Systems and Value Chain expert. As mentioned above the development of Quality Assurance systems will occur in coordination with the trade and market information service function.

366. Star anise will be the first product value chain to develop improved quality assurance systems for export markets, including traceability. This is to reinforce the market led approach under Output 3 where star anise development is an exemplar. The experience and lessons learned from the star anise development will be applied to the other Product value chains. The underlying theme for star anise development is “value not volume” and to be able to compete with the Chinese processors on the basis of quality in high value markets. One of the challenges is to develop a Lang Son star anise quality strategy that features natural production advantages of Lang Son. This may involve the rationalization of the use of the GI, and Lang Son “trade mark”. However, the priority is to be able to provide clear quality assurance to buyers and where necessary the ability support this through product traceability.

Table 65: Output 3.1.8 Tasks and Responsible Agencies

| Activity 3.1.8 Quality Assurance and Compliance systems established | | |
|---|---|-------------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Identify the quality assurance gaps during sector strategic plan exercise | Service Provider- Quality Assurance and Compliance Systems expert and Post-Harvest Systems and Value Chain expert | Project month 5 and 6 |
| 2. Develop the HortLangSon program to provide quality assurance services to sector members – Integrated with 3.1.7 | Service Provider- Quality Assurance and Compliance Systems expert and Post-Harvest Systems and Value Chain expert | Project month 12 onwards |
| 3. Prioritise assistance to Star anise and safe vegetables Product groups: agri-enterprise grantees, Producer Groups, and other value chain members | Service Provider- Quality Assurance and Compliance Systems expert and Post-Harvest Systems and Value Chain expert | From project month 12 onwards |

9. Activity 3.1.9 Sector Outreach and Education

367. Sector outreach will be the first activity initiated as communications with the sector members is a necessary foundation for successful implementation of Output 3. The Information Systems and Outreach expert and the Team Leader will prepare and lead the implementation of the outreach plan. Outreach, however, will be the responsibility of all the Service Provider team members and they all will contribute to creating an awareness of Output 3 across the sector, targeted at all sector members. BIIG 1 is an inclusive project and Output 3 gender activities features the active involvement of women in horticultural sector development that includes the

farmer producer level, smaller agri-enterprises in the districts and also the larger agri-enterprises. Therefore, the outreach programs must ensure that it reaches all stakeholders, especially the women farmers and small business operators as well as poorer smallholders. Output 3 design and the GAP framework highlights the use of best practice communications methods for working with ethnic minorities and women and use of techniques for low literacy people. The Service Provider will ensure that its staff have a high level of competence in these methods and techniques, and that the counterpart staff: district extension staff etc., are also trained in these methods and techniques.

368. The sector education role refers to education in the widest sense and involves training, and HortLangSon delivering an ongoing program to the sector members where they learn about what a market led horticultural sector development approach involves. The HortLangSon outreach program will provide a regular series of communications activities that will ensure all sector members are made aware of what is involved in a more commercial horticulture sector including export market requirements, quality assurance, postharvest management and other modern value chain features.

369. Training will be delivered based upon formally assessed needs. Developing capacity will be a big challenge for the Service Provider as Output 3 introduces a whole new commercial market led development paradigm to Lang Son's horticultural sector. The focus of the training and education program is to develop institutional capacity in both the private and government sectors that will meet the evolving needs of an export orientated horticultural sector. The training spectrum will be wide and encompass business, marketing and trade, technical production, quality systems, leadership and governance. Training will be more focused in main areas:

- (i) Building the capacity of leading sector members in governance and management of sector organisations – HortLangSon and Product groups. Training for women sector members in governance is the one prescribed training topic included in the design (as part of the GAP).
- (ii) Star anise and safe vegetable Product value chain members including the Producer Groups – The training spectrum will be wide and encompass business, marketing and trade, technical production, quality systems, farmer group leadership;
- (iii) Product groups members i.e. other than star anise and safe vegetable Product groups in such topics as marketing and trade, quality management etc.;
- (iv) Department and district staff –to enhance their sector support roles in such aspects as quality assurance, modern production methods etc.

370. The sector outreach program must be initiated once the Service Provider commences, and will evolve as the outreach and education needs are better identified. Main Outreach and Education tasks for the first 18 months are presented in Table 66 below.

Table 66: Output 3.1.9 Tasks and Responsible Agencies

| Activity 3.1.9 Sector Outreach and Education | | |
|---|---|-------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Prepare an outreach plan for the first year that features: Output 3 awareness; HortLangSon | Service Provider- Team Leader and Information Systems and Outreach expert | Project month 5 onwards |

| | | |
|---|--|--------------------------|
| role and establishment; Product group development | | |
| 2. Initiate gender governance programs- awareness, prepare and deliver programs | Service Provider- Team Leader and Information Systems and Outreach expert | Project month 6 onwards |
| 3. Develop the outreach program for star anise Product Group formation | Service Provider - Information Systems and Outreach expert and other experts | Project month 6 onwards |
| 4. Competitive grants Awareness program – for star anise Product group | Service Provider - Information Systems and Outreach expert and other experts | Project month 11 onwards |
| 5. Complete a training needs assessment and prioritize training courses: First for star anise Product Group | Service Provider - Information Systems and Outreach expert | Project month 12 |

10. Activity 3.1.10 Design and implement system to monitor and assess sector performance

371. The aim of the activity is to develop an online system to provide better data about the horticultural sector's production and financial performance. Activity 3.1.10 design and implement system to monitor and assess sector performance should not be confused with the project's PPMS. Currently there is some data gathered by provincial departments on production areas, output and economic performance, but this does not provide adequate information to plan and guide the sector's development. For instance, there is little information about the quantities of horticultural crops that are sold through the border gates to China. DARD, DOIT, and the provincial Government Statistics Office will be the main partners in the execution of this activity.

372. HortLangSon will develop a coordinated online information system that complements, and includes (as much as possible) the data gathered by the Lang Son departments – it must not be developed a parallel project only system. The intention is for the provincial departments to learn how to better use the sector data for planning and advise the PPC on sector development in partnership with HortLangSon. Data from the Output 3 system will be made available to the provincial departments. Using sector data for strategy and planning will be one of the key roles of the Sector Transformation group, and used to advise the PPC.

Table 67: Output 3.1.10 Tasks and Responsible Agencies

| Activity 3.1.10 Design and implement system to monitor and assess sector performance | | |
|---|--|----------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Review sector data and assess data needs for planning and management | Service Provider-Team Leader and Information Systems and Outreach expert | From project month 6 and 7 |
| 2. Develop sector | Service Provider- | Commence project month 11 |

| | | |
|---|---|-----------------------|
| information system (ongoing task) | Information Systems and Outreach expert | January 2019 |
| 3. Work with provincial agencies and Product groups to gather data | Service Provider, provincial departments and Product groups | From project month 13 |
| 4. Work with provincial agencies and Product groups to use the data for sector planning and management- DPI and Sector Transformation Group | Service Provider, provincial departments and Product groups | From project month 16 |

C. Output 3.2 Star Anise Value Chain Development

373. The star anise sub sector was identified by the PPTA design mission as the first Product group and value chain to be assisted under Output 3. The PPTA proposal needs to be confirmed by the horticultural sector strategy exercise and associated market assessment. The market assessment must confirm that there are sound market prospects for the star anise products and that it is feasible to develop these with the assistance from the project. It is expected that the horticultural sector strategy exercise will confirm the PPTA proposal. But if the proposal to develop the star anise sector is assessed as not a viable option then the HortLangSon board and the PMU will need to decide the replacement Product and value chain that will be developed. The Service Provider will make the recommendation to the board and the PMU.

374. All the Output 3 investments will be undertaken under the various Output 3.1 activities. The direct investments that support the star anise value chain development are 3.1.6 Competitive Grants (see above, and Section IV). The grants are available for the larger star anise agri-enterprises involved in processing and marketing, smaller star anise agri-enterprises that collect and aggregate, and process star anise. The grants will also assist the Star Anise Producer Groups. Development of the Star Anise Association into a wider functioning Product Group that will represent all sector members will be facilitated by HortLangSon (Activity 3.1.5).

1. Output 3.2.1: Prepare Plan for Star Anise Value Chain Development

375. Star anise value chain development must be based around a balanced approach that includes dialogue with the star anise sector members including farmers, and the small and larger agri-enterprises. This will be achieved through the star anise Product Group that will be formed through Activity 3.1.4 Product Groups. The development of the Star Anise Association into a product group that is more representative of the whole Lang Son star anise sector will provide the basis for dialogue with the members, and ensure that they contribute to the star anise sector development.

Table 68: Output 3.2.1 Tasks and Responsible Expert

| Activity 3.2.1 Star Anise Value Chain Development Plan | | |
|---|--|-------------------------|
| Main Tasks | Responsible Expert | Timing |
| 1. Awareness program for star anise sector members (Activity 3.1.9) | Service Provider- led by Team Leader and Information Systems and Outreach expert | August to November 2018 |

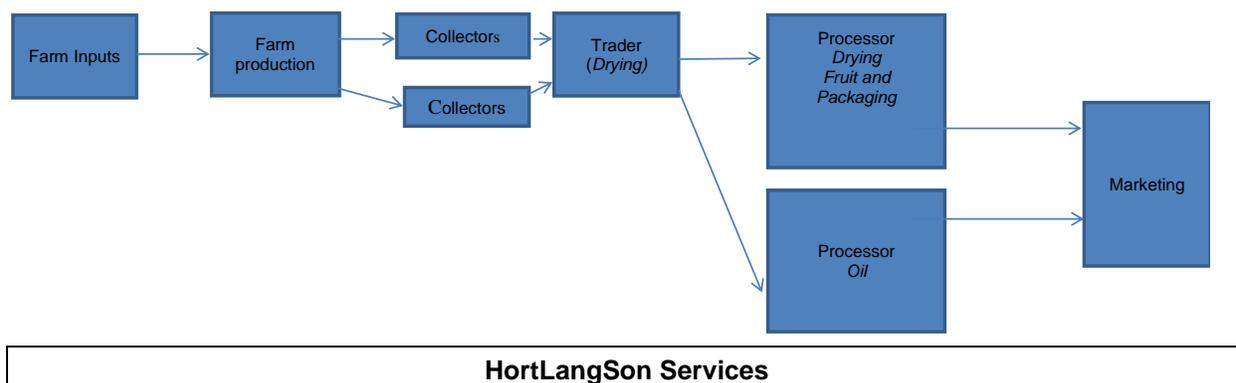
| | | |
|--|--|-----------------------|
| 2. Consult with star anise sector members and prepare star anise sector development plan | Service Provider –led by Team Leader and Agricultural Producer Groups and Market Linkages expert | January to March 2019 |
| 3. Prepare an Action Plan that features the Output 3 support for sector development: | Service Provider –led by Team Leader and Agricultural Producer Groups and Market Linkages expert | April 2019 |

376. Preparation of the star anise development plan will be built upon a detailed market and trade assessment and the horticultural sector strategic plan, and address the issues that are identified by the star anise Product Group members. There must be wide consultation with all the value chain members. Consultation will be achieved through the district level Product Group committees, and with assistance from the Lang Son Business Association network. Once the Product Groups are formed and registered they will be members of the Business Association. The Star Anise Product action plan will define the main actions that will be undertaken. Many of the actions will be connected to the Output 3 activities, but there some actions that the Product Group may initiate and lead themselves e.g. raising policy issues with provincial departments, or with districts. One of the roles of the Service Provider and HortLangSon is to empower the Product Group to take increasing responsibility for dealing with star anise industry issues and to provide access via the transformation group. The star anise sector development plan and the associated action plan will be endorsed by the HortLangSon board. The plan will also be shared with the Transformation Group, the departments, and other key stakeholders. It is emphasized that Product Group ownership of the plan is vital and the members use the plan as the basis for the development of their business activities.

377. Star anise Product value chain development involves several activities and there are a number of different agencies involved. Figure 15 below presents the main stages in the star anise value chain and shows:

- (i) The main services that HortLangSon will provide to the value chain members;
- (ii) Output 3 Investment activities (through the Competitive grant program) for each value chain stage, and;
- (iii) The agencies responsible for the main project tasks for each value chain stage.

Figure 15: Star Anise Value Chain showing Project Services and Investment



| | | | |
|--|---|--|---|
| Star anise strategic and market plan; Form star anise Product Group (based on Star Anise Association); Trade, market and quality assurance information; Operational quality assurance systems: standards, traceability; Outreach program – awareness, information, education for Product group members; Star anise data gathering and management use | | | |
| Assist to prepare farmer group business plan & Technical and marketing production advice | Assist businesses to prepare grant application & Technical advice | Assist businesses to prepare grant application & Technical support | Assist to prepare marketing grant applications & Marketing advice and support |
| Output 3 Investment Activities | | | |
| Block Grant –Fund inputs for farmer groups: Feeder roads; Harvest equipment; Fertilizer etc.; group registration; technical advice | Business grants (small) | Business grants | Marketing grants |
| Responsible Agency for Implementation Support | | | |
| HLS, District, CPC, farmer group | HLS – & other departments | HLS -& other departments | HLS - & other departments |

2. Implement the Star Anise Value Chain Development Plan

378. The Service Provider will be responsible for the implementation of the star anise value chain development plan, through the action. Development and action plan implementation is presented the manual under two separate activities: Activity 3.2.2 for the agri-enterprises, and Activity 3.2.3 for the Producer Groups.

379. The Competitive grant program is the investment driver for the implementation of the plan. It is up to the individual agri-enterprises to make the decision as to whether they will apply for the Viability Gap for Enterprises Grants. The other driver for the value chain planning development is the provision of business, marketing and technical production support for the sector members by HortLangSon, initially delivered by the Service Provider.

380. Star anise agri-enterprise will be made aware of the Viability Gap Grants for Enterprises (Competitive grants) through the awareness program (Activity 3.1.9) and through Product Group activities (3.1.5). Output 3 encourages the wide use of Competitive grants and it is important to highlight that Viability Gap grants are not just for the bigger agri-enterprises. The PPTA design identified that there are a number of small district based star anise traders and processors that have the potential for growth and development. Output 3 will also encourage the development of small commune based star anise businesses, especially businesses that are managed by women. Commune members do not need to be members of the Producer Groups to be eligible for business development support. But they will need to be members of the star anise Product group.

Table 69: Output 3.2.2 Tasks and Responsible Expert

| Activity 3.2.2 Implementation of Star Anise Value Chain development plan: Agri-Enterprises | | |
|---|---------------------------|--------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Continue awareness | Service Provider- led by | Project month 11 onwards |

| | | |
|--|---|--|
| program for star anise sector members (activity 3.1.9) | Team Leader and Information Systems and Outreach expert | |
| 2. Promote Competitive grant program (Activities 3.1.4, 3.1.9 above) to star anise Product Group members | Service Provider with PMU- Information Systems and Outreach expert and Financing and Grant Management Expert | Project month 13 onwards |
| 3. Assistance individual agri-enterprises with the viability gap grant applications | Service Provider with PMU- Financing and Grant Management Expert | Project month 14 to 16 |
| 4. Business plan preparation assistance- for individual agri-enterprises | Service Provider with PMU- Financing and Grant Management Expert, and Agricultural Producer Groups and Market Linkages expert | Project month 14 to 16 |
| First round of Viability Gap Grants deadline is Project Month 17 | | |
| Regular monitoring of value chain members that have been awarded grants and providing assistance as required | Service Provider- Team Leader to coordinate experts and field staff | From project month 18 onwards (after grants awarded) |

3. Output: 3.2.3 Star Anise Producer Group Value Chain Development

381. The star anise development and action plan implementation linked to the star anise producer groups is outlined in this sub section. Farmer membership of the star anise Product group provides the basis for building the business relationship between the Producer Groups, the agri-enterprise and other star anise value chain members: traders, retailers etc.

382. It is proposed that star anise producer groups formed in Year 1 will be based upon the SNV Spice of Life groups in Yen Phuc and Binh Phuc communes in Van Quan district. During inception, the Service Provider will assess the potential participation of Yen Phuc and Binh Phuc groups. The leaders from the Van Quan producer groups (once confirmed by the Service Provider at Inception) will participate in the preparation of the star anise sector development plan.

383. To be eligible for project support the producer groups must have a business relationship that is consistent with the Product Group's development plan. It is a condition of the project that the producer groups must have an established market relationship with star anise processor or marketer. If the producer group does not have an existing established relationship, then a formal supply agreement must be formalised. The star anise sector development will consider the issues that affect the viability of the Lang Son industry and propose actions that will strengthen business relationship between the producers, traders, processors and marketers. Developing and strengthening the business relationships between the producer groups and Viet Nam agri-enterprises is a critical part of the Lang Son horticultural sector development strategy.

384. Although it is the existing Producer Groups that will be assisted first consideration will be

given to other star anise farmers joining the groups. This will need to be considered by the Commune People's Committee in each commune, HortLangSon and the PMU. The Service Provider will assess the question of Producer Group membership at inception and, if required, develop a suitable mechanism for any new group members to join existing groups and be eligible for grant funds.

385. Assistance through the Producer Group grants (block grants) is the driver for the producer group development. Groups will apply for a grant and this will involve the preparation of a business plan for each producer group. An outline of the business plan requirements is shown on Section VI, and will be aligned with the overall star anise development plan. Each business plan must include marketing plan that will define the group's market relationship with the Lang Son based star anise business. Preparation of the business plan for each Producer Group will supported by the Service Provider Agricultural Producer Groups and Market Linkages expert.

Table 70: Output 3.2.3 Tasks and Responsible Expert

| Activity 3.2.3 Star Anise Producer Group Value Chain | | |
|--|--|--------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Continue awareness program for star anise sector members (Activity 3.1.9) – targeted at producers | Service Provider- led by Team Leader and Information Systems and Outreach expert | Project month 11 onwards |
| 2. Producer group formation (based on the SNV project groups) | Service Provider –led by Agricultural Producer Groups and Market Linkages expert | Project month 13-15 |
| 3. Group business plan prepared and application for Producer Group grant | Service Provider –led by Agricultural Producer Groups and Market Linkages expert | Project month 14-16 |
| First Producer Group Grant deadline is Project Month 17 | | |
| Group implementation of business plan and investments assisted, training etc. | Service Provider –led by Agricultural Producer Groups and Market Linkages expert, extensions services etc. | Project month 18 Onwards |

4. Output 3.2.4: Value Chain Agri-Enterprises and Producer Groups assisted

386. HortLangSon, initially through the Service Provider, will have a program of regular assistance to the agri-enterprises that have received grants, and also to the Producer Groups. Performance of the agri-enterprises and the Producer Groups will be monitored against the action and the business plans. This will be achieved through the quarterly reports and a program of regular field visits. Support will be provided on a regular and proactive basis.

387. Regular meetings of the provincial and district star anise Product Group committees will be held that will provide feedback on the star anise development plan and action plan performance. The meetings will also provide the opportunity for members to raise issues.

388. Once the core HortLangSon services are developed all members of the Star Anise Product

Group will be eligible for a wider range of assistance. This includes agri-enterprises that have not received Output 3 grants – the only requirement being that they must be a Product Group member. Core service such as market and trade information, post-harvest requirements and quality information will be made available to all Product Group members.

Table 71: Output 3.2.4 Tasks and Responsible Expert

| Activity 3.2.4 Value Chain Agri-Enterprises and Producer Groups assisted | | |
|---|--|-------------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Regular Product group meetings assisted | Service Provider-Team Leader to coordinate | From project month 11 onwards |
| 2. Monitoring of star anise development and action plan implementation performance | Service Provider-Team Leader to coordinate | From project month 14 onwards |
| 3. Monitor performance of agri-enterprises and producer groups using reports and field visits | Service Provider-Team Leader to coordinate | From project month 19/2019 |
| 4. Specific support provided to agri-enterprise and producer groups | Service Provider-Team Leader to coordinate | From October 2019 |

D. Output 3.3 Safe Vegetable Value Chain Development

389. The PPTA proposal for safe vegetable value chain development needs to be confirmed by the HSSP and associated market assessment before it proceeds. The market assessment must confirm that there are sound market prospects for safe vegetable and that it is feasible to develop these with the assistance from the project. It is expected that the HSSP will confirm the PPTA proposal. But if the proposal to develop the safe vegetable value chain is considered not a viable option then the Service Provider, HortLangSon board and the PMU will need to decide the replacement product value chain that will be developed.

390. One of the Service Provider Inception tasks will be to identify and confirm the safe vegetable farmers that will form the safe vegetable producer groups. The most commercial vegetable farmers operate around the Lang Son city area and it is these farmers who may provide the best opportunity to initiate the development of a scalable safe vegetable sector in Lang Son. The Lang Son city safe vegetable farmers have quite well established market linkages but they lack the production volume to develop regular market connections with Hanoi retailers.

391. All the Output 3 investments will be undertaken under the various Output 3.1 activities. The direct investments that support the safe vegetable value chain development are 3.1.6 Competitive Grants (see above in Section III A). The safe vegetable value chain development may involve only a limited number of agri-enterprises and most of the investment and support activities will be for the safe vegetables Producer Groups and their connection with safe vegetable retailers. Involving the safe vegetable retailers in the safe vegetable value chain development and Safe Vegetable Product Group is essential.

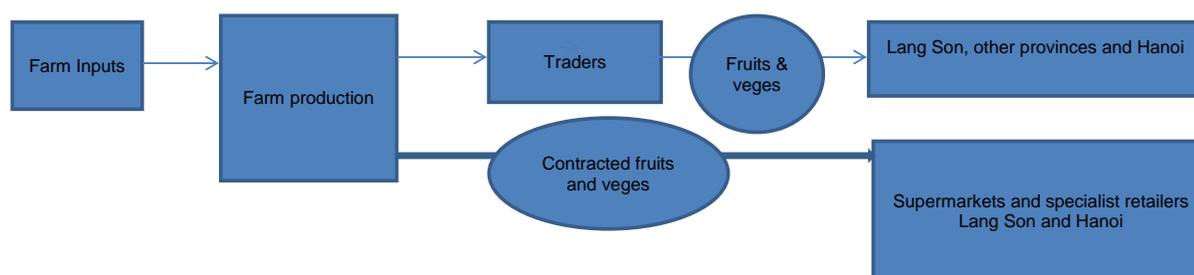
392. Preparation of the safe vegetables development plan will be built upon the horticultural sector strategic plan, and address the issues that are identified by the Safe Vegetables Product Group members. There must be wide consultation with all the value chain members that are

shown in Figure 9. The Safe Vegetables Action Plan will define the main actions that will be undertaken. Many of the actions will be connected to the Output 3 activities, but there are some actions that the Safe Vegetables Product Group may initiate and lead themselves e.g. raising policy issues with provincial departments, or with districts. One of the roles of the HortLangSon Service Provider is to empower the Product group to take increasing responsibility for dealing with star anise industry issues. The Safe Vegetables Sector Development Plan and the associated action plan will be endorsed by the HortLangSon board.

393. Safe vegetable value chain development involves several activities and there are a number of different agencies involved. Figure 9 below presents the main stages in the safe vegetable value chain and shows:

- (i) The main services that HortLangSon will provide to the value chain members;
- (ii) Output 3 Investment activities for each value chain stage, and;
- (iii) The agencies responsible for the main project tasks for each value chain stage.

Figure 16: Safe Vegetable Value Chain showing Project Services and Investment



| HortLangSon Services | | |
|---|---|---|
| Safe Vegetable strategic and market plan; Form Safe Vegetable Product Group; Trade, market and quality assurance information; Operational quality assurance systems: standards, traceability; Outreach program – awareness, information, education for Product Group members; Vegetable data gathering and management use | | |
| Assist to prepare farmer group business plan & Technical and marketing production advice | Assist businesses to prepare grant application & provide business, marketing and technical advice | Assist businesses to prepare grant application & provide business, marketing and technical advice support; Assist small businesses (traders) to prepare marketing grant applications & marketing advice and support |
| Output 3 Investment Activities | | |
| Block Grant –Fund inputs for farmer groups: Feeder roads; shade houses, irrigation and water tanks, seed & fertilizer etc.; group registration; technical advice | Business grants (small) | Business grants Innovation grants Marketing grants |
| Responsible Agency for Implementation Support | | |

| | | |
|----------------------------------|--------------------------------------|-------------------------------------|
| HLS, District, CPC, farmer group | HLS – & other departments, districts | HLS -& other departments, districts |
|----------------------------------|--------------------------------------|-------------------------------------|

1. Prepare Sector Development Plan for Safe Vegetable Value Chain Development

394. Safe Vegetable value chain development planning will be through the Safe Vegetable Product Group formed under Activity 3.1.5. Preparation of the safe vegetables development plan will be built upon the horticultural sector strategic plan and involve dialogue with the safe vegetable sector members that include farmers, and any agri-enterprises involved with safe vegetable value adding activities with an input by provincial departments and any service providers. The formation of the safe vegetables Product group may take some time as there is no formal vegetable sector structure and organization established yet in Lang Son. The Lang Son vegetable sector is dominated by a high number of small vegetable producers spread over a number of districts. The DOIT has an active involvement with some safe vegetable groups and their marketing activities and will be a key partner in developing the Product Group and some of the safe vegetable Producer Groups.

395. The safe vegetables product action plan will define the main actions that will be undertaken. Many of the actions will be connected to the Output 3 activities, but there some actions that the Product Group may initiate and lead themselves e.g. raising policy issues with provincial departments, or with districts. One of the roles of the Service Provider and HortLangSon is to empower the Product Group to take increasing responsibility for dealing with safe vegetable issues. The safe vegetables sector development plan and the associated action plan will be endorsed by the HortLangSon board.

396. Women undertake a high proportion of the vegetable production and marketing tasks. Consequently, the awareness program and the following sector consultations must ensure that women vegetable farmers are fully and actively involved. Communications with the women vegetable farmers during consultants also needs to ensure that ethnic languages are used and literacy constraints are taken into consideration.

Table 72: Output 3.3.1 Tasks and Responsible Expert

| Activity 3.3.1 Safe Vegetable Value Chain Development Plan | | |
|--|--|--------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Awareness program for safe vegetable sector Product Group members (Activity 3.1.9) | Service Provider- led by Team Leader and Information Systems and Outreach expert | Project months 13 to 15 |
| 2. Consult with safe vegetable sector members and prepare safe vegetable sector development plan | Service Provider –led Team Leader, Information Systems and Outreach expert | Project months 15 and 16 |
| 3. Prepare an Action Plan that features the Output 3 support for sector development: | Service Provider –led by Team Leader | By project month 16 2019 |

2. Activity 3.3.2. Implement the Safe Vegetables Value Chain Development Plan

397. The Service Provider will be responsible for the implementation of the safe vegetables value chain development plan, based upon an action plan. The Competitive grant program will be a main driver for the implementation of the plan, Safe vegetable Producer Groups will utilise the producer group grants (block grants), and there may also be some agri-enterprises that will seek to apply for viability gap grants. Value adding in the safe vegetable value chain is encouraged and this includes commune level services by small entrepreneurs. The other driver for the safe vegetables value chain plan development is the provision of business, marketing and technical support for the sector members by HortLangSon.

398. Safe vegetable retailers are important safe vegetable value chain members, as are the traders involved in purchasing and transport of safe vegetable to markets. Formation of the safe vegetables Product Group, and the subsequent preparation of the safe vegetable development plan, must involve all members of the value chain, including the safe vegetable retailers. Many of the safe vegetable retailers will be based in Hanoi, and some suitable mechanism will be needed to get them engaged in the Product Group.

399. Safe vegetable sector members will be made aware of the Competitive grants through the awareness program (Activity 3.1.9) and through Product Group activities (3.1.5). Output 3 encourages the use of Competitive grants at different stages in the value chain. This includes the development of small district and commune based safe vegetable value adding businesses, especially businesses that are managed by women. In the commune meetings to promote awareness of the safe vegetable value chain development the opportunity for project support for small businesses associated with value adding for safe vegetables must be featured.

Table 73: Output 3.3.2 Tasks and Responsible Expert

| Activity 3.3.2 Implementation of Safe Vegetable Value Chain Development Plan | | |
|--|--|---------------------------------|
| Main Tasks | Responsible Agency | Timing |
| Continue awareness program for safe vegetables Product Group members (Activity 3.1.8) | Service Provider- led by Team Leader and Information Systems and Outreach expert | From project month 11 |
| Promote Competitive grant program (Activities 3.1.4, and 3.1.8 above) for viability gap grants and producer groups | Service Provider - Information Systems and Outreach expert and Financing and Grant Management Expert | Project month 15 and 16 onwards |
| Business plan preparation assistance – basis for viability gap grant application by agr-enterprises | Service Provider - Financing and Grant Management Expert | Project month 15 and 16 |
| Assistance with grant applications | Service Provider - Financing and Grant Management Expert | Project month 16 |
| Safe Vegetable Viability Gap Grant Applications due by 30 project month 19 | | |
| Group implementation of business plan and investments | Service Provider- Team Leader to coordinate | Project month 20 onwards |

| | | |
|-------------------------|--|--|
| assisted, training etc. | | |
|-------------------------|--|--|

3. Activity 3.3.3 Safe Vegetable Producer Group Value Chain Development

400. Preparation of the producer group business plan, that includes marketing plan, will be informed by the safe vegetables sector development plan. The producer group business plan will be assisted by the HortLangSon Service Provider experts and their field staff. Market linkages with safe vegetable retailers will be one of the challenges for the viable development of the producer groups. A marketing agreement between the producer group and one or more safe vegetable retailers is required as prior condition for producer group grant approval.

Table 74: Output 3.3.3 Tasks and Responsible Expert

| Activity 3.3.3 Safe Vegetable Farmer Group Formation and Operations | | |
|---|--|--------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Continue awareness program for safe vegetables Product sector members (Activity 3.1.8) – targeted at producers | Service Provider –led by Agricultural Producer Groups and Market Linkages expert with Commune Coordination Group | From project month 11 |
| 2. Producer group formation –location confirmed by the Inception Mission | Service Provider –led by Agricultural Producer Groups and Market Linkages expert | Project months 15 and 16 |
| 3. Group business plan prepared and application for Producer Group grant | Service Provider –led by Agricultural Producer Groups and Market Linkages expert | Project month 16 |
| First Producer Group Grant deadline is 30 of project month 18 | | |
| 1. Group implementation of business plan and investments assisted, training etc | Service Provider – various HortLangSon technical specialists and district and commune extension services | Project month 19 onwards |

4. Output 3.3.4-Value Chain Agri-Enterprises and Producer Groups assisted

401. HortLangSon will have a program of regular assistance to the Producer Groups and any safe vegetable agri-enterprises. This included any small businesses that have been awarded grants. The PPTA has observed that the Tu Xuyen commune farmers have limited commercial safe vegetable production and marketing experience and will require a high level of support over the first two years. Performance of the safe vegetable Producer Groups will be closely monitored through a program of field visits and the groups' quarterly reports. HortLangSon will have field staff based in the districts that will work with the groups as well as the District Extension Station and Commune Extension Workers.

402. Regular meetings of the provincial and district safe vegetables Product Group committees will be held that will provide feedback on the safe vegetables development plan and action plan performance. The meetings will also provide the opportunity for members to raise issues.

403. Once the core HortLangSon services are developed all members of the safe vegetables Product Group will be eligible for assistance. This includes safe vegetable production groups that have not received Output 3 grants. Core service such as market and trade information, post-harvest requirements and quality information will be made available to all safe vegetable Product Group members (must be Product Group members). Some of the existing safe vegetable Product Groups may only need assistance with marketing connections, and post-harvest management.

Table 75: Output 3.2.4 Tasks and Responsible Expert

| Activity 3.2.4 Value Chain Agri-Enterprises and Producer Groups assisted | | |
|---|--|-------------------------------|
| Main Tasks | Responsible Agency | Timing |
| 1. Regular Product group meetings assisted | Service Provider-Team Leader to coordinate | From project month 11 onwards |
| 2. Monitoring of safe vegetables development and action plan implementation performance | Service Provider-Team Leader to coordinate | From project month 18 |
| 3. Monitor performance of agri-enterprises and producer groups using reports and field visits | Service Provider-Team Leader to coordinate | From project month 19 |
| 4. Specific support provided to agri-enterprise and producer groups | Service Provider-Team Leader to coordinate | From project month 19 |

E. Other Product Value Chain Development

404. Development of other Product value chains will commence during Year 4 of the project. The horticulture sector strategic plan will identify the potential commodities that will be developed in Year 4 and this will be confirmed at the mid-term review.

405. As the project evolves HortLangSon will develop its core functions and provide a range of support to members of all the Product Groups. It is highlighted that over the first two to three years of the project that HortLangSon will not just assist the star anise and safe vegetables product value chains members. Widening and deepening the HortLangSon assistance to the horticultural sector, through the Product Group structure, is a main Output 3 objective. Value chain members must be members of Product Groups to be eligible for direct project assistance. This sector assistance will commence once HortLangSon becomes established, and its core function services become operational.

V. Product Groups and Producer Groups

406. Section V Product Groups and Producer Groups is aimed at the staff in the provincial and district agencies, units and departments and the communes that will be involved in the formation and support of these two types of groups:

- (i) HortLangSon Service Provider;
- (ii) Commune Peoples' Committee;

- (iii) Product Group leaders and members;
- (iv) Farm Producer Group leaders and members.

A. Contents of this section

407. Chapter V describes the main implementation and operational tasks associated with:

- (i) Product Groups;
- (ii) Producer Groups.

B. Product Groups

408. Background: Product Groups will be formed to represent the producers and agri-enterprises associated with each of the main commodities in the horticultural sector. The Product Groups have an important role in Output 3 and the horticultural sector development. The group will be inclusive of all product sector members: producers, processors, traders, service providers and retailers, with a particular emphasis upon women members.

409. Each Product group will be the platform and framework for the development of their product sector. Once the horticultural sector strategy is completed the main Product Groups will be assisted by the HortLangSon Service Provider to prepare their Product development plans. Star anise will be the first to prepare their Product Group development, and safe vegetables will be the second. It is proposed that there will be three more Product groups formed with project support and these will be determined during the horticultural sector strategic planning exercise. The Service Provider Inception Mission will assess the number of Product Groups to be formed. Formation of more Product Groups will be considered at mid-term.

410. The role of the Product Group is to provide the forum for the group members to meet and work together to develop a collective approach (for all Product value chain members) to the development of their product sector. The Product Group will provide the platform for members to work together on the development of coordinated approaches to Product business and marketing, and other issues that impact upon their Product. Only Product Group members will be eligible for assistance from the project.

411. Preparation of the product sector development plan will form the basis for cooperative efforts by the Product group members. Sector development plan preparation will be informed by the horticultural sector strategic plan but will address issues directly related to the Product. The Sector development plan will enable the members to better identify business opportunities and how to access project support in a coordinated manner to capitalise upon these opportunities. The sector agri-enterprises and producer group business plans will reflect these opportunities and form the basis for the competitive grant applications by the Product Group members.

412. Each Product group will be aligned with HortLangSon through a Memorandum of Understanding, and be assisted by the HortLangSon Secretariat. Through HortLangSon the Product Groups can raise issues with departments and also PPC. They will also be able to access the range of service provided by HortLangSon. Horticultural sector members must be a member of a Product Group to be eligible for direct support from the project.

413. Formation of the Product Groups will be through the following process:

- (i) Awareness program – the HortLangSon Service Provider will promote awareness

- about the Product Groups and their role during the inception phase and preparation of the horticultural sector strategic plan;
- (ii) District level awareness meetings will be conducted. These will be community based and located in communes that are the dominant producers of the product. The HortLangSon Service Provider will facilitate these meetings in partnership with the district agencies;
 - (iii) After the awareness program there will be a second round of district meetings that will elect up to ten (10) Product group representatives for each district. Each district will be represented in proportion to their level of production of the Product – HortLangSon will set these levels for each district;
 - (iv) Criteria will be set by HortLangSon for the election of the Product Group representatives from each district. There must be a balance of farmer producers, traders and collectors, and agri-enterprises (processors and marketers);
 - (v) District representatives will elect a provincial product committee that will be responsible for the Product Group functions. The committee will consist of up to 12 members that are representative of the Product sector structure. Note: It is an Output 3 requirement that at least 50% of the Product Group representatives are women at both district and provincial levels. An initial GAP target is for 10% of the provincial Product group leadership to be women. It is also an Output 3 requirement that the farmers are represented by bona fide farmers (elected by groups of farmers) and not by members of the Farmer's Union and Women's Union;
 - (vi) HortLangSon will prepare guidelines for the membership of each product committee and its terms of reference;
 - (vii) HortLangSon will act as the secretariat for each Product Group;
 - (viii) Once each Product Group is formed it will become a registered member of the Lang Son Business Association;
 - (ix) The PMU, in consultation with the PPC, will appoint up to three (3) government staff as ex-officio provincial committee members for each Product Group. These staff will be from DOIT, DARD and DOST respectively, and their roles will be advisory only. The Product Groups have been formed to give the product sector members a greater role in their sector and encourage their empowerment. Thus, the department role must be one of guidance and advice.

414. Once the provincial Product committee is selected HortLangSon will commence to assist the Product Group to develop its vision and sector development plan and the associated Product group action plan. The sector development plan will define the outcomes and targets that Product Group wants to achieve, and how these are to be achieved. Preparation of the sector development plan will involve district level consultation with the district Product Group representatives. The Product sector plan must be approved by the HortLangSon board. It will also be shared with the departments, districts and other sector stakeholders and displayed on the HortLangSon website.

415. Financial: Formation and operations of the Product groups will be through HortLangSon. The business plan will present the case for annual funding and the HortLangSon board will approve this annually up to a limit of \$10,000 per annum. The primary use of the grants funds is to assist the Product Group to facilitate activities that enable them to respond to issues impacting upon their Product sector and to take collective action. Conditions of the grant state that grant funds:

- (i) must only be used for group operational activities – meetings, workshops and associated consumables etc.;
- (ii) cannot not be used for wages or salaries for group committee members, or for

business development and marketing activities. HortLangSon will provide secretarial services and any business and marketing activities will be funded through the agri-enterprises, marketing and Producer Group grants.

416. HortLangSon will assist the Product Group to form an executive committee and to get it operational. It is an Output 3 condition that at least 50% of the executive committee members must be women.

417. Product Groups will submit quarterly reports via HortLangSon board. Continuation of the annual group budget and workplan will be subject to the following:

- (i) Achieving the performance outputs and targets in the business plan;
- (ii) Providing timely quarterly reports that include accurate financial records;
- (iii) Annual workplan and budget provided to HortLangSon board by 30 October each year.

418. The first business plan will include the plan for the utilization of the up to \$10,000 funding for the first year of the Product group operations. The HortLangSon board will review the first annual plan and approval will be based upon the recommendation of the Service Provider;

- (i) The Product Group will subsequently prepare an annual plan for each year (due by 30 October of the year prior to the budget year) of the project that presents their annual operational plan (outputs and activities) and the utilization of the product grant funds;
- (ii) Approval of each annual plan of up to \$10,000 budget will be by the HortLangSon board.

419. Reporting: Quarterly reports will be provided to the HortLangSon board that presents progress against outputs and activities in the annual plan, any issues arising, and features. The report will append minutes of all meetings, and will also include a financial statement showing utilization of the grant.

C. Producer Groups

1. Background

420. Producer Groups will be formed as part of the Output 3 business development model, and will be members of the Product Groups described above. It is expected that the Producer Groups will evolve into profitable, self-reliant and resilient commercial groups of farmers groups over the life of the project, and will continue as commercial production groups after the project is completed. Group membership will provide the opportunity for farmers with small land areas and low volume of produce to be connected with modern value chains that supply high value markets. Through the Producer Group business model the farmers are able to develop stronger market relationships, produce better quality products and increase their product prices. Their business relationships will be strengthened through the member of the Product Group. The group mechanism also increases the efficiency of the delivery of project services to the farmer group members.

421. The main implementation tasks associated with the Producer Groups and the agencies responsible for these tasks are presented in the table below.

Table 76: Producer Group Formation Tasks and Responsibilities

| Tasks | Responsible |
|------------------------------------|--|
| 1. Group formation | Commune People's Committee, with assistance from HortLangSon |
| 2. Group operational guidelines | HortLangSon Service Provider to facilitate |
| 3. Group business plan preparation | HortLangSon Service Provider assist the groups |
| 4. Group training | HortLangSon Service Provider, departments and district agencies |
| 5. Implementation support | HortLangSon Service Provider, with input by Commune Coordination Group and District Coordination Committee |

2. Group formation

422. Producer Groups will consist of new groups, as well as groups that have been formed under other projects. Regardless of whether new groups will be formed or existing groups will be included the following procedures must be followed.

423. All commune members made aware of the Project's Output 3 activities, what Output 3 involves and the reasons for the formation of the Producer Groups.

424. Groups will be either new groups or existing groups. In the first three years there will be only safe vegetables and star anise groups formed. Safe vegetable groups will be either new or existing groups, and the first star anise groups will be formed based upon the existing groups from the SNV Spice of Life project. This will, however, be confirmed during Inception.

425. Where new groups are to be formed commune members will express their interest in being a group member. The decision on group membership will be made by the Commune Peoples' Committee with guidance from HortLangSon Service Provider. For the new vegetable groups that are formed:

- (i) At least 50% of the members must be women;
- (ii) A woman must be either the leader or deputy leader of the group;
- (iii) The members must have previous vegetable production experience;
- (iv) Group members will be required to be members of the safe vegetables Product group;
- (v) Their land areas must be contiguous, and;
- (vi) Members must formally commit to the group regulations.

426. For existing groups the members will be given the opportunity to decide if they wish to participate in Output 3.

427. The groups to be eligible for Output 3 support must be aligned to HortLangSon through membership of their respective Product Groups.

3. Group regulations

428. Producer Group regulations will be mix of core Output 3 regulations and regulations that

the Producer Group members propose and agree upon. Producer Group formation will be managed by the Commune Coordination Group (see Section III C Communes) and overseen by HortLangSon. The core Output 3 regulations are:

- (i) Be a formal business entity either collaborative group (commune registered) or a registered cooperative;
- (ii) Group members all agree upon their business and marketing plan and have at least one supply agreement with a processor or retailer for supply of product (it is not required to have a formal contract);
- (iii) Management of the group's assets, funds and equipment including the assets provided by the project;
- (iv) Compliance with the project's regulations over financial management, financial reporting and procurement;
- (v) The group must have a bank account that is verified by Commune Peoples' Committee, and bank account records are included in group's quarterly reports;
- (vi) At least 50% of the group's members must be women, and a woman must be the leader or deputy leader of the group.

429. Financial management includes how the group will manage working capital on either a group or individual member basis. The group regulation document is an official, signed contract between group members. It includes agreement for:

- (i) Purpose of the group and group composition – this must commit to working as a business group;
- (ii) Principles for group operations including production, management, marketing and accounting;
- (iii) Management and ownership of group property including cash and equipment, and;
- (iv) Rights and responsibilities of group members, group leaders and group secretaries.

4. Note:

430. It is not a project requirement that each Producer Group becomes a registered cooperative. The size of the groups will vary and for some of the smaller groups there will be no financial, marketing and operational advantages for them to become a registered cooperative. Producer Groups, however, must be a registered legal entity to be eligible for block grant assistance. Registration may be with the Commune Peoples' Committee as a collaborative group (To Hop Tac).

5. Functional business group.

431. It is common in Viet Nam for farmer groups to be formed so that the members can access resources and that subsequently the group does not develop into a functional business operation. The group's business plan is to provide the basis for the group business operations and must be followed. If the Producer Group does not function as a business group after it is established it will not be eligible for further project support and will be required to return assets provided through the project.

VI. Competitive Grants

432. Section VI Competitive Grants is an important section aimed at the staff in the provincial and district agencies, units and departments and the communes that will be involved in the competitive grant program implementation including:

- (i) PMU;
- (ii) HortLangSon Service Provider;
- (iii) Product Groups – especially agri-enterprises;
- (iv) Commune Peoples Committee;
- (v) Producer Group leaders and members.

A. Contents of this Section

433. Chapter VI describes the main conditions and implementation tasks associated with:

- (i) Viability Gap Grants for Enterprises (includes marketing and innovation grants);
- (ii) Producer Group grants.

B. Background:

434. Modernization of the Lang Son horticultural sector is constrained by the limited access that sector agri-enterprises and farmers have to funds to invest in the development of their businesses. The purpose of the Competitive Grant program is to assist agri-enterprises and farmer groups with their access to investment funds and thus address the viability gaps that they face. Competitive grants will be available for enterprise modernization, for small scale post-harvest enterprises to establish basic infrastructure and systems for aggregation, first step processing and quality assurance. Market development grants will also be available for agri-enterprises, as will grants for innovations. Producer Groups will also be assisted through block grants to build horizontal coordination in the sub-sector and that connects the groups with modern value chains.

435. Product groups formed for the main horticultural commodities and will provide the framework for connecting the members within each Product group and developing coordinated value chain business activities. Each Product group will prepare their own sector development plan that will involve all sector members. Through the use of funds from the Competitive grants, and the input of their own funds, the agri-enterprises and producer groups will invest to develop the quality of their products to export to high quality markets. Modern value chains will be developed that will features high connectivity between producer, traders, processing, retailers and other chain members.

436. The two categories of competitive grants are summarised in Table 77 below.

Table 77: Competitive Grant Categories and Objectives

| Competitive Grant Categories | | Objective |
|------------------------------|--|--|
| 1. | Viability Gap Grants for Enterprises | |
| 1.1 | Strategic Multi-Product or Sector level grants | To encourage investment in multiuse facilities by providing processing, packaging and storage for a range of horticultural products. Multiple use of facilities achieves |

| Competitive Grant Categories | | Objective |
|-------------------------------------|--|---|
| | | greater cost efficiency, and also extend the season for marketing of products. |
| 1.2 | Agri-Enterprise Viability Gap Grants | Targeted at the larger Lang Son agri-enterprises so they can modernise their product transformation and enhancement. Market development, and innovations are also features. |
| 1.3 | Small Agri-Enterprise Viability Gap Grants | Targeted at the smaller district based agri-enterprises to assist with modernisation of their value adding equipment and quality assurance systems, and market development |
| 2. | Producer Groups | |
| 2.1 | Block Grants | Assist Producer Groups to invest in a modern production base for their products that will enable them connect with processors and retailers and also to connect to high value markets |

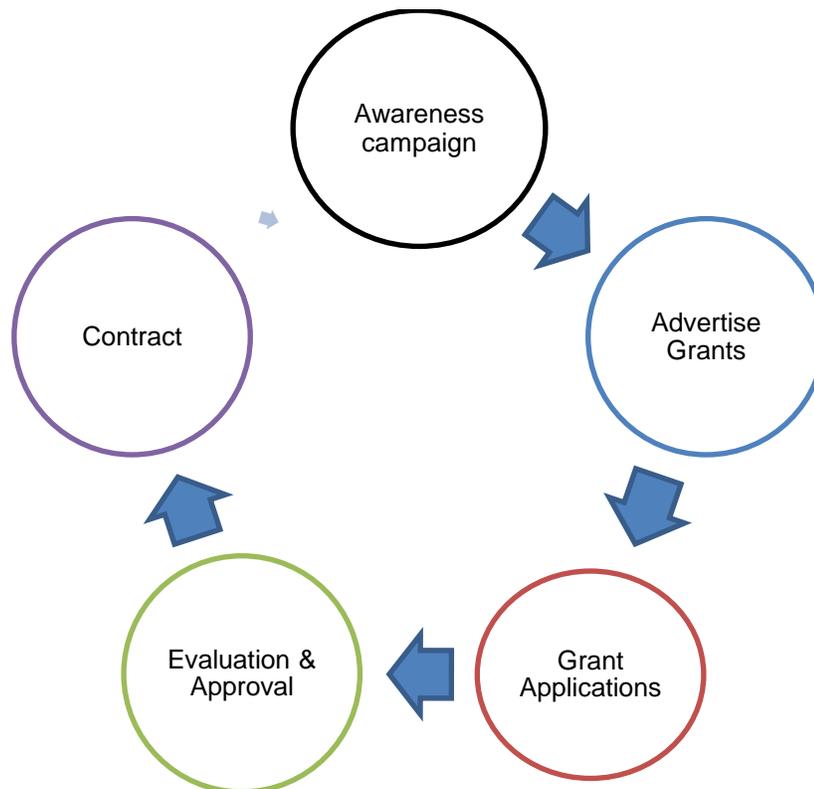
C. Viability Gap Grant Implementation

437. The HortLangSon Service Provider will be responsible to the PMU for the implementation of all the Competitive Grants stages – see Figure 17. This will involve the following tasks:

- (i) Finalise the regulations for each of the separate grant programs based upon the Grant Eligibility Criteria (Appendix 2 of this Manual) and have these approved by the PMU and the ADB;
- (ii) Prepare the documents for grant applications – these will be informed by the experience of the IFAD grants schemes in neighboring provinces of Bac Kan, Ha Giang and Cao Bang. This includes the evaluation criteria for each of the grants;
- (iii) Prepare a plan and timetable for the implementation of the grants. The Service Provider will advertise enterprise grant availability, conditions and terms, along with scope of interest each year from project years 2 through 4. Some grants may be awarded after year 4 depending upon implementation and disbursement progress. Applications will be made once per annum, unless otherwise agreed by the Board of Directors for HortLang Son, the PMU and ADB – this agreement must be sought prior to any change;
- (iv) Organise an ongoing awareness program for horticultural sector members about the grant schemes. The awareness program must ensure that the target sector members are informed of the grant schemes, ensure they know that this is a competitive grant scheme and what the criteria are. This includes women farmers and women owners of small to medium sized agri-enterprises;
- (v) The awareness program must also ensure that the producer groups know and understand that the producer group grants are for the development of the producer group's farming business. The producer group must commit to becoming a farm production business that has a formal business relationship with traders and retailers;
- (vi) Provide a program of support for grant applicants to prepare their business and marketing plans (see below for more information);
- (vii) Form and train the members of the proposed evaluation task force, finalise

- evaluation criteria and scoring systems, provide a timeline and performance standards for evaluations;
- (viii) Coordinate the evaluation of the grant applications. HortLangSon will complete Due Diligence of the agri-enterprises associated with each application. The due diligence reports for the Multi Product sector level grants and agri-enterprise viability grants must be reviewed by the HortLangSon board and given no objection by the PPC. For the other grants the PMU will be responsible for no objection based upon the due diligence report assessment;
 - (ix) Notify the successful applicants and commence a program to support with their business development investment activities. Where any application is not approved HortLangSon will discuss with the applicants the reasons why the application was not approved. Assistance may be provided to assist to revise the application for resubmission – this will be based upon the recommendations of the HortLangSon board and PMU;
 - (x) Monitor business and market plan implementation and provide support and advice as required.

Figure 17: Main Steps in the Viability Gap and Producer Group Grant Process



438. Formulation of the evaluation criteria will take into consideration several factors:

- (i) For the Viability Gap Grants for Multi Commodities and Agri-Enterprises the PPC wishes to encourage investment from business partners outside of Lang Son province – this can include overseas investors. Where local agri-enterprises can demonstrate that they have an outside investor(s) this will strengthen their business case;

- (ii) Small district based agri-enterprises managed by women will be encouraged – this is consistent with the project’s inclusivity theme;
- (iii) Contributions in cash and kind from Producer Groups will also be taken into consideration in the approval of the block grants.

D. Viability Gap Grants for Enterprises

439. Viability Gap Grants for Enterprises consist of two main categories. The first category is Strategic Multi-Product or Sector level grant that are aimed at agri-enterprise investment in multi-use facilities to service the horticultural sector. Lang Son’s horticultural sector has several products that all have short seasons e.g. custard apples and litchi. There are no packhouses and cool stores for these products that can extend the marketing season and enable sorting and packing for higher value markets. The aim of the Strategic Multi-Product or Sector level grant is to encourage investment in multi-use facilities.

440. Viability Gap Grants for Enterprises is the second category and these grants are aimed at assisting agri-businesses that want to invest in the development of their businesses. There are three main gaps “areas” that the Viability Gap Grants for Enterprises will address: (i) investment in facilities and equipment for processing and drying; (ii) market development, and; (iii) innovations to enhance product quality and development new products.

441. Facilities and Equipment: investment in facilities and processing equipment that will assist to overcome the major constraints that limit connectivity with higher value markets. Better facilities and processing equipment will lead to better product processing, increased value adding, introduce and apply quality assurance and post-harvest technologies. These are all required to develop modern value chains and connect with high value markets.

442. Marketing and market development: to assist the agri-enterprises develop export markets for their products. The marketing grants will enable the agri-enterprises to initiate a two - year market develop program where they can market their products at international fairs and to retailers and consumers in export markets. Market development grants are not exclusively for overseas markets and may also be used to develop high vale markets within Viet Nam.

443. Combined and coordinated marketing featuring Lang Sons unique characteristics is one of the concepts that underpins the formation of HortLangSon. All the Lang Son agri-enterprise are small as compared to their international competitors and HortLangSon will lead a coordinated approach through the Product Groups to the marketing of Lang Son’s horticultural produce. HortLangSon will encourage and assist the Product Group enterprises to prepare joint applications for market development activities. This will also involve DOIT as the project evolves. Coordination between the DOIT and the Output 3 market development support for the horticultural sector is critical to ensure synergies and efficient use of funds.

444. Applied innovation development: Encouraging innovation in the horticultural sector value chains is considered to be important for sector development. Therefore, the Viability Gap Grants for Enterprises will include innovation. The aim of the innovation component is to encourage the agri-enterprises to contract research to develop new products, and enhance their processing (value adding) capacity.

1. Note:

- (i) Innovation funding is included as part of the Viability Gap Grants for Enterprises

- (ii) State-owned-enterprises, and government research institutes may be contracted for innovation research if they are legally and financially autonomous, operate under commercial law, and are not dependent agencies of the borrower or sub-borrower.

Table 78: Summary of Viability Gap Grants for Enterprises Conditions

| Grant Purpose and Conditions | Grant Fund limits |
|---|---|
| Strategic Multi-Product or Sector level | |
| <p>Purpose: to encourage investment in multi-use facilities that provide processing, packaging and storage services to a number of horticultural enterprises over the whole year (multi-purpose pack house model).</p> <p>Conditions:</p> <p>(i) Investor to provide at least 51% of the total planned investment;</p> <p>(ii) Viable business plan that includes: (a) five (5) year financial projections that confirm the financial viability of the proposed investment and demonstrates the investment propositions contribution to the increased profitability of the business; (b) all sources of finance for the proposed investment, including evidence of the investor's cash resources such as bank letter or other formally recognized documents; (c) audited financial profit and loss and balance sheet statements for the previous five (5) years;</p> <p>(iii) market plan for the investors product(s) that includes a researched market analysis with evidence to support price and market sale assumptions;</p> <p>(iv) Evidence of formal agreements with sector businesses partners to utilize the facility, and;</p> <p>(v) Investor must be a member of a formal Product Group formed under the project, and the proposal clearly demonstrates how the investment will contribute to enhancing value chain performance through supply logistics and management, quality assurance, value addition, and forwards and backwards linkages.</p> | <p>Grant Amount: two (2) only grants of up to \$200,000 per investment. Only one (1) grant per business. Enterprises that are awarded Strategic Multi-Product or Sector level grants are not eligible for Viability Gap Grants for Enterprises.</p> |
| <p>Additional: Alignment with the Lang Son PPC agro industrial zone strategy is preferred but not required if the business case for alternative location is supported. Applications can that includes the investment of additional funds by investors from outside of the province will be encouraged by the PPC. Proposals that feature increased professional and skilled jobs will also be given weighting.</p> | |
| Viability Gap Grants for Enterprises | |
| <p>Purpose: to assist the enterprises to overcome viability gaps and invest in facilities, equipment, research services, and market development that increase their competitiveness in national and export markets.</p> | <p>Grant Amount: Grants from \$30,000 to \$150,000. Only one grant per business entity allowed. The enterprises one Viability Gap Grant application may include proposals for:</p> <p>(i) equipment, facilities etc,</p> <p>(ii) market development, and;</p> |
| <p>General Conditions:</p> <p>(i) Investor to provide at least 51% of the total planned investment;</p> <p>(ii) Viable business plan that includes: (a) five (5) year financial</p> | |

| Grant Purpose and Conditions | Grant Fund limits |
|---|--|
| <p>projections that confirm the financial viability of the proposed investment and demonstrates the investment propositions contribution to the increased profitability of the business; (b) all sources of finance for the proposed investment, including evidence of the investor's cash resources such as bank letter or other formally recognized documents; (c) audited financial profit and loss and balance sheet statements for the previous five (5) years;</p> <p>(iii) market plan for the investors product(s) that includes a well-founded market analysis with evidence to support price and market sale assumptions;</p> <p>(iv) Investor must be a member of a formal Product Group formed under the project, and the proposal clearly demonstrates how the investment will contribute to enhancing value chain performance through supply logistics and management, quality assurance, value addition, and forward and backward linkages.</p> <p>Note: Market development is encouraged under an Enterprise Viability Gap Grant.</p> <p>Additional conditions for use viability gap grant for market development are:</p> <p>(i) The enterprise must utilize the grant within a two (2) year period;</p> <p>(ii) The costed time of the enterprise's staff members are not an eligible as part of the enterprises contribution;</p> <p>(iii) The enterprise will prepare a market development proposal as part of its marketing plan. The marketing plan must feature the market development potential based upon reliable market data;</p> <p>(iv) market development funding from the project must not be used concurrently with any market development funding provided by the Lang Son provincial government.</p> <p>Note: Innovative applied research is also encouraged under an Enterprise Viability Gap Grant.</p> <p>Additional conditions for use viability gap grant for innovation applied research development are:</p> <p>(i) The enterprise must utilize the grant within a one (1) year period;</p> <p>(ii) The innovation applied research proposal must clearly demonstrate benefits through at least one of following: increased product quality, greater processing efficiency and throughput, and new product development that will increase the viability of the enterprise through increased market opportunities and higher product prices;</p> <p>(iii) the innovative applied research must be undertaken by a registered competent entity (that has no joint ownership with the enterprise applicant) and formalized by an output based contract;</p> <p>(iv) State-owned-enterprises, and government research institutes may be contracted for innovation research if they are legally and financially autonomous, operate under commercial law, and are not dependent agencies of the borrower or sub-borrower;</p> <p>(v) the innovation applied research proposal must include evidence of supply agreements with producer groups and details of how increased product prices will be shared with the producer group members.</p> | <p>(iii) innovation research.</p> <p>A proposal is permitted to include application for all three sub categories above. One business enterprise can only make one grant application over the life of the project, and the maximum value of this application is \$150,000.</p> <p>Applications for marketing and innovation research have additional conditions and these are detailed below.</p> |
| <p>Non Mandated: Higher weighting will be given to proposals that: (i)</p> | |

| Grant Purpose and Conditions | Grant Fund limits |
|--|---|
| provide evidence of value chain linkages with district and commune based small processors, traders and collectors, (ii) include poor households as active chain members. | |
| Viability Gap Grants for Smaller Enterprises | |
| Purpose: to assist the smaller value chains enterprises that face challenges accessing credit for investment in value adding equipment, market development, and for working capital. | Grant Amount: Grants from \$5,000 up to \$30,000. Only one grant per business entity allowed. |
| <p>Conditions:</p> <p>(i) Investor to provide at least 20% of the total planned investment;</p> <p>(ii) Viable business plan that includes: (a) five (5) year financial projections that confirm the financial viability of the proposed investment and demonstrates the investment propositions contribution to the increased profitability of the business; (b) all sources of finance for the proposed investment, including evidence of the investor's cash resources such as bank letter or other formally recognised documents; (c) financial profit and loss and balance sheet statements for at least the previous three (3) years (must be certified by a competent district authority -if not audited);</p> <p>(iii) market plan for the investors product(s) that includes a well-researched market analysis with evidence to support price and market sale assumptions;</p> <p>(vi) Investor must be a member of a formal Product Group formed under the project, and the proposal must clearly demonstrate how the investment will contribute to enhancing value chain performance through supply logistics and management, quality assurance, value addition, and forwards and backwards linkages.</p> <p>Note: small businesses are encouraged to make joint market development applications.</p> <p>Where a viability gap grant is used for market development the following additional conditions apply:</p> <p>(i) the costed time of the enterprise's staff member(s) are not an eligible cost as part of the enterprise's contribution;</p> <p>(ii) the enterprise (or enterprises) will prepare a realistic market development proposal as part of its marketing plan. The marketing plan must feature the market development potential based upon reliable market data, and;</p> <p>(iii) market development funding from the project must not be used concurrently with any market development funding provided by the Lang Son provincial government.</p> | |
| Non Mandated: Higher weighing will be given to proposals that; (i) demonstrate a combined market development approach between small enterprises; (ii) provide evidence of value chain linkages with district and commune based small processors, traders and collectors; (ii) include poor households as active chain members. | |

2. Procedures for Agri-Enterprises Viability Gap Grants

445. Applicants will be required to present a full business plan with a supporting investment proposal that demonstrates how the additional investment addresses:

- (i) The enterprises business and market development plan is aligned with the Product sector development plan;
- (ii) Market opportunities in the horticulture sector strategic plan that justifies the market opportunity based upon multiple sources of market information;
- (iii) Clearly establishes how the enterprise will function within the Product value chain in terms of forward and backward linkages, supply management, quality assurance and value addition;
- (iv) Presents a clear financial plan for the business to confirm its viability including both profit and loss forecasts, balance sheets details and financial projections for a minimum of 5 years;
- (v) Provide a detailed investment plan that defines what is being sourced, the expected costs, expected benefits and impacts on the enterprise;
- (vi) Evidence to support assumptions on price and market sales, capacity utilization, and;
- (vii) Detailed breakdown of conversion factors from raw material to factory door.

446. Viability gap grants for market development must also

- (i) Provide a detailed market development plan that defines the marketing strategy and marketing activities, the expected costs, expected benefits and impacts on the enterprise;
- (ii) Evidence to support assumptions on market opportunities, market prices and potential market contracts or agreements.

447. Viability gap grants for applied innovations must also

- (i) Provide a detailed plan for the utilization and impact of the innovation that defines the expected costs, expected benefits and impacts on the enterprise;
- (ii) Evidence to support assumptions on how the innovation will contribute to increase financial performance of the enterprise.

448. The application will include a financing plan for the investment that includes all sources of finance and then presents the need for viability gap financing and how much incremental value the viability gap financing creates. Evidence of own resource availability will be required either through cash resources or bank letter.

3. Note

449. The Board of HortLangSon has the discretion to exceed the indicated funding limits by 15% based on the proposals received. If the Board requires an increase to the maximum amounts, it can seek prior approval with the PMU and the ADB with a supporting document that clearly demonstrates the benefits to the Project outcome.

450. The viability gap grants for enterprises will follow the ADB procurement guidelines for the use of ADB finance for partial financing of subprojects through small and medium enterprises. The grant process is Competitive and grants will only be approved by PMU or the PPC if the application is a viable and feasible proposition in accordance with normal commercial practice. Final evaluation criteria for each type of grant will be prepared by HortLangSon and must reflect commercial practice and be approved by PMU and ADB. Each applicant will be assessed on:

- (i) Market assessment and fit;

- (ii) Technical proposal feasibility;
- (iii) Financial profitability and viability of enterprise;
- (iv) Proven need for viability gap financing;
- (v) Contribution to inclusive development through
 - (a) Backward linkages supply chain systems
 - (b) Employment generation
 - (c) Gender and ethnic people's empowerment opportunities
- (vi) The competitive bidding aspect will be prioritized on the lowest viability gap funding per addition dollar of value addition;
- (vii) Compliance with project environmental regulations.

451. Grant evaluations will be undertaken by the HortLangSon Service Provider and the following evaluation process will be applied.

452. HortLangSon will evaluate each application based upon the agreed criteria;

- (i) Approval of all Viability Gap Grants for Enterprises over \$50,000 will be evaluated by a committee comprising HortLangSon, PMU and the Service Provider. The HortLangSon Board will formally submit a recommendation to the PPC for approval
- (ii) A formal recommendation for grant awards, grant amounts and the use of grant funds will be supplied by HortLangSon to the PMU Project Director within 45 days of application closing dates;
- (iii) The Lang Son DPI will have 15 days to seek clarifications from HortLangSon and approve the grant awards;
- (iv) The Multi Product Grants and the Agri-Enterprise Viability Grants must be approved by the PPC.

4. Viability Gap Grant contracts

453. Following approval of the grants the PMU will formalise the grant contract between:

- (i) The beneficiary agri-enterprise;
- (ii) Lang Son DPI (as Project Owner), and;
- (iii) HortLangSon Board of Directors.

454. HortLangSon will assist the PMU with the preparation of the contract instruments. The contract will specify the use of funds on a reimbursement basis with the required documentation of expenditure for both the ADB financing and the enterprises own resources. The documentation will be in the form of acceptable invoices, statements and receipts, but will not require any additional procurement documentation such as proof or support for the selected procurement approach.

455. On receipt of the required documentation HortLangSon will confirm the purchases through site visits and will submit to the PMU the invoice along with a confirmation report for the agreed investment. The PMU will process and reimburse the claimant directly from the advance account.

5. Financial and Procurement systems

Table 79: Summary of Procurement Procedures

| Activity | Responsibility | Procurement Method and procedure |
|---|------------------------------|---|
| Competitive Enterprise Viability Gap Grant procedures defined and reported to PMU PPC | SP and Transformation group | Not required |
| Application process outlined, application formats and requirements agreed and application submission templates developed, supporting documentation agreed | SP/PMU/HLS | Not required |
| Establish the range of required conditionalities to access the VGG such as forward linkages to markets and backward linkages to suppliers and agents to ensure inclusiveness Further, ensure the scope of the VGG is defined within priority products that have a Product Development plan | SP/PMU | NOT Required |
| Application evaluation systems and criteria defined with detailed procedural records, agreed criteria for ranking of proposals | SP/HLS | Not required |
| Form an evaluation committee, provide information and awareness of the VGG, its procedures and assessment | PMU/HLS/SP | Not Required |
| Conduct a public awareness campaign linked to the Chambers of Commerce to inform all horticulture related enterprises of the VGG programs | HLS / SP | SoE |
| Publicize the scope of the program in terms of product sequences, the timing of applicants, the presence of a help desk service in HLS for enterprises to contact and obtain technical support | HLS/PMU | SoE |
| Call of applications | HLS | Not required |
| Provide a technical support service for applicants | HLS/SP/PMU | SOE |
| Provide training sessions for potential applicants | SP/HLS | SOE |
| Receive and Review applications and copy to the review committee in the forms of a business plan and supporting investment proposal including own resources of at least 51% | HLS/SP/ Evaluation Committee | Not required |
| Review committee results are summarized and a recommendation provided to the PMU/PPC from HLS | HL/SP | Not required |
| Successful applicants publicly notified and posted to web | | |
| Applicants negotiate contract with | | |

| Activity | Responsibility | Procurement Method and procedure |
|---|----------------|--|
| HLS/PMU | | |
| Enterprise applicant proceed with procurement and implementation of business plan proposal | | Own systems. |
| On completion of works or as per contract the applicant will invoice the HLS/PMU for project share of costs | | Applicant must provide necessary transaction record documentation from quotations and purchase order invoices and statements under the name of the supplier, specification of procured goods, works and or services |
| Works site inspection | SP/HLS/PMU | Site inspection team will verify expenditure and compliance with business plan, it will ensure that the enterprise has contributed its own resources through a documentation and financial record check The team will provide a recommendation to the PMU |
| Recommendation for reimbursement of cost | HLS | HLS will provide a recommendation for payment of the enterprise invoice based on the site visit inspection, a review of documentation to ensure compliance with all required supporting documentation and compliance with conditions of approval. |
| Payment of invoice | PMU | PMU disbursement team process invoice |

6. Reporting

456. Each successful viability gap grant applicant will be required to submit quarterly reports to HortLangSon who will incorporate the relevant points into the overall Output 3 Quarterly Progress report. These reports by successful viability gap grant applicants will be required to be provided until the grant has been formally liquidated by the business as per project procedures. The reports will be based upon the Quarterly Progress Report format and highlight implementation progress, issues and solutions, as well as financial progress. HortLangSon will prepare the report template, and may also provide assistance with the preparation of the initial reports.

E. Producer Group Block Grants

457. Background: Grants provided to the Producer Groups will be through a block grant mechanism. The rationale for using block grants is that they provide flexibility for the Producer Group to decide upon their business investment priorities and plan the best use of the funds provided to develop their farming and business operations. This encourages the Producer Groups

to make market based decisions, and develop their group into a commercial self-reliant production and marketing business.

458. Block grant eligibility criteria and conditions are shown in Appendix 2 of this Manual. For the first Producer Groups to be formed: star anise and safe vegetables, the details of the respective funding packages are also included in Appendix 2 of this Manual. Block grant funding packages for the subsequent Producer Groups (that are expected to be formed from year 3 onwards) these will be developed by HortLangSon for approval by the PMU.

459. Main conditions associated with the block grants for the Producer Groups:

- (i) Must be a registered entity;
- (ii) Business plan will detail the expenditure upon the eligible items;
- (iii) Each group once it is registered must have a bank account;
- (iv) Each producer group, and all of its members, must be Product Groups members;
- (v) A formal or established market relationship with other Product Group members must exist.

460. HortLangSon will, in consultation with the PMU, develop and revise (if necessary) the conditions for the subsequent groups based upon the experience of the star anise and safe vegetables groups. The block grant mechanism has been used to provide flexibility in the planning of the grant investments. Each group will have differing land areas, topographic features, road or track access, and distance to other resources such as water. The production priorities for each group may also differ and some may wish to undertake value adding activities. Investment will be driven by each group's business plan and is not conditional upon being included in the commune's New Rural Development plan.

461. Funding and Investment categories: Funding ceilings for all Producer Groups will be \$50,000. Where groups have less than ten members the funding ceiling will be \$5,000 per member (one household equates to one group member). The Producer Groups will utilise these funds on the eligible items listed in the Table 80 below. Each group will prepare their own business plan and investment cost estimates. The HortLangSon Service Provider will evaluate the business plans and determine their feasibility and viability. The amount of grants funds allocated to the producer group will be decided as part of the business plan evaluation. The HortLangSon Board will endorse the Producer Group Business and Investment plan application for approval by the PMU.

Table 80: Eligible Expenditure Categories for Star Anise and Safe Vegetable Producer Groups and Investment Estimates

| Category | Guiding Notes |
|---|--|
| Star Anise | |
| Group formation legal fees and registration | Applies to the legal and registration fees only associated with the formation. HortLangSon will assist with the registration |
| Feeder roads | Justification for the investment in feeder roads must be based more efficient transport of star anise fruits from the point of harvest to the accumulation and pick up sites for sale or drying. Technical design of the roads will be based upon the New Rural Development technical specifications. Note: Output 3 feeder roads can be constructed even if they are not |

| Category | Guiding Notes |
|---|--|
| | included in the commune's New Rural Development plans. |
| Harvesting equipment | Equipment that will assist with high tree harvesting of fruits and their transfer to accumulation points. Funds may be used for the development and construction of the harvesting equipment. HortLangSon will coordinate any harvesting equipment development. Note: harvesting equipment does not include drying equipment. |
| Contracted technical services | For advisory services to assist with production, processing and marketing assistance. State-owned-enterprises, and government research institutes that agri-enterprises may be contracted for innovation research if they are legally and financially autonomous, operate under commercial law, and are not dependent agencies of the borrower or sub-borrower. |
| Star anise production inputs | Fund production inputs such as fertiliser and safe and registered agri-chemicals |
| Safe Vegetables | |
| Group formation legal fees and registration | Applies to the legal and registration fees only associated with the formation. HortLangSon will assist with the registration |
| Feeder roads | To connect safe vegetable production areas with village roads to facilitate more efficient vegetable transport. The construction of the feed roads must be justified on the basis of efficient transport of the safe vegetables. Technical design of the roads will be based upon the New Rural Development technical specifications. Note: Output 3 feeder roads can be constructed even if they are not included in the commune's New Rural Development plans. |
| Irrigation equipment: pumps, storage tanks, hoses and trickle feed nozzles etc. | Trickle irrigation will be used that promotes economic use of water. The irrigation equipment will differ for groups due to farm production area, intensity of production system, and distance to water source. It will be designed to be used in conjunction with the group's shade house. Conditions are: <ul style="list-style-type: none"> • irrigation equipment must be used on a shared basis; • no individual farmer can have exclusive use of the irrigation equipment; • block grant funds are not permitted to be used to upgrade or extend commune irrigation canals. |
| Shade house | The group's shade (green) house will be shared facility that will aid intensive safe vegetable production both in-season and out-of-season. Conditions are that: <ul style="list-style-type: none"> • shade houses must be used on a shared basis; • no individual farmer can have exclusive use of the shade house. |
| Contracted technical services | For advisory services to assist with production, processing and marketing assistance. These services may include design of the irrigation system and shade houses. State-owned-enterprises, and government research institutes that agri-enterprises may be contracted for innovation research if they are legally and financially autonomous, operate under commercial law, and are not dependent agencies of the borrower or sub-borrower. |
| Safe vegetable production | Funding of the inputs for the first safe vegetable production cycle. It |

| Category | Guiding Notes |
|----------|--|
| inputs | is highlighted that the Farm Production Group will be responsible for managing the working capital to fund the inputs required after the first production cycle. |

1. Producer Group Business plan

462. Each Producer Group will be required to prepare a business plan that will present the group's plan for the development of their farming group business. The business plan must reflect the Product development plan (for the Product group that the producer group is a member of). It is recognized that the Producer Groups lack the expertise to prepare their business plans and they will be assisted by Service Provider staff in this task. The business plan will be the basis for approval of the project's financial support for the Producer Group. Once the Producer Group has been formed and registered (as either a formal collaborative group or as a cooperative) the group will be assisted to prepare their business plan.

- (i) Preparation of the group's business plan must be done in participative and inclusive manner that involves all group members;
- (ii) The group's business plan will present the business case for the Output 3 investment in each group through the block grant mechanism.

463. Output 3 features a market led approach to value chain development and each group's business plan must be prepared for a five year period and include the following elements:

- (i) Consistent with the Product group development plan and explain how the producer group will establish its business connections with the other Product group member agri-enterprises, including marketing agreements;
- (ii) Market analysis for the group's product that presents an assessment of market opportunities, market trends and market risks;
- (iii) Marketing plan including any formal market agreements and identification of potential marketing arrangements with processors or retailers;
- (iv) Production plan that describes the product(s), the production areas and expected output;
- (v) Financial analysis that presents the net gross margin per crop per land unit, the annual income per land unit and the annual income per group, and per member;
- (vi) Group investment plan including both the project investments through the block grant and also any investment by the group members either financial (cash) or in-kind. Please Note: the group's financial plan must demonstrate how the group will manage their working capital to ensure that there are adequate funds available to fund the inputs required for each successive production cycle. The group's business plan must show that the group members will have adequate funds for the inputs required for the second production cycle;
- (vii) Be consistent with the project's inclusive approach and ensure that the Output 3 GAP actions and targets are addressed and that there is compliance with the project's social safeguards regulations;
- (viii) Risk assessment that identifies the main risks and a feasible mitigation plan;
- (ix) Identify any environmental issues and ensure compliance with the project's environmental safeguards regulations – especially safe use of agro-chemicals;
- (x) Implementation plan and schedule that details the implementation arrangements, timing of the investment activities, and procurement plan.

464. Evaluation of the Producer Group business plan will be based upon:

- (i) Degree of alignment with the Product Group development plan;
- (ii) Technical production proposal feasibility;
- (iii) Sound market analysis;
- (iv) Financial profitability over a five year period – including funding of working capital;
- (v) Viability gap financing i.e. the block grant is justified;
- (vi) Feasible risk mitigation plan;
- (vii) Compliance with project environmental regulations.

465. HortLangSon will prepare the template for the Producer Group business plan and will be responsible for the evaluation of Producer Group grants. The HortLangSon Service Provider will prepare evaluation guidelines that will be approved by the PMU and ADB.

2. Producer Group contracts

466. Following approval of the block grant the PMU will formalize the grant contract between:

- (i) Producer Group executive with supporting signatures of all members;
- (ii) Lang Son DPI (as Project Owner), and;
- (iii) HortLangSon Board of Directors.

467. HortLangSon will assist the PMU with the preparation of the contract instruments.

3. Financial

468. Producer Groups must follow ADB procurement shopping procedures. This is a simple process that entails group obtaining three (3) documented equivalent quotes, and the selection of the lowest cost supplier. HortLangSon (Financing and Grant expert) will provide support to each group with the procurement. The following procedures will apply:

- (i) An initial advance (up to 20%) will be provided based on the provision of the three (3) quotations for each category of expenses;
- (ii) The advance will be paid to the group's bank account;
- (iii) There will be a final payment of the balance (80%) based upon completion of the works with a verification report provided by the HLS /PMU team;
- (iv) All supporting documentation for the procurement including invoices, statements and receipts are required to be submitted to HortLangSon before the final payment is processed;
- (v) HortLangSon will inspect the equipment procured and the works to ensure that they meet the appropriate standards;
- (vi) Following the inspection HortLangSon will provide a recommendation for payment along with the reimbursement claim to the PMU;
- (vii) The PMU will review the claim and make final payment to the group's bank account from the project's advance account.

Table 81: Summary of Producer Group Procurement Procedures

| ACTIVITY | Responsibility | Procurement Method and Procedure |
|---|--|--|
| Producer Grants procedures drafted | SP/PMU | Not required |
| Producer group grant application documentation prepared and piloted | SP | Not required |
| Producer group application review procedures defined, documented | SP/PMU | Not required |
| Producer Group Grant programs awareness and education program developed and implemented for each priority product group | HLS/SP | SOE for process costs |
| Producer group formed and members understand the value chain support program | SP and DARD Meetings and awareness raising of the issues | Not required |
| Producer group investment plan produced | SP, DARD, DOIT and group members | Time based input no procurement required |
| Producer group applications reviewed for completeness | SP | Not required |
| Producer group grant applications received | HLS/SP/PG | Not required |
| Application evaluations | PMU/SP/H:S | Not required |
| Successful applications notified and publicly recorded on the web | HLS/PMU/SP | Not required |
| Producer group contract award | PMU/HLS | Not required |
| Producer group members conduct own procurement for the items approved in their investment plan using a shopping modality for 3 quotations | PG Members | Shopping 3 quotes where applicable |
| Producer group submit procurement invoice and supporting documentation to the HLS/SP who undertake a site visit to verify items and the quality of purchases or works | PG | |
| SP will submit a site visit report with recommendation for reimbursement of expenses | SP | Not Required |
| PGP bank transfer to their bank account from HLS/PMU advance account | PMU | SOE Procedures |

4. Reporting

469. Each Producer Group will be required to submit quarterly reports to HortLangSon who will incorporate the relevant points into the overall Output 3 Quarterly Progress report. These reports will be based upon the Quarterly Progress Report format and highlight implementation progress, issues and solutions, as well as financial progress. HortLangSon will prepare the report template, and may also provide initial assistance with the preparation of the reports.

VII. Gender

470. Section VII Gender is an important section that aimed at all the staff in the provincial and district agencies, units and departments and the communes and the HortLangSon service provider that will be involved in the Output 3 implementation:

- (i) PMU;
- (ii) HortLangSon Service Provider;
- (iii) Departments;
- (iv) District: DPC, divisions and service units;
- (v) Officials at commune level;
- (vi) Product Group leaders and members;
- (vii) Producer Group leaders and members.

A. Contents of this Section

471. Chapter VI describes the main implementation tasks associated with

- (i) Gender policies
- (ii) GAP targets and actions

472. Background: Design of Output 3 has an inclusive approach that features enhancing the role of women in project activities and ensuring that they equitable access to the project resources. Women play a prominent role in Lang Son's horticultural sector in both farm production and also in the agri-enterprises. Output 3 will strengthen the role of women at all levels in the sector including in the governance of Product groups and HortLangSon. The Gender Action Plan (GAP) outlines the Output 3 gender actions and targets.

473. HortLangSon and other associated agencies will follow a gender mainstreaming approach to the implementation of Output 3. This approach will ensure that women are actively involved in all of the Output 3 activities. The HortLangSon Service Provider will be responsible for ensuring that the gender mainstreaming approach in the implementation of the Output 3 activities is followed.

474. It must be noted that while the Lang Son PMU has a Social Safeguards/Gender Focal Point it is NOT the role of the Gender Focal Point to lead gender implementation in Output 3. The Gender Focal Point role will be advised on gender and support the HortLangSon Service Provider with the gender main streaming work. The Loan Implementation Consultant (LIC) will have a Gender Adviser who will assist the PMU Gender Focal Point and advise the Service Provider on implementation of the effective gender mainstreaming approach and will also provide some gender training.

475. Output 3 contains some gender innovations and that will require the HortLangSon Service Provider, the Gender Focal Point and the LIC Gender Adviser to work closely on. These include:

- (i) Governance Accelerator program that targets women and will provide potential women leaders with training to prepare them for governance roles in Product Groups and on the HortLangSon board;
- (ii) Producer Group leadership training for women;
- (iii) Business and market plan preparation training and mentoring for women involved in managing agri-enterprises;

- (iv) Field services staff (both men and women) training in methods of working with women and ethnic minority farmers, including women with low numeracy and literacy.

476. These gender innovations are important to increasing the active participation of women in all the Output 3 activities and successful development of the horticultural sector. HortLangSon (with some PMU support through the Gender Focal Point) will be responsible for ensuring that the gender targets for sector development in the GAP are complied with. These targets are summarized below in Table 82.

Table 82: Main GAP Targets related to Sector Development

| Action | Target | Comment |
|---|---|---|
| Enhance women's participation in decision and participation in service delivery | At least 35% of HortLangSon Board are women | HortLangSon and the PMU needs to identify potential women board members and ensure they are included in the Governance Accelerator training program |
| | Each Product group formed by the Project: at least 40% of members must be women | It is expected that at least five Product groups will be formed and the target is 50% of women's membership |
| | Women's membership of Producer Groups must be at least 50% | This applies to all groups. It is expected that for the vegetable groups that the women's membership will be 70 to 80%. |
| | At least 40% of HortLangSon field staff must be women | From the start of the HortLangSon contract. |
| Enhance women's economic benefit and decision making | At least 10% of the leaders of the Producer Groups supported by the project are women | This includes the star anise and vegetable groups. It is expected that with the group leadership training provided to women that the percentage of women leaders will quickly exceed 10%. This target will be reassessed at mid term. |
| | At least 10% of the 30 enterprise grants must go to agri-enterprises managed by women | This refers to the viability gap grants. It is expected that the 10% target will be quickly achieved and the target will be rest at mid term |

477. The PMU is responsible for the following capacity building GAP targets and actions as shown in Table 83 below.

Table 83: PMU GAP Actions and Targets

| Target | Comment |
|--|--|
| PMU has 40% women as staff | DPI will be responsible for achieving this target |
| Gender Action Plan (GAP) briefing is conducted for PMU staff | This will be conducted by the LIC Gender Consultant |
| Project M&ER includes sex disaggregated data collection and data for GAP and DMF related targets | This will be part of the project's PPMS and will be led by the PMU M&E consultant. The policy will be to always lect gender disaggregated data |

| Target | Comment |
|---|--|
| Gender consultant is recruited to support GAP implementation | |
| Gender Focal Point in PMU is to be responsible for GAP implementation | Gender Focal Point will work closely with HortLangSon Service Provider to achieve the gender targets |

478. Once the HortLangSon Service Provider is appointed the PMU Gender Focal Point should start to work closely with the Service Provider. Some key task areas for the PMU Gender Focal Point (with guidance from the LIC gender Consultant to work with HortLangSon are:

- (i) Ensure that there is high awareness by women of Output 3 and how they can participate in it and access the resources;
- (ii) The Women's Union network in the districts and communes will be a main partner for information dissemination;
- (iii) Formation of the Product Groups to ensure that women are actively involved, as members and in the leadership;
- (iv) Formation of the Producer Groups to ensure that women are actively involved, as members, and in group leadership;
- (v) Women agri-enterprise owners and managers are informed of the Output 3 grant program (viability gaps and marketing) and able to access assistance to prepare business and marketing plans;
- (vi) Women involved in agri-enterprises (members of the Product Groups) are made aware of the governance accelerator training program and participate in the program;
- (vii) Women members of Producer Groups actively participate in the group leader training courses;
- (viii) Ensure that technical training course delivery occurs at times that enable women to attend.

VIII. Performance Monitoring and Reporting

479. Section IX Performance Monitoring and Reporting is aimed at all the staff in the provincial and district agencies, units and departments and the communes and the HortLangSon Service Provider that will be involved in the Output 3 implementation:

- (i) PMU;
- (ii) HortLangSon Service Provider;
- (iii) Departments;
- (iv) District: DPC, divisions and service units;
- (v) Commune People's Committee;
- (vi) Beneficiaries: farm producer group leaders.

A. Contents of this Section

480. Chapter VI describes the main implementation tasks associated with

- (i) Performance Monitoring
- (ii) Reporting

B. Performance Monitoring

481. Performance monitoring of the project will be achieved through the Project Performance Monitoring System (PPMS). The Lang Son PMU M&E staff member, under the direction of the PMU Director, will be responsible for developing and maintaining the Lang Son PPMS and report updated progress on a quarterly basis. The PPMS will include the Output 3 performance monitoring there will be four kinds of monitoring: (i) implementation progress monitoring; (ii) safeguard monitoring; (iii) benefit monitoring and evaluation; and (iv) GAP monitoring. The PPMS Output 3 monitoring will include:

- (i) DMF Output 3 indicators;
- (ii) GAP Output 3 targets.

482. PPMS development and maintenance for Output 3 will also involve the input of the Gender Focal Point, Agricultural specialist, Social and Environmental Safeguards specialists, as well HortLangSon. Note: Finalisation of the Output 3 part of the PPMS should be not completed until the HortLangSon Service Provider has had the opportunity to contribute. Development of the Output 3 part of the PPMS should be completed by December 2018.

483. Development of the Output 3 PPMS section will incorporate additional indicators and targets to supplement the DMF indicators and GAP targets. These additional indicators and targets will be based upon activities in the Output 3 design matrix (Appendix 1). For each of the Output 3 sub project data sets will be gathered at the commencement of the sub project and their activities e.g. formation of a Producer Group. The main tasks to be completed and responsibilities will be as shown in Table 84 below.

Table 84: Main Output 3 PPMS Development Tasks, Timing and Responsible

| Task | Timing | Responsible |
|---|-----------------------|--|
| Output 3 section: DMF and GAP | From project start up | PMU M&E staff member: assisted by Gender Focal Point |
| Output 3: additional indicators and targets | | PMU M&E staff member: HortLangSon |
| Output 3 sub projects: Baseline data sets | | HortLangSon |

484. The baseline dataset for each subproject for each activity will define:

- (i) the implementation timelines and milestones;
- (ii) outputs delivery progress;
- (iii) final output; and
- (iv) the contribution of each subproject's activities to the outcome indicators.

485. The PMU M&E staff member will be responsible for managing the periodic gathering and analysis of the data for the Quarterly Progress Reports. Responsibilities for the gathering of the Output 3 field data are shown in Table 85 below.

Table 85: Output 3 Field Data Gathering Responsibilities

| Sub Project and Activity Data | Responsible |
|--|--------------------------------------|
| Sub Project 3.1: Horticultural Industry Sector Organization | |
| Activities 3.1.1 to 3.1.10 | HortLangSon |
| Sub Project 3.2 Star Anise Value Chain Development | |
| Activity 3.2.1 | HortLangSon |
| Activity 3.2.2 | HortLangSon |
| Activity 3.2.3 | HortLangSon, Commune, Producer Group |
| Activity 3.2.4 | HortLangSon, Commune, Producer Group |
| Sub Project 3.3: Safe Vegetable Value Chain Development | |
| Activity 3.3.1 | HortLangSon |
| Activity 3.3.2 | HortLangSon |
| Activity 3.3.3 | HortLangSon, Commune, Producer Group |
| Activity 3.3.4 | HortLangSon, Commune, Producer Group |

486. HortLangSon field staff will be responsible for data gathering once value chain implementation commences but will progressively pass over the data gathering responsibility to the Producer Group under the supervision of the Commune Coordination Group. This is consistent with the Output 3 objective of the Producer Groups becoming commercial self-reliant entities.

1. Reporting

487. Lang Son as the coordination PMU is required to provide an Annual Workplan Report and also a Quarterly Progress Reports to the ADB. Because Output 3 features horticultural sector development it differs to the other outputs and the content of reporting will be different to the other outputs. Reporting requirements for the project are outlined in the PAM Chapter XI Section C.

488. The PMU is responsible for managing Output 3 Annual and Quarterly reporting tasks and submission of the final reports to the ADB. Reporting tasks will be delegated to the HortLangSon Service Provider and to the PMU staff.

- (i) The PMU Director will set deadlines for the completion of the reports that ensure the reports met the reporting timetable required by the ADB;
- (ii) The PMU Director will formalize the HortLangSon reporting responsibilities once the Service Provider is contracted.
- (iii) The PMU will prepare templates for the Annual Report and the Quarterly Report based upon the indicative table of contents in PAM's Annex E.

489. HortLangSon will prepare the relevant Output 3 sections for the Annual Report. These are:

- (i) Progress achieved by Output 3: this will be based upon the DMF indicators, and the GAP indicators (there is some overlap between the two sets of indicators);
- (ii) Main implementation issues and how any issues affecting implementation are to be solved (solutions);
- (iii) Updated Output 3 Implementation plan.

490. **Note:** the PMU will need to report upon the updated procurement plan. Once the PPMS is established and operational additional data (to the DMF and GAP measures) will be available for inclusion in the Annual report.

491. HortLangSon will also prepare the relevant Output 3 sections for the Quarterly Progress Report. The format for the Quarterly report will follow the Annual report and include:

- (i) Implementation progress against the annual implementation plan and indicators included in the PPMS;
- (ii) Implementation issues and actions required to respond to the issues.

492. Several indicators (especially the DMF indicators) will not be achieved until later stages of the project and therefore the emphasis in the quarterly reporting will be upon the more immediate implementation indicators and targets in the PPMS. HortLangSon should submit the Quarterly Report to the PMU within 10 working days following the end of the Quarter being reported upon.

493. **Note:** For both the Annual and Quarterly reports HortLangSon will coordinate with the PMU M&E staff member over reporting implementation progress based upon the PPMS, DMF and the GAP indicators. Similarly, the Gender Focal Point will contribute to GAP indicator progress reporting. Other PMU staff will also contribute to the preparation of the Annual and Quarterly Progress Reports based upon their Output 3 responsibilities: Agriculture specialist and the Social and Environmental safeguards specialists.

Appendices

Appendix 1: Output 3 Design Matrix

| Narrative | Notes | Indicators | Risks |
|---|-------|--|---|
| Outcome | | | |
| <p>Improved horticultural sector economic performance through a coordinated industry led business and market focused strategy for sector growth and development that features market driven product value chains aimed at added value “export” markets, encourages investment in sector industries, prioritises quality assurance, achieves strong business relationships between value chain actors, and where income for all actors, including women and men farmers, is increased. The value chain development will enhance inclusive growth along the chain and provide increased economic opportunities for ethnic minorities and women that will enhance their empowerment.</p> | | <p>Increase in Lang Son horticultural sector economic output (total, %)</p> <p>Increase in value of exports by horticultural sector products (total, %)</p> <p>Increase in horticultural sector investment for processing, facilities, production and market development (total, %)</p> <p>Number of product value chains with contracts between members (Number, %)</p> <p>Increase in farmer income for selected products: star anise, vegetables (total, %)</p> <p>Number of women members of farmer groups (number per group, %)</p> | <p>Export market demand for agro-food products is influenced by difficulties with trade agreements</p> <p>Horticulture sector product growth and development prospects are limited to due low competitiveness and weak market opportunities</p> <p>Horticulture sector members do not the support the formation of HortLangSon</p> <p>Low interest by investors the horticulture sector</p> <p>Farmers do not agree to form farmer groups</p> <p>Small and medium collectors do not join product groups</p> <p>Women are constrained by multiple duties from participation in farmer groups</p> |
| Output 3.1: Horticultural Sector Industry Organization | | | |
| <p>Objective: To develop a horticultural sector industry organisation that will be responsible for strategic sector planning and oversight, enhanced quality control standards, trade relationship and compliance, and representing the</p> | | | |

| Narrative | Notes | Indicators | Risks |
|--|--|--|---|
| product sector members. | | | |
| Activities | | | |
| 3.1.1 Implementation and Contract Supervision Service Provider appointed | PMU contracts the Service Provider (Advance Action) | Service provider contracted | No suitably qualified service providers based in Viet Nam |
| 3.1.2 HortLangSon Board and Sector Transformation group appointed | HortLangSon interim Board of private sector and government department representatives appointed and | HortLangSon formation approved by PPC Legal documents completed | Not enough suitably experienced private sector members to be appointed to the interim Board |
| 3.1.3 Horticulture sector strategic plan (HSSP), and associated business plan prepared | HSSP will provide the basis for sector development and the main products. Market plans will also be prepared first for star anise and vegetables. Subsequent market plans will be prepared for the other priority products that have been identified in the sector strategy. Sector strategic plan will identify potential investment areas with a plan to encourage outside investment | Number of sector groups meetings conducted (Number of participants per meeting, gender disaggregated %) Business Plan approved by interim Board Sector Strategic and Market Plan approved by interim Board | Participation of sector members, including women, in meetings is low |
| 3.1.4 HortLangSon Secretariat established and operational | Service provider will be responsible for developing the role of HortLangSon, its Secretariat, and technical services to support the product value chain development. Activities 3.1.7, 3.1.8 & 3.1.9. | Secretarial Operational Core service functions initiated | Delays in providing services |
| 3.1.5 Product groups formed and operational | Form separate Product groups based on the main horticulture products, and use as the basis for product development activities. Assist Product groups to develop their roles and become active in sector activities and development | Product group formed (Number, % women members) | Sector members do not understand the merits of Product groups and do not participate |
| 3.1.6 Competitive | Viability gap grants for | Competitive | Sector agro-businesses, |

| Narrative | Notes | Indicators | Risks |
|--|---|--|---|
| funding mechanism established | enterprises: (i) sector level strategic grants for agri-enterprises; (ii) enterprise grants; (iii) smaller agri-enterprise grants, and; market development grants. Women entrepreneurs encouraged and supported to apply for funds | funding regulations approved Number of investment proposals submitted and approved (number, %) Number of funding applications by women led businesses (%) | product groups and farmer groups are slow to apply for grants |
| 3.1.7 Trade, markets and quality information and support provided to members | HortLangSon provides support and information to members about trade, markets and quality requirements for export markets Women entrepreneurs encouraged and supported to apply for marketing grants | No. of requests for trade information (number, % women) No. of requests for market information (number, % women) | Low demand for information by sector members |
| 3.1.8 Quality assurance and compliance systems established | For sector awareness and to institute quality systems for products (standards, traceability, QR etc. systems) | Sector quality awareness program Quality assurance system established for first product | Product value chain members are reluctant to accept and institute quality assurance standards and system |
| 3.1.9 Sector outreach and education | Increase information sharing and increase awareness and knowledge of sector product group members and their value chains. Activities under 3.1.8 are where all the capacity development, extension and communications will be delivered. The scope of these is wide ranging and aligned with what is required to ensure that an inclusive agribusiness approach is applied. Learning needs will be formally assessed once implementation commences and the main theme areas will include: governance of sector organisations; business planning and management; quality | For capacity building activities: skills and knowledge learned and applied (participants, number of women (%)) Project information received by stakeholders (number, % women) Number of LURCs modified to include women on title | Outreach programs are poorly targeted and do not use methods to effectively communicate with all sector members Communication methods used are not inclusive |

| Narrative | Notes | Indicators | Risks |
|--|--|---|--|
| | assurance; marketing; and modern horticultural production techniques. Communications will actively target all sector members especially women and men farmers, and commune and district smaller scale agribusinesses. The program will also include awareness over joint title LURCs | | |
| 3.1.10 Design and implement system to monitor and assess sector performance | Establish system that enables sector and product performance to be proactively monitored Gender disaggregated data | Sector performance reported semi-annually interim Board and PPC | Sector members unwilling to provide information due to commercial sensitivity |
| Output 3.2: Star Anise Value Chain Development | | | |
| Objective: Market orientated star anise value chain developed that markets star anise spice and oil products that comply with international quality assurance standards ³⁰ to export markets and provides increased financial income to all value chain members | | | |
| Activities | | | |
| 3.2.1 Prepare plan for star anise value chain development | Prepared by HortLangSon | Star anise value chain development plan prepared Number of sector groups meetings conducted (Number of participants, gender disaggregated %) | Market analysis shows that the market prospects are weak Low cooperation by chain members aligned to Chinese traders and processors |
| 3.2.2 Implement star anise value chain development plan | Businesses and farmer groups assisted to prepare business plans. Conditionality for all project investment assistance will be a | Main development plan tasks implemented (define measures based upon development plan) | Businesses and farmers do not understand the purpose of business plans |

³⁰ Benchmark will be United States Food Safety Modernisation Act 2011

| Narrative | Notes | Indicators | Risks |
|---|---|--|--|
| | business plan | No. of business plans for farmer groups No. of business plans for collectors and processors. | |
| 3.2.3 Assist farmer group formation and operations | HortLangSon to form farmer groups and assist their operations and provide technical production assistance Conditionality for group Project support is that they agree to operate as a group that shares project provided resources, and establish a contractual relationship to supply star anise to a Viet Nam based processor. | Groups formed (number., females, males) Groups with women leaders (number, %) | Some farmers unwilling to work in groups Women farmers not included in groups |
| 3.2.4 Farmer groups assisted with production and marketing advice | HortLangSon will assist farmer groups with technical production aspects | Group production and income (per season, per farmer (kg & \$)) Number of training courses per group (% men, women) | Farmer unwilling to invest in, and adopt, new production techniques |
| Output 3.3: Vegetable Value Chain Development | | | |
| Objective: Lang Son farmer groups producing “certified safe” vegetables for sale under business relationship to supermarkets and specialist vegetable retailers | | | |
| Activities | | | |
| 3.3.1 Prepare plan for vegetable value chain development (based on satisfactory market assessment) | Prepared HortLangSon and includes marketing plan | Vegetable value chain development plan prepared Number of sector groups meetings conducted (Number of participants, gender disaggregated %) | Low participation by vegetable farmers in vegetable sector consultations |
| 3.3.2 Implement vegetable value chain development plan | HortLangSon will coordinate with PPMU. All vegetable farmer groups will be assisted to prepare a business plan. | Main development plan tasks implemented (define based upon development plan) | Market analysis shows that the market prospects are weak Low number of vegetable farmers want to intensify their production systems |
| 3.3.3 Establish farmer groups and assist their | Farmer groups selected and formed. | Farmer groups with a business plan | Farmers have limited experience of working in |

| Narrative | Notes | Indicators | Risks |
|--|--|---|---|
| operations, and technical market assistance | Conditionality for group Project support is that they agree to operate as a group that shares project provided resources, and establish a contractual relationship to supply safe vegetables to supermarkets | Groups formed (Number, women members, men members %) Groups with women leaders (number, %) | groups Low numbers of women in the groups |
| 3.3.4 Farmer groups assisted with production and marketing advice | HortLangSon will assist farmer groups with technical production aspects | Increases in vegetable production (yield - kg) of selected crops Increase in income per season (crop, \$) Number of training courses per group (% men, women) | Farmer unwilling to invest in, and adopt, new production techniques |
| Output 3.4: Other Product Value Chain Development | | | |
| Product value chains developed marketing products that comply with international quality assurance standards to export markets and provide increased financial income to all value chain members | Other product value chain developments will occur only after the star anise and vegetable value chains have developed and operational for two years. | | |
| Activities | | | |
| 3.3.1 Prepare plan for product value chain development (based on satisfactory market assessment) | Prepared HortLangSon and includes marketing plan | Product value chain development plan prepared Number of sector groups meetings conducted (Number of participants, gender disaggregated %) | |
| 3.3.2 Implement product value chain development plan | Product group businesses and farmer groups will be assisted to prepare a business plan – this will be a conditionality for Project investment assistance. | Main development plan tasks implemented (define measures based upon development plan) Product Group businesses and farmer groups business and | |

| Narrative | Notes | Indicators | Risks |
|--|--|---|-------|
| | | market plan prepared | |
| 3.4.3 Establish farmer groups and assist their operations, and provide technical market assistance | Conditionality for group Project support is that they agree to operate as a group that shares project provided resources, and establish a contractual relationship for the supply of their product | Groups formed (number, females, males) Groups with women leaders (number, %) | |
| 3.4.4 Farmer groups assisted with production and marketing advice | HortLangSon will assist farmer groups with technical production aspects | Increases in production (yield - kg) of selected crops Increase in income per season (crop, \$) Number of training courses per group (% men, women) | |

Appendix 2: Summary of Conditions and Items Eligible for Project Grants

| Conditions Item | Note |
|--|---|
| <p>General Features: The Board of HortLangSon has the discretion to exceed the indicated funding limits by 15% based on the proposals received. If the Board requires an increase to the maximum amounts, it can seek prior approval with the PMU and the ADB with a supporting document that clearly demonstrates the benefits to the Project outcome.</p> <p>General Grant Conditions: All grants will be competitive, and all grant applications will have to meet the following basic requirement: Business plan that is both feasible and viable. All business plans must include: (i) statement of financial assets and liabilities; (ii) financial analysis of the proposed investments; (iii) cash flow projection for the proposed investment; (iv) details of the source of funds contributed by the investor (including investment funds by outside investors), and financing details for any loans; (v) technical assessment of the proposed investment activity; and, (vi) risk analysis covering market, financial and production risks, (vii) innovation research focused on product development and processing enhancements may also be included in the business plan. The format of the business plan for each type of grant is included in the Management Manual.</p> <p>Where any one investor has a financial interest in more than one business entity, only one of those entities will be eligible for grant assistance by the project.</p> <p>Compliance with Project environmental regulations is also a condition.</p> <p>Specific conditions for the Viability Gap Grants for Enterprise, and the Producer Groups grants are outlined below.</p> | <p>The use of a competitive award system is also proposed for all the grants Using this approach will enable. The successful bidders to use their own procurement systems significantly simplifying the project management and administration requirements. The resultant simplification will mitigate some of the procurement risk due to capacity identified within the Procurement Risk Assessment Management Plan (P_RAMP)³¹</p> |
| Viability Gap Grants for Enterprises | |
| 1. Strategic Multi-Product or Sector level | |
| <p>Purpose: to encourage investment in multi-use facilities that provide processing, packaging and storage services to a number of horticultural enterprises over the whole year (multi-purpose pack house model). A maximum of two such Grants are available</p> <p>Grant Amount: Grants of up to \$200,000 per investment. Only one (1) grant per business. Strategic Multi-Product or Sector level grants are not eligible for Viability Gap Grants for Enterprises.</p> <p>Conditions: (i) Investor to provide at least 51% of the total planned investment; (ii) Viable business plan that includes: (a) five (5) year financial projections that confirm the financial viability of the proposed investment and demonstrates the investment propositions contribution to the increased profitability of the business; (b) all sources of finance for the proposed investment, including evidence of the investor's cash resources such as bank letter or other formally recognised documents; (c) audited financial profit and loss and balance sheet statements for the previous five (5) years; (iii) market plan for the investors product(s) that includes</p> | <p>Farmer cooperatives are included in this category.</p> |

³¹ Supplementary document No.15 to the RRP

| Conditions Item | Note |
|--|---|
| <p>a well-founded market analysis with evidence to support price and market sale assumptions ; (iv) Evidence of formal agreements with sector businesses partners to utilize the facility, and; (v) Investor must be a member of a formal Product group formed under the project, and the proposal clearly demonstrates how the investment will contribute to enhancing value chain performance though supply logistics and management, quality assurance, value addition, and forwards and backwards linkages.</p> <p>Alignment with the Lang Son PPC agro industrial zone strategy is preferred but not required if the business case for alternative location is supported. Applications that include the investment of additional funds by investors from outside of the province will be encouraged by the PPC. Proposals that feature increased professional and skilled jobs as a result of the investment will also be given weighting in the evaluation.</p> | |
| <p>2. Enterprise Viability Gap Grants</p> | |
| <p>Purpose: to assist the enterprises to overcome viability gaps and invest in facilities, equipment, research services, and market development that increase their competitiveness in national and export markets.</p> <p>Grant Amount: Grants from \$30,000 to \$150,000. Only one grant per business entity allowed. The enterprises one Viability Gap Grant application may include proposals for: (i) equipment, facilities etc., (ii) market development, and; (iii) innovation research. Applications for marketing and innovation research have additional conditions and these are detailed below. One business enterprise can only make one grant application over the life of the project. The application may include the three sub categories above. The maximum value of the application is \$150,000.</p> <p>General Conditions: (i) Investor to provide at least 51% of the total planned investment; (ii) Viable business plan that includes: (a) five (5) year financial projections that confirm the financial viability of the proposed investment and demonstrates the investment propositions contribution to the increased profitability of the business; (b) all sources of finance for the proposed investment, including evidence of the investor's cash resources such as bank letter or other formally recognised documents; (c) audited financial profit and loss and balance sheet statements for the previous five (5) years; (iii) market plan for the investors product(s) that includes a well researched market analysis with evidence to support price and market sale assumptions; (iv) Investor must be a member of a formal Product group formed under the project, and the proposal clearly demonstrates how the investment will contribute to enhancing value chain performance though supply logistics and management, quality assurance, value addition, and forwards and backwards linkages.</p> <p>Note: Market development is encouraged under an Enterprise Viability Gap Grant.</p> <p>Additional conditions for use viability gap grant for market development are: (i) The enterprise must utilize the grant over a two (2) year period; (ii) the costed time of the enterprise's staff members are not an eligible as part of the enterprises contribution;</p> | <p>Women entrepreneurs will be encouraged to apply for grants and HortLangSon will support them with their applications. District based small agribusinesses will be encouraged to apply for the grants of up \$30,000. Women will also be encouraged to apply for small grants to develop village based enterprises that provide services linked to value chain activities or are value adding</p> |

| Conditions Item | Note |
|---|---|
| <p>(iii) The enterprise will prepare a market development proposal as part of its marketing plan. The marketing plan must feature the market development potential based upon reliable well researched market data; (iv) market development funding from the project must not be used concurrently with any market development funding provided by the Lang Son provincial government.</p> <p>Note: Innovative applied research is also encouraged under an Enterprise Viability Gap Grant.</p> <p>Additional conditions for use viability gap grant for innovation applied research development are: (i) The enterprise must utilize the grant within a one (1) year period; (ii) The innovation applied research proposal must clearly demonstrate benefits through at least one of following: increased product quality, greater processing efficiency and throughput, and new product development that will increase the viability of the enterprise through increased market opportunities and higher product prices; (iii) the innovative applied research must be undertaken by a registered competent entity (that has no joint ownership with the enterprise applicant) and formalised by an output based contract; (iv) State-owned-enterprises, and government research institutes may be contracted for innovation research if they are legally and financially autonomous, operate under commercial law, and are not dependent agencies of the borrower or sub-borrower; (v) the innovation applied research proposal must include evidence of supply agreements with producer groups and details of how increased product prices will be shared with the producer group members.</p> | |
| 3. Small Enterprise Viability Gap Grants | |
| <p>Purpose: to assist the smaller value chains enterprises that face challenges accessing credit for investment in value adding equipment, market development, and for working capital.</p> <p>Grant Amount: Grants from \$5,000 up to \$30,000. Only one grant per business entity allowed over the life of the project.</p> <p>Conditions: (i) Investor to provide at least 20% of the total planned investment; (ii) Viable business plan that includes: (a) five (5) year financial projections that confirm the financial viability of the proposed investment and demonstrates the investment propositions contribution to the increased profitability of the business; (b) all sources of finance for the proposed investment, including evidence of the investor's cash resources such as bank letter or other formally recognised documents; (c) financial profit and loss and balance sheet statements for at least the previous three (3) years (must be certified by a competent district authority -if not audited); (iii) market plan for the investors product(s) that includes a well researched market analysis with evidence to support price and market sale assumptions; (vi) Investor must be a member of a formal Product group formed under the project, and the proposal must clearly demonstrate how the investment will contribute to enhancing value chain performance through supply logistics and management, quality assurance, value addition, and forwards and backwards linkages.</p> <p>Where viability gap grants are used for market development the</p> | <p>Women entrepreneurs will be encouraged to apply for the small enterprise viability gap grants and HortLangSon will support them with their applications.</p> <p>Women will also be encouraged to apply for small grants to develop village based enterprises that provide services linked to value chain activities or are value adding.</p> |

| Conditions Item | Note |
|---|---|
| <p>following additional conditions apply: (i) the costed time of the enterprise's staff member(s) are not an eligible cost as part of the enterprise's contribution; (ii) The enterprise will prepare a realistic market development proposal as part of its marketing plan. The marketing plan must feature the market development potential based upon reliable market data, and; (iii) market development funding from the project must not be used concurrently with any market development funding provided by the Lang Son provincial government.</p> | |
| Producer Group Grants | |
| <p>General: Producer groups grants will initially be made to star anise and safe vegetable producer groups as detailed below. From Project Year 3 onwards Producer Groups grants will also be made to groups associated with other products. HortLangSon will prepare the grant conditions for these groups for approval by the PMU.</p> <p>Conditions: (i) All Producer Group grants will be provided as Block Grants; (ii) The total amount of the Block Grant allocation will be: (a) up to a limit of \$50,000 per group or; (b) for groups of less than 10 members the allocation will be up to a limit of \$5,000 per member (one household counts as one group member); (iii) The total amount of the Block Grant allocation to each producer group will be determined by the feasibility and profitability of the business proposition in the group's five (5) year business plan. The business plan must include: the production activity with outputs, financial budget for the planned activity showing profitability, investment plan, marketing plan and analysis, and risk analysis (see Manual Section V B for more details); (iv) The producer group must have a market supply agreement (this may be a formal supply contract) with a business that is included in the Product Group's Development Plan. For the safe vegetable groups this will be a contract or supply agreement with a safe vegetable retailer. Contracts and supply agreements must specify minimum quality assurance standards. The Viet Nam based businesses that have market agreements with the producer groups must be members of the relevant Product Association. (v) Each group's investment plan will detail the expenditure upon the approved items (see below for approved items for approved star anise and safe vegetable producer group investments). The business plan (with production and marketing plan) will present the business case for use of the investment funds. There is flexibility over the amount of expenditure allocated in the investment plan for any of the items on the approved list. Approval of the group's investment application will be made by the PMU based upon the HortLangSon recommendation. See Section Manual section VI B for more information; (vi) Producer groups must either be a registered cooperative or formally approved by the Commune People's Committee (To Hop tac); (vii) Each producer groups must have a bank account with at least two authorized signatories. Project funds for procurement of the approved items must be deposited in the group's bank account; (viii) Where the producer group does not comply with the above regulations after one year operations the items granted under the project may be recovered; (viii) The producer group grant is a once only grant. The Producer Group will</p> | <p>Farmer groups have a requirement for women membership. Minimum formal membership by women must be 50%.</p> |

| Conditions Item | Note |
|--|--|
| be responsible for managing their own capital to fund subsequent farm investments, including operating capital, once the grant funds are fully utilized. | |
| Star Anise Producer Group | |
| <p>Total Block Grant funding package per Producer Group up to a limit of \$50,000 per group. Eligible expenditure categories are:</p> <ul style="list-style-type: none"> • Group formation legal fees, registration • Feeder roads (based upon New Rural Development standards) • Harvesting equipment, ropes and systems for high harvesting and transport etc. • Contracted technical advisory services • Star anise inputs- fertilizer, agrichemicals, etc. | <p>Feeder road specification Pedestrian crossing roads mainly serve the movement of people between population groups, households and from home to upland fields, fields, production facilities, small livestock ... Transportation on routes are mainly bicycles, motorized two-wheelers, rickshaws, horse-drawn carts Category D: 2.0 m bed width and pavement of 1.5m width</p> |
| Safe Vegetable Producer Group | |
| <p>Total Block Grant funding package per farmer group up to a limit of \$50,000 per group, or \$5,000 per member (one house hold is a member) where the number of group members is less than 10. Eligible categories are:</p> <ul style="list-style-type: none"> • Group formation legal fees, registration etc. • Feeder roads (based upon New Rural Development standards) • Irrigation pumps, storage tanks and hoses and nozzles for trickle system • Shade houses • Vegetable production inputs- seeds, fertilizer etc. • Contracted technical advisory services <p>Conditions of Use: (i) Producer groups must use shade houses and irrigation equipment on a shared group basis – individual farmers are not permitted to have exclusive use of either a project funded shade house, or irrigation equipment; (ii) Producer group investment funds are not permitted to be used for upgrading of commune irrigation canals.</p> | <p>Feeder road specification Pedestrian crossing roads mainly serve the movement of people between population groups, households and from home to upland fields, fields, production facilities, small livestock, etc. Transportation on routes are mainly bicycles, motorized two-wheelers, rickshaws, horse-drawn carts Category D: 2.0 m bed width and pavement of 1.5m width</p> |

Appendix 3: Scope of Service and Terms of Reference: Agribusiness Contract Implementation and Supervision Management

A. Scope of Services

494. The contracted Agribusiness Contract Implementation and Supervision Management service provider will be responsible for provision of the following services:

- (i) Oversee the establishment of HortLangSon as an Industry Organization including its role and functions, constitution and mandate, Board guidelines, and defined Secretariat operational functions;
- (ii) Initially fill the Secretariat role and guide the HortLangSon operations;
- (iii) In the Secretariat role prepare a Horticultural Sector Strategic and Market plan;
- (iv) Assist sector members to form separate product groups based around the main commodities (for smaller sub sectors some groups maybe a combination). The first product group to be formed will be based upon the current Star Anise Association;
- (v) Advise and assist the PMU to establish the Competitive funding mechanism that will be basis for the Project's Competitive funding grants. Manage the grant funding mechanism for the HortLangSon Board;
- (vi) Establish the HortLangSon Trade, Markets and Quality information system service to support sector members;
- (vii) Initiate the development of quality assurance systems for the various Product value chains focused on quality standards and traceability. The star anise and vegetable value chains will be the priority quality assurance systems established;
- (viii) Prepare and implement a sector outreach and education program aimed at enhancing the knowledge and awareness of sector product group members about issues influencing the development of the sector. An on-going education program will be based upon the priorities identified in the sector strategic plan;
- (ix) Design and implement a system to monitor and assess sector performance. Note: this is not the usual project M&E system – it is a system to better monitor the key features of the horticultural sector to assist HortLangSon more effectively manage the sector, and will feature gender disaggregated data;
- (x) Following the successful establishment of HortLangSon and the Secretariat functions commence the program to develop the two exemplar value chains: star anise and vegetables;
- (xi) Implement the star anise and vegetables value chain developments following the Project guideline and regulations as outlined in the PAM;
- (xii) Ensure that an inclusive approach is followed that ensures that the high proportion of ethnic minority sector stakeholders, and women, have equitable access to the Project's resources and support programs;
- (xiii) Once the star anise and vegetable value chains have been successfully established assist HortLangSon to identify the next value chains that the Project will assist;
- (xiv) Assist the HortLangSon secretariat to implement the next value chains following the Project guideline and regulations;
- (xv) After two years of contract management services assist the HortLangSon Board to recruit permanent Secretariat staff members and provide the required capacity development program for the new staff.

B. Qualifications and Experience

- (i) The Agribusiness Contract Implementation and Supervision Management service provider will have the following qualifications and experience:
- (ii) Minimum of three staff with post graduate qualifications in agribusiness and value chains, horticultural production, agricultural marketing, or agro food quality assurance systems;
- (iii) Proven record of assistance to agribusinesses and the agribusiness sector in Viet Nam;
- (iv) Demonstrated experience in the management and implementation of commercial horticultural value chain projects for export and national markets. Including the provision of technical support to small holder women and men farmers;
- (v) Demonstrated expertise in the implementation of internationally recognized agro-food quality assurance systems and traceability for export and national markets;
- (vi) Demonstrated experience in providing institutional development and capacity building services to agribusinesses and horticultural and agricultural sector organizations in Viet Nam and the GMS region;
- (vii) Demonstrated experience of implementing agribusiness projects with ethnic minorities and projects that have focused on enhancing women's business and production participation in all value chain stages;
- (viii) Demonstrated high quality communications expertise and proven experience with the development of sector performance management systems.

C. Terms of Reference

495. Terms of reference for the Agribusiness Contract Implementation and Supervision Management service provider team positions are presented below.

1. Team Leader/ Agricultural Marketing and Value Chain Expert

496. Main Tasks:

- (i) Provide team leadership to the service provider team, working closely with the HortLangSon Interim Board and in close liaison with the PMU. Establish working relationships with the main Lang Son government departments involved in the horticultural sector;
- (ii) Initiate the establishment of HortLangSon, including assisting the PMU with the appointment of the Interim Board, and initiate sector stakeholder engagement;
- (iii) Act as the HortLangSon Chief Executive Officer for the first two to three years of the project. Assist the Interim Board to recruit a substantive Chief Executive Officer during the third year of the project and subsequently mentor the Chief Executive Officer and other appointed HortLangson staff;
- (iv) As the interim HortLangSon Chief Executive Officer lead the HortLangSon and the Output 3 project interventions and operations;
- (v) In conjunction with the specialist members of the team establish of the HortLangSon core service functions: Trade and Market Logistics; Quality Assurance and Compliance, and; Information and Outreach.
- (vi) Manage the preparation of the HortLangSon first business plan, the horticulture sector strategy and the associated market studies for star anise and safe vegetables;
- (vii) Guide the development of the two representative value chain interventions for star anise and safe vegetables;

- (viii) Guide the implementation of capacity development program for HortLangSon staff (once appointed), Product groups and agribusiness sector members, Producer Groups members and departmental staff;
- (ix) Ensure that a suitable and compliant financial management and recording system is established for HortLangSon and the associated Output 3 activities. The HortLangSon board and the PMU will be provided with monthly financial reports and also with monthly fund forecasts;
- (x) Prepare six monthly project reports for the HortLangSon Board and the PMU.

2. Post-Harvest Systems and Value Chain Expert

497. Main Tasks:

- (i) Coordinate with the Team Leader Team Leader/ Agricultural Marketing and Value Chain Expert over the project's support to improve post-harvest systems in the horticulture sector;
- (ii) Review the post-harvest practice by the Producer Groups for both star anise and vegetables. Propose how the farmer group level post-harvest practice can be improved, and initiate a program to achieve better practice;
- (iii) Undertake a review of the star anise collectors, traders, processors and marketers to fully assess their post-harvest practice. Based upon this assessment, in association with the Quality Assurance and Compliance Systems Expert, propose how post-harvest practice can be enhanced with the support of the project;
- (iv) Based upon the star anise assessment develop an information and capacity development program for the star anise value chain members to enhance post-harvest practice;
- (v) Undertake a post-harvest assessment for the safe vegetable value chain. Based upon this assessment, in association with the Quality Assurance and Compliance Systems Expert, propose how post-harvest practice can be enhanced with the support of the project.
- (vi) Develop a series of post-harvest training modules for use by the sector members from farmers to processor and marketers, as well as departmental and also extension staff;
- (vii) Institute post-harvest systems skills and knowledge into the service functions of HortLangSon, including mentoring of HortLangSon staff (once appointed).

3. Markets and Trade Logistics Expert

498. Main Tasks:

- (i) Assess the status of market and trade data provided to the horticultural sector members by the Department of Industry and Trade (DOIT) and other government departments. Prepare a plan for the HortLangSon role in the provision of this data to sector members, and manage the development of this service – ensure there is regular liaison with the DOIT;
- (ii) Undertake the market analysis for star anise and safe vegetables as part of the horticultural sector strategic assessment. Using the findings from the market assessments assist with the preparation of the business plans for value chain agribusinesses and also Producer Groups. This task will be undertaken in coordination with the Financing and Grant Management Expert, and Agricultural Producer Groups and Market Linkage Expert.

- (iii) Initiate the market grant program through Product Group meetings (star anise and safe vegetables in the initial stages of the project) and other information dissemination methods (in association with the Information Systems and Outreach Expert).
- (iv) Assist the sector agribusinesses to fully utilize market and trade logistics data in their business plans. Assisting and advising the star anise agribusinesses should be a high priority over the first two years of the project;
- (v) In association with the DOIT and the provincial statistics office strengthen the gathering of data on horticulture sector economic performance including the export of horticultural products;
- (vi) Develop a series of market and trade training modules for use by the sector members from farmers to processor and marketers, as well as departmental and also extension staff. Assist in training program delivery;
- (vii) Institute the HortLangSon Market and Trade Logistics service function for the horticultural sector, including mentoring of HortLangSon staff (once appointed).

4. Quality Assurance and Compliance Systems

499. Main Tasks:

- (i) Assess the status of quality assurance and compliance systems in the horticultural sector. The initial focus will be upon star anise and safe vegetables. These assessments may be undertaken in conjunction with the Post-harvest Systems and Value Chain Expert;
- (ii) Based upon the quality assurance and compliance systems assessment prepare a plan for the HortLangSon role in quality assurance and compliance systems assessment development in the horticultural sector;
- (iii) Initiate the HortLangSon quality assurance and compliance systems program for the sector. The initial emphasis will be upon star anise with a particular focus upon export markets. Vegetables will also be an early priority. As the various Product Groups are formed provide regular quality assurance and compliance systems information the members (in association with the Information Systems and Outreach Expert);
- (iv) Assist and advise horticultural sector agribusinesses to implement enhanced quality assurance and compliance systems;
- (v) Institute the HortLangSon quality assurance and compliance systems core service function for the horticultural sector, including mentoring of HortLangSon staff (once appointed);
- (vi) Develop a series of quality assurance and compliance training modules for use by the sector members from farmers to processor and marketers, as well as departmental and also extension staff. Assist in training program delivery
- (vii) Ensure that there is a close working relationship established with the provincial and national departments responsible for state management quality assurance and compliance systems functions, this includes Department of Science and Technology (DOST) and Department of Agriculture and Rural Development (DARD).

5. Financing and Grant Management Expert

500. Main Tasks:

- (i) Develop an information program (in association with the Information Systems and Outreach Expert) to make horticultural sector members of the Project's grant funding program. Star anise and safe vegetable sector members will be initially the targets of the information program;
- (ii) Prepare the grant funding application formats based upon the information in the Management Implementation Manual;
- (iii) Develop the criteria for the assessment and approval of the grant applications. Provide training and guidance to the various groups that will be responsible for assessing and approving the grant applications;
- (iv) Assist and advise the value chain agribusinesses in the preparation of business plans – the business plans are the basis to support their grant application (this task will be coordinated with other team members);
- (v) Assist with the Agricultural Producer Groups and Market Linkage Expert with the development of the Block Grant program;
- (vi) Assist the Markets and Trade Logistics Expert with the marketing grant program.
- (vii) Manage the preparation for, and implementation of, the innovations grant program. Preparation will include sector consultation to determine the how the innovation grants can be most effectively applied. The initial focus will be upon star anise and the potential for innovations to support star anise product development and processing;
- (viii) Monitor the agribusinesses and Producer Groups that have received grants and, if necessary, propose how the grant mechanism including investment amount and conditions for use of funds may be improved.

6. Information Systems and Outreach Expert

501. Main Tasks:

- (i) Initiate the development of the HortLangSon information and horticultural sector outreach program;
- (ii) Assist the Team Leader with the initial sector stakeholders meetings linked to the establishment of HortLangSon and the appointment of the Interim Board;
- (iii) In association with the Markets and Trade Logistics Expert, the Quality Assurance and Compliance Systems Expert and the Post-harvest Systems and Value Chain Expert develop the HortLangSon information systems to provide sector members with regular and reliable market, trade and quality assurance information;
- (iv) Assist the Team Leader with the formation of the Product groups and initiate a program for regular engagement with the various Product Groups (once they are formed) and provide information based upon their demands and needs;
- (v) Investigate the most effective and efficient method(s) to disseminate information to the horticulture sector. Implement a regular outreach program based upon the findings. The HortLangSon (and Project) outreach program must ensure that both women and male horticultural sector members are provided with information, and that the outreach activities ensure that low literacy and non-kinh speakers are able to access the information provided by HortLangSon;
- (vi) Assist the team leader to guide the implementation of capacity development program for HortLangSon staff (once appointed), Product groups and agribusiness sector members, Producer Groups members and departmental staff
- (vii) Institute the HortLangSon Information Systems and Outreach core service function for the horticultural sector and mentor HortLangSon staff (once appointed) to take over the Information Systems and Outreach role.

7. Agricultural Producer Groups and Market Linkages Expert

502. Main Tasks:

- (i) Lead the process to form the various Product Groups and assist them to become functional groups representing their producers (in association with the Team Leader and Information Systems and Outreach Expert). The first Product Group will be for star anise and based upon the Star Anise Association. The second group will be the safe vegetables Product Group.
- (ii) Lead the program to establish the Producer Groups and assist them to become operational groups. The star anise groups will be the first producer groups to be assisted. The safe vegetable groups will also be assisted as part of the project's support for the first two representative value chains. Ensure that the formation of the groups complies with the project regulations, including the gender requirements;
- (iii) Assist the producer groups to become formally registered entities, and to prepare a business plan for their production and marketing activities. The business plan will include the utilization of the Block Grant funds. Note: the producer group must have an approved business plan to be eligible for project financial support;
- (iv) Assist the Producer Groups to establish market linkages with retailers, processors or other value chain actors. Note: the producer group must have a formal market relationship to be eligible for project block grant support;
- (v) Assist the Producer Groups to implement their business plans and use of the block grant funds;
- (vi) Develop a program of technical support for the Producer Groups aimed at producing high quality safe fruit and vegetables. Oversee the extension services to assist the farmer including the capacity development of district and commune extension services;
- (vii) Oversee the monitoring of Producer Group performance and provide assistance as required. Project support must focus on market relationships, business plan implementation, group operational effectiveness, as well as crop production;
- (viii) Mentor HortLangSon staff (once appointed) to take over the Agricultural Producer Groups and Market Linkage role.

Appendix 4: Sector Transformation Group Terms of Reference

503. Purpose: to ensure that there is a strategic coordinated approach to planning of the development of the horticultural sector that is based upon the PPC's strategies and policies for horticultural sector development and involves all the key government stakeholder departments, HortLangSon, and the Lang Son Business Association.

504. The Sector Transformation Group will be responsible to the PPC to:

- (i) Provide strategic advice to HortLangSon board for sector transformation;
- (ii) Ensure that horticulture sector plans are aligned with the SEDP sector development strategy;
- (iii) Ensure that investment is encouraged in the sector from provincial businesses and outside investors;
- (iv) Advise on policies to encourage sector investment are identified and promoted;
- (v) Ensure that annual departmental plans for the horticultural sector are aligned with the HortLangSon annual plan;
- (vi) Ensure that implementation of departmental and HortLangSon plans for the sector are coordinated and demonstrate efficient use of resources to achieve sector objectives and targets set by PPC;
- (vii) Ensure that sector services provided by the Departments are rationalised and integrated with HortLangSon services to achieve higher quality and cost effective services for the sector.

505. Membership: will consist of the following:

- (i) PPC Vice Chair responsible for the BIIG 1 Project;
- (ii) DOIT leaders responsible for horticulture sector planning and sector services (up to 2 staff);
- (iii) DARD leaders responsible for horticulture sector planning and sector services (up to 3 staff);
- (iv) DOST leaders responsible for horticulture sector technical and research services (up to 2 staff);
- (v) DPI leaders responsible for SEDP and annual planning and for investment planning, plus the PPMU Director (up to 3 staff);
- (vi) HortLangSon Chief Executive Officer;
- (vii) Lang Son Business Association (at least 2 members)
- (viii) DoF leader responsible for horticultural (agricultural) sector financial management (one staff).

506. The group will meet twice yearly or more often if the PPC requires:

- (i) October - to discuss coordinated and integrated horticultural sector annual planning coordination for the upcoming year;
- (ii) March – to finalize the implementation of the integrated coordinated plan for horticultural sector development and service delivery.

507. Main Tasks:

- (i) Planning and Review (October)
- (ii) Achievement of PPC sector development strategies and priorities reviewed
- (iii) Assess sector performance and identify opportunities and areas for improvement
- (iv) HortLangSon annual plan – investment and services delivered and discussed;

- (v) Present and review each departments plan – any sector investments and service delivery;
- (vi) Identify where the departments can contribute to the HortLangSon annual plan;
- (vii) Identify any overlap and inefficient resource use between departments and HortLangSon services;
- (viii) Agreement to revise plans (if necessary) to ensure efficient resource use and avoid overlap.

508. Implementation (March)

- (i) Revised approved plans reviewed;
- (ii) Any further overlap or inefficient resource use identified and actioned;
- (iii) Coordination plan agreed and approved.

509. **Note:** Coordination of plans and activities will occur at the operational level and this will be achieved through regular meetings between HortLangSon and the respective departments.

ANNEX H: GUIDELINES FOR INCORPORATING CLIMATE CHANGE RISK IN THE DETAILED ENGINEERING DESIGN OF ROAD SUBPROJECTS

ABBREVIATIONS

| | | |
|---------------------|---|---|
| ADB | : | Asian Development Bank |
| amsl | : | Above mean sea level |
| BIIG | : | Basic Infrastructure for Inclusive Growth |
| CC | : | Climate Change |
| CCA | : | Climate change adaptation |
| cm | : | Centimeter |
| CMIP | : | Coupled Model Intercomparison Project |
| CO ₂ | : | Carbon Dioxide |
| CRVA | : | Climate Risk and Vulnerability Assessment |
| CSIRO | : | Commonwealth Scientific and Industrial Research Organisation |
| DED | : | Detailed design and engineering |
| dia | : | Diameter |
| DPI | : | Department of Planning and Investment |
| EA | : | Executing Agency |
| EARF | : | Environmental Assessment and Review Framework |
| EVA | : | Extreme Value Analysis |
| GCM | : | Global Climate Model |
| GEV | : | Generalized Extreme Value probability distribution |
| GHG | : | Greenhouse gas |
| IMHEN | : | Institute of Meteorology, Hydrology and Environment of Vietnam |
| IPCC | : | Inter-Governmental Panel on Climate Change |
| m | : | Meter |
| mm | : | Millimeter |
| m ³ /sec | : | Cubic Meters Per Second |
| MoNRE | : | Ministry of Natural Resources and Environment |
| MoST | : | Ministry of Science and Technology |
| NTP | : | National Target Program to Respond to Climate Change |
| PDF | : | Probability Distribution Function |
| PPC | : | Provincial People's Committee |
| PPMU | : | Provincial Project Management Unit |
| PPTA | : | Project Preparation Technical Assistance |
| PRECIS | : | Providing Regional Climates for Impacts Studies (climate model) |
| RCM | : | Regional Climate Model |
| RCP | : | Representative Concentration Pathway |
| SLR | : | Sea Level Rise |
| SRES | : | IPCC Special Report on Emission Scenarios |
| TCVN | : | Vietnam National Design Standard |
| W/m ² | : | Watts per square meter |
| WMO | : | World Meteorological Organization |

SUMMARY

510. The Basic Infrastructure for Inclusive Growth Projects will be implemented in eight provinces in the north-eastern and north-central sub-regions of Vietnam (BIIG-1 and BIIG-2, respectively).³² They are to be executed by each Provincial People's Committee (PPC) as Executing Agency, with their respective Departments of Investment and Planning (DPI) designated as project owners. The expected outcome is improved subregional competitiveness through increased productivity, services delivery, and movement of goods and people.

511. Using ADB's sector project modality, representative subprojects from the range of different types of infrastructure were selected during project preparation to establish the feasibility of proposed investments using a preliminary design and cost estimate. The feasibility test includes an assessment of climate risk and vulnerability of the representative subprojects.

512. The climate risk assessment identified the roads and bridges as vulnerable infrastructure elements due to increased flood risk. The assessment recommends that detailed engineering designs incorporate increased flooding risk due to climate change. The following report describes an approach for including climate change in the detailed design of roads and associated structures.

513. These guidelines serve two purposes. First, they provide background understanding on the rationale for re-assessing design flood levels to consider climate change impacts based on climate modeling projections. Second, described here are steps to guide DED practitioners in adjusting design flood levels.

514. Government road design standards specify the estimation of design flood levels based on a frequency of occurrence (return period). These are set according to the road category and type of structure, both of which reflect local site conditions and forecast traffic volumes. The estimated design flood level then determines the road embankment elevations, road drainage provisions, and vertical clearance of bridge decks.

515. The following guidelines do not change the existing national standards. The objective, rather, is to provide a cost-effective option to adjust design flood levels using existing design frequencies and hydrological formulas— by *moving historical climate records in setting input parameters to the formulas and models to using projected climate records inclusive of climate change*. Scientific climate change projections need to be factored into the design process.

516. Climate modeling data for the RCP 8.5 scenario is used for deriving the climate change projections.³³ This scenario represents the most conservative³⁴ assumptions on limiting future global greenhouse gas emissions. RCP scenarios diverge in their projected atmospheric CO₂ concentrations beginning about 2040s. For the proposed BIIG-1 and BIIG-2 infrastructure design economic life is up to the mid 2030's, for which projected climate change should be consistent across RCP scenarios. However, a review of projected data found some inconsistency in the RCP 4.5 scenario data relative to the other scenarios. Taking this

³² BIIG-1 covers four North-Eastern provinces of Bac Kan, Cao Bang, Ha Giang and Lang Son; BIIG-2 covers four North-Central provinces of Ha Tinh, Nghe An, Quang Binh, and Quang Tri.

³³ Representative Concentration Pathways (RCPs) reflect the degree to which GHG emissions are actively mitigated, stabilized or increased. The four RCP scenarios are identified by their total "radiative forcing", which is the difference between solar energy absorbed by the Earth and the energy radiated back to space. It is measured in watts per square meter (W/m²) projected in year 2100 relative to 1750.

³⁴ Conservative in the sense that this scenario assumes there may not be much success in curtailing global greenhouse gas emissions over the coming decades.

inconsistency into account, and considering the risk mitigation objective of the guidelines, the RCP 8.5 climate change projections were applied.

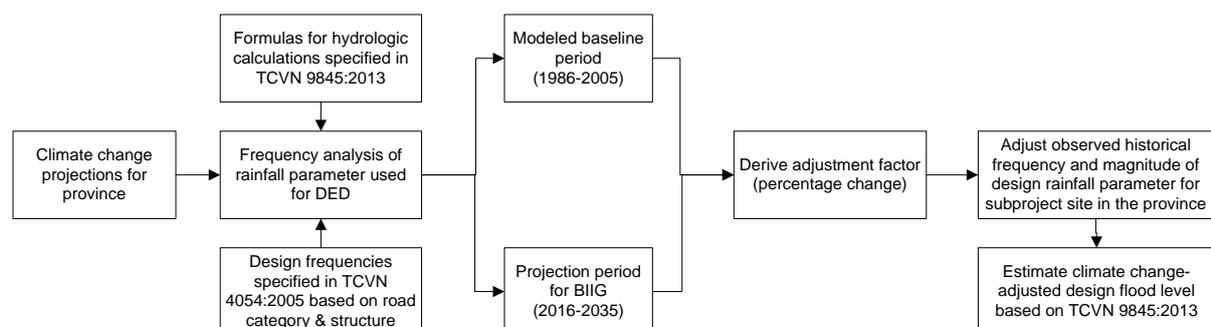
517. Projections indicate that future rainfall intensities are likely to increase. In the BIIG provinces, model-derived projections indicate significant increases in extreme rainfall especially for BIIG1 provinces. The risk of relying on unadjusted historical rainfall for design purposes is that the structures would likely be under-designed and vulnerable to frequent disruption and damage during operation. Managing this risk is now a priority in the Government's transport sector policy framework.

518. Design rainfall adjustments presented in part one of these guidelines are for road component structures with design frequencies set at a return period of 25 years or less. For larger structures with design frequencies involving 50 or 100-year return periods (e.g., large bridges), adjustments are necessary though this may require different estimation approaches involving more complex hydrodynamic modelling solutions. An approach for dealing with such structures will be added as Part 2 of these guidelines for inclusion in the BIIG1 and 2 Project Administration Manual.

519. The two most important sets of national standards relevant to the engineering design of roads and bridges are TCVN 4054:2005 and TCVN 9845:2013. The former applies to the design of roads and highways in general, including new construction and rehabilitation of existing roads. Its scope also includes both urban roads and rural roads. The most important aspect of this standard is that it specifies the design frequency (return period) to be used in estimating design flood levels, depending on the road classification and the type of component structure.

520. TCVN 9845:2013, on the other hand, specifies procedures and formulas for hydrologic calculations used to determine the level of road embankments, drainage specifications and clearance of bridges above the design flood level. The formulas are based on the one-day maximum rainfall intensity. After the design frequency for a structure has been determined with reference to TCVN 4054:2005, the hydrologic calculations based on that frequency are done with reference to formulas specified in TCVN 9845:2013.

521. These guidelines develop, for the required design frequency levels up to P4 specified in the national standard, estimates of daily maximum rainfall for the historical baseline and for the period to 2035 that uses climate change projections. This data is then applied to generate the expected flood levels and design requirements. Steps for carrying out such adjustment are described in the guidelines. The framework is shown below.



522. Statistical modeling using extreme value analysis was applied to derive design rainfall adjustment factors for each BIIG province. The frequency analysis used the Generalized Extreme Value (GEV) probability distribution function, which showed the best fit to the data for the BIIG provinces.

523. Following the method above, annual one-day maximum rainfall data were extracted from the climate model baseline³⁵ simulation and the climate projection for each province. The *one-day maximum rainfall* estimated at various frequency levels (using the fitted probability distribution) were compared between the two periods. For any given design frequency, rainfall values corresponding to the modeled baseline and the projection period were then used to calculate *percentage changes* (adjustment factors). The results then used to adjust the actual *historical* rainfall values derived from observation data applicable to a specific subproject site. Adjustment factors derived for each province are provided in the guidelines.

524. To illustrate use of the guidelines, adjusted extreme daily rainfalls were applied to three representative subprojects to assess the extent of modification required—that is, to compare with the unadjusted conventional design using only historical rainfall data. The cases were selected to represent the range of road categories and terrain among the BIIG subprojects. The impact on the design of using one-day maximum rainfall adjusted for climate change are summarized below:

- An increase of 0.81 to 0.87 meter in water elevation at 5 small bridge locations for the Dinh Son – Anh Son mountain road in Nghe An province. The dimensions of 6 of the 25 culvert locations were increased based on the adjusted design flows. For example, at a stream located at Km2+759 the flow increased from 5.17 to 7.37 m³/sec, with the dimensions of the proposed slab culvert increasing from 150 x 150 cm to 200 x 200 cm.
- For the Bao Ninh – Hai Ninh coastal road in Quang Binh province, the P4 design flows at two culvert sections increase by around 34% after adjusting the P4 value derived from historical record. The flood water elevations increased by 0.5 to 0.6 meter, requiring both an increase of culvert size and a need to raise the height of the road embankment.

525. For the Boc Bo - Bang Thanh - Son Lo Road in Bac Kan province, the design flood flow at 4 small bridge locations increased by 36% to 119%. Flood water elevations at P4 frequency increased by 0.2 to 2.26 meters after adjustment.

³⁵ The term “baseline climate” is used to refer to the modeling simulation of the past climate, while the term “historical climate” is used to refer to the real climate as observed in the past by monitoring stations.

I. INTRODUCTION

A. Background

526. The two Basic Infrastructure for Inclusive Growth (BIIG) Sector Projects include BIIG-1 in four north-eastern provinces (Bac Kan, Cao Bang, Ha Giang and Lang Son) and BIIG-2 in four north-central provinces (Ha Tinh, Nghe An, Quang Binh and Quang Tri). The Projects' Executing Agency will be the Provincial People's Committee with their Departments of Investment and Planning (DPI) designated Project Owners.

527. The projects' expected outcome is to enhance opportunities for inclusive economic growth through improved transport infrastructure (roads and bridges), improved services (water supply, agricultural productivity), and professionally managed provincial infrastructure. Using ADB's sector project modality, representative subprojects were used to assess each Project's feasibility during project preparation. A climate risk and vulnerability assessment (CRVA) examined the likely effects of climate change on the representative subprojects based on their preliminary engineering designs.³⁶ Findings identify roads and their structures such as bridges to be the most vulnerable due to projected increased intensity of rainfall leading to increased flood water levels.

528. Climate change is not explicitly included in Vietnam's engineering design standards for roads and bridges. The standards include hydrologic calculations of the design flood levels that are then used to inform the design. The existing standards provide engineering formulas wherein rainfall intensity is a key input that can potentially be adjusted for climate change impacts on flood levels. The following guidelines provide an approach and estimates for adjusting the design rainfall intensity at various frequencies or return periods corresponding to the road classification and type of structure.

529. Design flood levels, determined from hydrologic calculations based on peak rainfall, are used for the technical specifications of road component structures including drainage and bridges. The one-day maximum rainfall is used as a key determinant of flood levels for a specified frequency of occurrence (i.e., equivalent to return period). The frequency of occurrence is specified in Government regulation TCVN 4054:2005 for differing categories of roads and for differing bridges sizes. The design flood levels are then used to determine road level/elevation, road drainage provisions, and vertical clearance of bridge decks above the floodwater level. Currently historical daily maximum rainfall data is applied to estimate the design flood levels for each frequency or return period specified.

530. Overall, climate change scenarios future extreme rainfall events are projected to increase in magnitude for any specified frequency or return-period.³⁷ Reliance on historical rainfall and past flood events will therefore increasingly underestimate future flood levels. The risk of using solely historical data for engineering design purposes to estimate flood levels is that the resultant structures may be increasingly vulnerable to recurrent damage or the increased potential for some structures to fail.

531. These guidelines provide a method for reducing these risks by applying climate change-adjusted rainfall projections within the hydrological formulas used to estimate future (frequency-based) peak flows and flood levels. The underlying set of design standards do not

³⁶ The CRVA was framed to answer: (i) what climate parameters are critical to infrastructure performance and durability? (ii) how are these critical climate parameters projected to change over the project life? (iii) are existing/similar assets already being affected by increasing climate variability and extremes? (iv) what non-climate factors aggravate or mitigate climate change impacts (v) how vulnerable is the infrastructure? (vi) what measures should be incorporated in the detailed design of the subproject?

³⁷ An equivalent statement is that the frequency or return period will be shorter for any given extreme rainfall magnitude.

require change the guidelines simply adjust the required input data to maximum daily rainfall expected by mid-century.

a. Purpose and scope of guidelines

532. The following report serves two purposes. The first part provides the rationale for adjusting design flood estimates based on climate modeling projections produced by MoNRE.³⁸ The second part describe steps that DED practitioners can apply to adjust design flood levels for climate change based on design frequencies and hydrological formulas specified in existing national standards.

533. Annex A presents the climate modeling for Viet Nam, and Annex B summarizes the projections for Vietnam. Annex C presents formulas specified for estimating the design flood. Annex D gives details on the extreme value analysis method used to derive rainfall adjustment factors. Annex F gives results of recalculating the engineering specifications of road component structures using climate change-adjusted rainfall applied to 3 case study subprojects. Annex G gives an overview of hydrological modeling, which is suited to designing structures requiring more extreme design frequencies (e.g., P1).

534. The guidelines apply current government standards which stipulate the design frequencies, depending on the road category and type of component structure,³⁹ for hydrological parameters (flood volume, water level and water velocity) used to determine the road embankment level, drainage system provisions, bridge clearances and structural supports, and allowable overflow depths on spillway crossings.

535. The objective of the guidelines is to provide a cost-effective means for adjusting design flood levels using existing design frequencies and hydrological formulas using forward projections rather than solely relying on historical climate records.

536. The scope of the design rainfall adjustment factors recommended in these guidelines is for road structures with design frequency levels set at a return period of 25 years or less (P4 to P10). For larger structures with design frequencies involving return periods of 50 years (P2) or 100 years (P1), such as large bridges, adjustments are necessary though this may require different estimation approaches involving more complex hydrodynamic modeling solutions or comparative analysis using similar watersheds.⁴⁰

II. Projected climate change in BIIG-1 and BIIG-2 provinces

a. Climate change modeling approach

537. The following section describes the climate change modeling studies used to obtain climate change projections at province level. Additional technical details are provided in Annex A. The rainfall adjustment factors provided in these guidelines are derived from analysis of model-generated climate change projections.

538. Global climate change models (GCMs) use greenhouse gas emission scenarios to project climate change in the medium to long term. These scenarios define alternative

³⁸ For brevity, only a summary of climate change projections is presented in the guidelines. Details are found in the CRVA report for each sub-region.

³⁹ The notation Px (e.g., P4) refers to an extreme weather event with x% probability of being equaled or exceeded in any one year. The corresponding return period or recurrence interval is the reciprocal of the exceedance probability.

⁴⁰ A future addition to the guidelines is planned to include adjustment for medium and large bridges, including use of appropriate hydro-dynamic models. An overview of such models is given in Annex G.

greenhouse gas (GHG) emission levels with typically four CO₂ atmospheric concentration trajectories reported for climate change policy known as Representative Concentration Pathways (RCPs). The projections from RCPs are then used as inputs to GCMs in generating climate change projections. GCMs simulate the processes and feedback loops between components of the climate system at global scale. GCMs typically model at low spatial resolutions (more than 200 km) due to computing requirements.⁴¹

539. The differing climate research institutions that develop and run these climate models use differing assumptions of the global climate system, resulting in differing climate projections for the same RCP scenario between models. The extent of agreement of the projected direction and magnitude of climate change across multiple models is considered indicative of the “robustness of projections”.

540. Global climate models continue to be improved and increasingly are capable of producing higher resolution projections⁴². Currently existing GCM outputs remain unreliable at sub-regional levels or below. Locations with rugged topography and elevation differences that strongly influence climate, as in the case of BIIG-1 north-eastern provinces, limit the direct use of existing GCM outputs. To increase the reliability of climate change impact assessments at sub-regional or provincial scale, higher-resolution climate change projections are needed to transform GCM output into local or regional projections.

541. Downscaling or “regionalization” produces higher-resolution climate projections derived from low-resolution GCM outputs at a *scale* of 50 km or less. Such downscaling provides a more precise representation of the effects of local geographic features, such as mountain topographies – increasing their applicability and reliability for local planning.

542. *Dynamical* and *statistical* downscaling methods are used. In dynamical downscaling, a regional climate model (e.g., PRECIS⁴³) is run for a delineated sub-region in which the boundary conditions are derived from a parent GCM. In statistical downscaling, analysis is based on statistical properties of the historical climate at observation stations that are correlated with gridded coarse-scale GCM baseline projections. (Refer to Appendix A for additional explanation on downscaling methods).

b. Viet Nam Climate Change Projections

543. Outputs from five regional climate models have been used by MoNRE’s Institute of Meteorology, Hydrology and Environment (IMHEN) to develop downscaled climate change projections for Vietnam.⁴⁴ Each of the five regional climate models used input data from the output of one or more low resolution or “parent” GCMs. Among the five regional climate models studied by MoNRE,⁴⁵ the output of the PRECIS regional climate model is considered the most reliable and was run using data from the CNRM-CM5, GFDL-CM3 and HadGEM2-ES GCM

⁴¹ A primer on how climate models work, based on expert consensus, is available at the website of the US National Research Council's Board on Atmospheric Sciences and Climate: <http://nas-sites.org/climate-change/climate-modeling>. For a more technical description, refer to Chapter 9 of the IPCC’s Assessment Report No. 5 (2013): Evaluation of Climate Models.

⁴² Improvements in climate modelling are heavily reliant on the computing power provided by supercomputers, such as the Earth Simulator in Japan.

⁴³ PRECIS was developed at the UK Met Office Hadley Centre with the purpose of enabling users in developing countries to easily produce detailed climate projections for any chosen region of the world.

⁴⁴ Ministry of Environment and Natural Resources. Climate Change and Sea Level Rise Scenarios for Vietnam. Hanoi, 2016. The summary report is in English; the full report in Vietnamese. Details of MoNRE’s 2016 climate change database and how it was set up are described in Annex A, which also provides a guide on interpreting the scenarios and modeling outputs.

⁴⁵ Referring to page 39 of the MoNRE climate change full report indicated that the results of rainfall calculations show differences between the models for climatic regions of Vietnam, and that the PRECIS model gave results that were judged more reliable compared with the other models.

models. The regional climate models produced three sets of high-resolution climate projections under each particular regional climate model.

544. For these guidelines, the output from the three GCMs downscaled using PRECIS are used to generate forecasts of future daily maximum rainfall at various frequencies under climate change conditions. These projections relative to the current baseline climate conditions are used to develop the adjustment factors.

545. MoNRE's database on downscaled climate projections for Viet Nam used two of the four RCP CO₂ concentration scenarios, namely: RCP 4.5 representing a CO₂ concentration pathway based on moderate levels of GHG emissions mitigation, and RCP 8.5 which represents the pathway without effective mitigation of future GHG emissions resulting in strong warming by the end of century.

546. In terms of projected atmospheric CO₂ concentrations, the RCP 4.5 and 8.5 scenarios differ little up to 2040. Thereafter, their projections diverge as emission levels under RCP 4.5 assumptions stabilize, emission levels under RCP 8.5 continue to increase. Given that the purpose is to mitigate risk of climate change by ensuring that infrastructure engineering design is resilient, these guidelines apply climate projections derived from RCP 8.5.

547. Data for each of the BIIG-1 and BIIG-2 provinces from the downscaled model projections for the annual maximum daily rainfall covering the (i) baseline (1986 to 2005), (ii) early century (2016 to 2035), and (iii) mid-century (2046 to 2065). These were used in the climate risk and vulnerability assessments up to mid-century for the two BIIG projects.

548. The need for climate change risk adjustment is demonstrated for the BIIG1 and 2 project provinces with the projected daily maximum rainfall compared to the current baselines rainfall levels – see Table 86. The annual daily maximum rainfall within the average of three PRECIS-downscaled GCMs⁴⁶ under the RCP 8.5 scenario to increase in all provinces with more intense wet season rainfall.

Table 86. Projected change in extreme rainfall in BIIG-1 and BIIG-2 provinces (%)

| Province | Annual max 1-day rainfall | | |
|------------|-------------------------------|----------------------------|----------------------------|
| | Baseline 1986-2005 (mm) | 2016-35 (% of baseline) | 2046-65 (% of baseline) |
| Bac Kan | 101 | +47 | +58 |
| Cao Bang | 92 | +41 | +58 |
| Ha Giang | 151 | 0 | +17 |
| Lang Son | 102 | +77 | +65 |
| Nghe An | 215 | +29 | +35 |
| Ha Tinh | 288 | +23 | +18 |
| Quang Binh | 207 | +21 | +26 |
| Quang Tri | 194 | +38 | +44 |

*zero means no change.

549. For these guidelines, the applicable period of analysis corresponds the economic life of BIIG-1 and BIIG-2 road infrastructure subprojects, which is up to the mid-2030's. Specifically, one-day maximum rainfall adjustment factors are derived to adjust baseline

⁴⁶ A modeling run refers to a downscaling application of PRECIS to a global climate model. In this study, PRECIS was used to downscale 3 GCMs: CNRM-CM5, GFDL-CM3 and HadGEM2-ES. The tabulated values are the average from the three modeling runs.

maximum one day rainfall for input to the design rainfall intensity in the TCVN-specified hydrological formulas for estimating design flood levels.

550. The considerable differences between provinces for projected change in rainfall intensity support the recommendations from a recent hydrological study (Doan Thi Noi, 2016⁴⁷) that question the use of the 18 climate sub-regions⁴⁸ specified in TCVN 9845:2013. The use of a limited number of climate sub-regions results removes the significant variance between provinces leading to design bias.

III. Viet Nam engineering design standards

a. Government-mandated engineering standards

551. The transport sector Climate Change Action Plan for the period 2016 to 2020, prepared by the Ministry of Transport (MoT, 2015) aims to continually assess the impact of climate change on the country's transportation system; identify suitable adaptation measures for transport construction works; and mobilize international resources to support the application the solutions to mitigate and adapt to climate change. In support of this plan, the MoT has issued supporting decisions to clarify objectives and pave the way for climate change impacts be addressed through improved road standards and specifications.⁴⁹ To date, no road-specific engineering design guidelines for climate change resilience have been issued.

552. In Vietnam, the Ministry of Science and Technology (MoST) is responsible for reviewing and approving national standards for application in various sectors. There are also sector-specific national standards, referred to as branch standards, such as those issued by MoT for the design of roads and bridges. Development of national standards is carried out by committees and working groups composed of technical experts and standards developers. After undergoing a series of draft preparation and review by stakeholders, the Ministry of Science and Technology exercises final authority to approve and issue the standard.

553. The two national standards relevant to the engineering design of roads and bridges are TCVN 4054:2005⁵⁰ and TCVN 9845:2013. The former applies to the design of roads and highways, including new construction and rehabilitation of existing roads. Its scope includes both urban and rural roads. Roads are categorized into classes based on expected traffic volumes.⁵¹ The standard specifies the design frequency (or return period) to be used in estimating design flood levels, depending on the classification of the road and the type of structures associated with it – see Table 87.

554. TCVN 9845:2013, specifies procedures and formulas for hydrologic calculations, which for roads are used to determine road embankment elevations, road drainage specifications and clearance of bridges above the design flood level. TCVN 9845:2013 is a consolidation of previous ministerial branch standards dealing with hydrologic calculations for

⁴⁷ Doan Thi Noi, 2016, English summary of PHD thesis titled "Research on rainfall - runoff changes and propose Scientific methodology to compute designed flood for transportation infrastructure in the northeast mountainous region of Viet Nam". Water Resources University, Hanoi Viet Nam.

⁴⁸ There are 18 climate subregions covering Viet Nam, as defined by MoNRE.

⁴⁹ MoT Decision No. 1456 / QD-BGTVT of 11 May 2016 clarified that the specific objective is to integrate the implementation of measures to improve resilience to climate change in transport investment projects, which is to be pursued in parallel with expanding the country's transport infrastructure.

⁵⁰ The coding of a national standard consists of three fields: the first field shows the letter code indicating the type of standard (for example, national standards are assigned the code TCVN). The second field contains a number that identifies the standard in the order of issuances, and the last field indicates the year when the standard was approved.

⁵¹ The previous version of TCVN 4054 (2005) was issued in 1998. This standard was developed by a Technical Subcommittee on Highway Transportation Works based on MoT's recommendations. The standard was approved by the General Department of Standard, Metrology and Quality Control of the MoST, which officially issued it.

water-based infrastructure, including those previously issued by the MoT pertaining to roads and bridges (e.g., 22 TCN 272-05 for bridges).

555. A key parameter specified under TCVN 4054:2005 is the frequency of the one-day maximum rainfall, where Px represents the probability “x” with which an event is equaled or exceeded in any one year, and is equal to the reciprocal of the return period in years. The specified Px frequency level determines the magnitude of the design rainfall, which is used to determine the design flood level calculated using hydrologic formulas as provided in TCVN 9845:2013. The Px frequency levels are set according to the road category and type of component structure – see Table 87.

556. The guidelines use a projected maximum daily rainfall level for the required Px frequency specified in the national standard. The procedure for such adjustment is explained in Section IV below.

557. After the Px frequency for a structure has been determined with reference to TCVN 4054:2005, the hydrologic calculations based on that Px frequency use formulas specified in TCVN 9845:2013. To illustrate, under TCVN 9845:2013, the design water discharge at any given road location, e.g., a small bridge, is estimated using the formula below, in which the parameter X_{np} represents the one-day maximum rainfall amount at the Px frequency specified for the type of structure and classification of road.

$$Q_p = A_p \cdot \phi \cdot X_{np} \cdot F \cdot \delta_1 (m^3 / s)$$

558. Definitions of the other parameters in the formula above, including other hydrologic formulas that depend on the Px parameter, are shown in Appendix C. These formulas were applied to three representative BIIG subprojects (details shown in Appendix F) as case studies to demonstrate the effect of adjusting the design rainfall intensity for projected climate change. The guidelines use a projected maximum daily rainfall level for the required Px frequency specified in the national standard. The procedure for such adjustment is explained in Section IV below.

Table 87. TCVN 4054:2005 design frequencies (Px values) applied to different road categories and component structures

| Component structure | Road category* | | |
|---|---|---------|--------------|
| | Expressway | 1 and 2 | 3, 4 and 5** |
| Embankment and protection works | The design frequency is based on the calculated frequency for the associated/adjacent bridge or culvert | | |
| Medium and large bridges ⁵² | P1 | P1 | P1 |
| Small bridges and culvert crossings | P1 | P2 | P4 |
| Intercepting and lateral (side) ditches | P4 | P4 | P4 |

*The road category is defined in terms of use and traffic forecast for the specific road section – lower category numbers (category 1 and 2) have higher traffic forecasts.

**The frequencies apply for both mountain roads and roads located on flat areas, i.e., “plain roads”.

⁵² Large bridges are those with drainage aperture (or opening) exceeding 100 meters. Medium bridges are those with aperture between 25 to 100 meters. And small bridges are those with less than 25 meters aperture.

559. Under certain conditions the Px design frequencies in Table 87 can be adjusted. These conditions are identified as: (i) technical difficulties in complying with the standard, the calculated frequencies may be relaxed (e.g., from P4 to P5) subject to approval by relevant authorities, although these are not identified, and (ii) if, during field investigation or surveying, historic maximum flood water levels are found to be higher than the flood levels calculated through frequency analysis, the historic flood water is to be used, especially for designing large bridges. No opportunity is provided to adjust the design frequencies for financial budget or cost constraints.

560. Further adjustment is available for category 5 roads only. For category 5 the road elevation may allow the road to be overtopped. This applies to crossings⁵³ over a wide and flat river bed with shallow depth, over waterways where water is not fast-flowing, and at localized depressions. Such “submersible” road sections can be combined with culverts (usually box-type) to allow water to pass underneath and reduce water depth over the crossing. The maximum permissible water depth above the top of submersible road sections are specified in terms of expected water velocity at the crossing and the type of vehicle – see Table 88.

Table 88. Allowable maximum depths for submersible crossings within Category V roads (meters)

| Water velocity in meters per second | Allowable maximum depth above the submersible road section | | |
|-------------------------------------|--|------------------|------------------------|
| | Cars | Chained vehicles | Non-motorized vehicles |
| Less than 1.5 | 0.5 | 0.7 | 0.4 |
| Between 1.5 to 2.0 | 0.4 | 0.6 | 0.3 |
| More than 2.0 | 0.3 | 0.5 | 0.2 |

b. Climate resilient planning and design challenges

561. Design engineers in Vietnam are aware of climate change issues, but they find it difficult to incorporate climate change effects for a variety of reasons: a lack of measured flow and flood level data for the vast majority of rivers, difficulty in accessing projections data on daily maximum rainfall or flood levels, the additional costs incurred by local design consultants that are not reflected in the detailed design cost norms followed in the sector, and the perceived uncertainty surrounding the considerable range of projections derived from different climate change models and scenarios.

562. The future magnitude of rainfall change remains uncertain,⁵⁴ however, the direction of change (that of increasing rainfall intensity) appears unequivocal. While available climate models do not reliably predict rainfall extremes at local (site-level) scale, the scientific basis for intensifying extremes is well-established and there is consensus among climate models for increased rainfall intensity.

563. The guidelines provide an affordable procedure to incorporate climate risk into the design of site-specific infrastructure. The guidelines are presented in two Parts. Part One presents the recommended approach for small structures or roads categories 3, 4, and 5 the require P4 and P10 frequency for estimation of flood levels. Part Two provides guidelines for structures requiring P1 and P2 frequency levels in the estimation of flood and flow rates.

⁵³ Also referred to as “spillway” crossings in the subproject feasibility studies.

⁵⁴ Change in rainfall intensity, in particular, cannot be predicted with precision and accuracy at sub-regional scale, but always within a range of uncertainty.

IV. Frequency analysis for adjusting the design rainfall

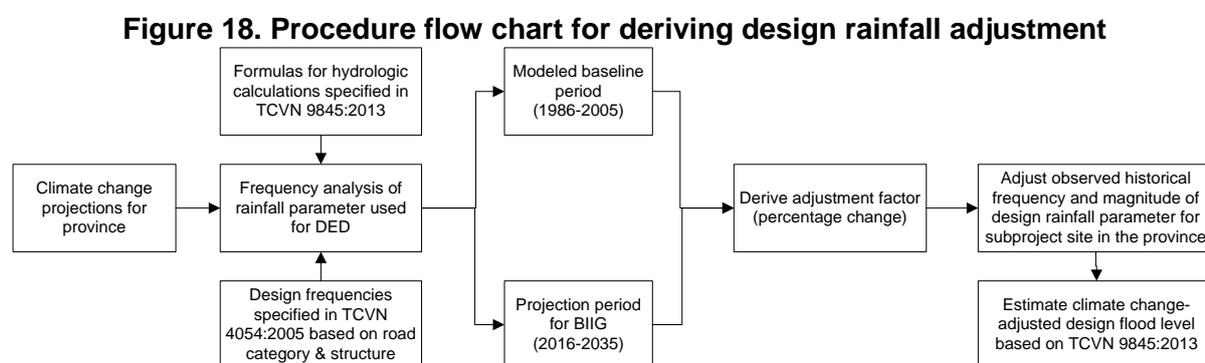
a. Extreme value analysis method

564. Extreme value analysis (EVA) provides a method for the analysis of rare events that lie in the tails of probability distributions. EVA estimates the probability of events that are more extreme than may have previously been observed. The following section presents the use of this analysis to estimate projected daily maximum rainfall adjustments for a P4 rainfall intensity that is applied in the TCVN engineering design formulas to estimate design flood levels for basic structures (road embankments, drainage system, spillway-crossings, and small bridges) associated with road categories 3, 4 and 5.

565. Rainfall intensity-frequency-duration (IFD) relationships are currently derived from historical rainfall records and assume future rainfall will mirror the *statistical* characteristics of the historical rainfall record. Climate modeling projections invalidate this assumption with climate change suggesting historical rainfall IFD relationships are likely to be increasingly unreliable predictors of future flood levels.

566. As explained in Annex D, extreme value analysis used a *Generalized Extreme Value* (GEV) probability distribution function that provided the best fit to data according to statistical tests using the BIIG datasets. Annex D also explains the underlying theory and procedure for fitting statistical models based on extreme value analysis. For these guidelines, the analysis used modeled rainfall data—specifically, the climate models and climate change scenario explained above.

567. The random variable used for the extreme value analysis was the annual one-day maximum rainfall data extracted from the climate model baseline⁵⁵ simulation (1986-2005) and the climate projection for 2016-2035 based on RCP8.5. Daily maximum rainfall at a range of frequency levels derived from the GEV probability distribution function were compared between the two periods. For a given Px frequency level, values corresponding to the maximum daily rainfall in the modeled baseline period and in the projected period were used to calculate percentage adjustments. The percentage adjustments are used to adjust values derived from conventional frequency analysis of historical rainfall data for the site – see Figure 18. The steps are further explained below, and results for each province are tabulated and charted in Appendix E.



⁵⁵ In these guidelines, the term “baseline climate” is used to refer to the modeling simulation of the past climate, while the term “historical climate” is used to refer to the real climate as observed in the past by monitoring stations. A climate model’s predictive ability is fine-tuned by adjusting its baseline simulation so that it matches the historical climate as much as possible.

b. Note on Interpreting frequency probability and return periods

568. The Px notation used in the TCVN standards represents the probability of an event being equaled or exceeded in any one year. The theoretical return period is the reciprocal of that probability. For example, a 25-year event has a $1/25=0.04$ or 4% chance of being equaled or exceeded in any year, denoted by P4.

569. A 25-year event does not mean that it will happen regularly every 25 years, or only once in 25 years. Even though the term "return period" connotes a fixed interval, it is not. In any given 25-year period, a P4 or 25-year event may occur once, twice, more, or not at all, and each outcome has a probability that can be computed.⁵⁶

570. Ten or more years of data are ideally required to perform a frequency analysis for determining return periods that can be supported statistically. A longer time series increases the reliability of the frequency analysis and provides more confidence in the results. The extreme value (frequency) analysis for developing these guidelines used a 20-year time series for each time block.

c. Proposed climate risk adjustment factor

571. Percentage adjustments recommended in these guidelines are applied to the Basic Infrastructure for Inclusive Growth Sector Project (I) and (ii) provinces. Annex E presents the estimated change between the baseline and projected future one-day maximum rainfall under RCP 8.5. Each province-level assessment is presented in one graph comparing five datasets - one for the baseline, one for of the three PRECIS model simulations projecting rainfall, and one being the average across the three projections. The proposed adjustment factor is the percentage change (increase) between the baseline and the average of the three modeling projections.

572. Table 8989 (BIIG-1) and Table 9090 (BIIG-2) present the percentage adjustment factors for one-day maximum rainfall across a range of Px frequency levels.⁵⁷ A feature of the datasets is significant differences in the level of adjustment between provinces highlighting the importance of downscaling climate change projections for a province rather than the 18 climatic zones used in the TCVN standard.

573. In summary, P4 frequency specified in TCVN 4054:2005 for the type of structure is used in the TCVN 9845:2013 hydrological formulas using one-day maximum rainfall as parameter to determine the design flood level, which is in turn used to design the road embankments, assess drainage system requirements, and estimate vertical clearances above the design flood level for small bridges.⁵⁸ The recommended adjustments are in terms of the percentage increases to be applied to the P4 rainfall amounts derived from actual/historical rainfall data for the site.

Table 89. Computed percentage increase relative to baseline 1-day maximum rainfall (BIIG-1)

⁵⁶ The probability P that one or more events occurring during any period (n) will exceed a given threshold can be expressed, using the binomial distribution, as $P = 1 - (1 - 1/T)^n$, where T is the threshold return period (e.g. 50-yr), and n is the number of years for the period being examined. Using this equation, there is approximately a 63% chance of one or more 100-year events occurring in any 100-year period. Using the equation, we can also calculate that the probability of a 100-year flood occurring during a 25-year period (say, the project life) is 22%.

⁵⁷ Note that these values are derived from climate model data which use grid point values that are assumed to represent area averages. They should not be expected to closely match station-based climate data collected at specific sites (point values). However, their statistical properties (mean, variance) are expected to be similar.

⁵⁸ Note that the setting of the spillway top elevations for submersible crossings over shallow streams is based on P10 design frequency.

| Exceedance frequency | Return period, yrs | Province | | | |
|----------------------|--------------------|----------|----------|----------|----------|
| | | Bac Kan | Cao Bang | Ha Giang | Lang Son |
| P20 | 5 | 51% | 42% | 4% | 29% |
| P10 | 10 | 56% | 49% | 12% | 39% |
| P5 | 20 | 61% | 58% | 22% | 49% |
| P4 | 25 | 62% | 61% | 26% | 52% |
| P2 | 50 | 67% | 74% | 39% | 62% |
| P1 | 100 | 72% | 91% | 54% | 72% |

Table 90. Computed percentage increase relative to baseline 1-day maximum rainfall (BIIG-2)

| Exceedance frequency | Return period, yrs | Province | | | |
|----------------------|--------------------|----------|---------|------------|-----------|
| | | Ha Tinh | Nghe An | Quang Binh | Quang Tri |
| P20 | 5 | 24% | 34% | 2% | 24% |
| P10 | 10 | 27% | 35% | 9% | 39% |
| P5 | 20 | 32% | 37% | 21% | 58% |
| P4 | 25 | 34% | 38% | 26% | 65% |
| P2 | 50 | 40% | 42% | 47% | 91% |
| P1 | 100 | 48% | 49% | 78% | 122% |

574. Beyond P4, that is, for very low frequency events (P1 and P2) used for designing medium to large bridges, the computed percentage adjustments shown in Tables 89 and 90 may be unreliable. The sites of medium to large bridges typically involve relatively large drainage basin areas for which the relationship between Px rainfall and Px flood level may be weak.⁵⁹

V. Steps for adjusting design of structures requiring P4 to P10 frequency

A. Applying the guidelines

575. A step-wise implementation of the guidelines is presented below for adjusting the historically derived rainfall data for input to hydrological formulas specified in TCVN 9845:2013, specifically for structures that are required to be designed with P4 rainfall frequency.

- Determine from TCVN 4054:2005 the applicable Px design frequency level for the road category and component structure being designed—specifically, identify those components requiring a P4 (or higher, e.g., P10) design frequency.
- From the subproject site's historical record of rainfall, assemble a time series of 1-day maximum rainfall (in mm/day) for a minimum of 10-years. In general, the return period being projected should not be more than about two times the length or duration of the time series data.
- Complete a data quality and verification check of the historical rainfall data to identify gaps and outliers. The data set needs to be fully populated if the fitted probability distribution function is to be robust. The sensitive nature of the distribution to the completeness of the time series often requires decisions regarding the inclusion or non-inclusion of outliers.⁶⁰

⁵⁹ There is also no significant correlation found between the time series pairs of annual maximum rainfall and maximum river flow/level in the historical data for large (gauged) basins in the BIIG provinces. Incongruent correlations of maximum rainfall and runoff can be expected where the basin is large, as earlier explained. In any case, P1 and P2 design flows/levels that apply to bridges that traverse rivers draining large basins are not customarily determined using empirical rainfall-runoff formulas, unlike for small basins in which the use of empirical formulas to relate (P4) peak rainfall to peak flow is applicable.

⁶⁰ Another approach is to calculate the P4 values with and without the outliers to assess the differences.

- Check for any “jumps”, or “outliers” outside gradual shifts in data values that may be caused by (non-climate) factors like station relocation, and changes in instrumentation or observation practices.⁶¹
- Calculate the Px daily maximum rainfall by conducting an extreme value frequency analysis⁶² of the historical data—that is, calculate the value corresponding to the required Px frequency level which serves as the historical reference value (that is, based on the existing climate) and which needs to be adjusted for climate change impact.
- Calculate the adjustment factor being the percentage increase in daily maximum rainfall for a given rainfall frequency as the change between the projected time period (specified as the economic life of the infrastructure) and the baseline data set.
- Adjust the historical reference value above using the percentage adjustment factor for the province in which the planned subproject is located (Table 89 and
- Table 90). To adjust the baseline value, simply add the adjustment factor (as percent increase in decimal) from the tables.
Adjusted design rainfall = (Historical reference value) x (1 + adjustment factor⁶³)
- Use the adjusted one-day maximum rainfall (corresponding the specified Px frequency level) as input to the hydrological formula in TCVN 9845:2013 to estimate the climate change-adjusted design flood level.
- Use the adjusted design flood level in the setting the technical specifications for the structure being designed.

B. An application of the guidelines to selected BIIG-1 and BIIG-2 subprojects

576. As a case study to highlight the impact of the P4 adjustment the estimated adjustment factor was applied to three BIIG1 and 2 representative road subprojects. These roads are all under categories 4 and 5. Adjustment factors for the one-day maximum rainfall parameter were applied in the hydrologic formulas specified in TCVN 9845:2013 to assess the impact on the engineering specifications for the road embankments, drainage systems and small bridges that are subject to P4 design frequency, as specified in TCVN 4054:2005. Adjustments to the P1 and P2 structures (medium and large bridges) were not calculated.

577. The case-subprojects are summarized in Table 91.

Table 91. Subprojects selected to demonstrate effect of adjusting P4 design rainfall

| Subproject | Features |
|--|--|
| Construction and upgrading of Boc Bo - Bang Thanh - Son Lo Road <i>Bac Kan</i> | Twenty-one km of existing rural road will be upgraded to <i>category 5 mountain road</i> meeting TCVN 4054-05 standards: 6.5 m road base width, 3.5 m surface width, and 1 m hard shoulder each side. Pavement is 3.5 cm <i>asphalt</i> , with 15 cm base and 18 cm sub-base. The road cuts through the slopes of hills with interweaving rock and soil formations. Six small slab bridges (6 m long) are to be upgraded, and 2 new medium-size bridges (33 m and 48 m) are to be constructed along the route. The P4 adjustment factor for this subproject was an increase of 62% above the historical baseline value of the one-day maximum rainfall (Table 89). |
| Dinh Son – Anh Son mountain | The existing 8-km asphalt road is badly degraded due to traffic volume and the axle weight of trucks. The traffic forecast indicates the need for a higher category |

⁶¹ This test is for so-called “stationarity” or time homogeneity. A non-stationary process has a variable variance and a mean that does not return to a long-run mean over time, whereas a stationary process reverts around a constant long-term mean and has a constant variance independent of time. Such changes are easy to identify by plotting the time series data and using an Excel built-in function to detect trend, if any.

⁶² Refer to Annex D, Section B, for the extreme value frequency analysis procedure using the Generalized Extreme Value probability distribution function and the equations used to estimate parameters.

⁶³ Use the decimal value of the percentage increases shown in Tables 4 and 5.

| Subproject | Features |
|--|--|
| road <i>Nghe An</i> | IV road design and the project owner has agreed to apply this during the DED. The route passes through some densely populated sections, agricultural fields and flat lands. There are 3 existing bridges plus a causeway that will be replaced with a bridge. Longitudinal and cross gradients are not high, and the existing subgrade has been assessed as suitable. Surfacing will be with asphalt concrete. The P4 adjustment factor for this subproject was an increase of 38% above the historical baseline value of the one-day maximum rainfall (Table 90). |
| Bao Ninh – Hai Ninh coastal road <i>Quang Binh</i> | The existing coastal road is unpaved. The road is to be improved to support tourism access. Upgrading to category 5 plain road involves widening to 7.5 m, adding 2 layers of base (14 cm) and sub-base (16 cm), and surfacing with 7 cm of asphalt concrete. When finished, the 10.6 km road will have a road-top elevation ranging from 4.1 to 9.9 m above mean sea level. A new 600-m section will provide a commune bypass is to be constructed at the southern end of the alignment. Two spillway-culvert crossings will be replaced. Twenty-eight new culverts are proposed in addition to the 15 existing culverts. The P4 adjustment factor for this subproject was an increase of 26% above the historical baseline value of the one-day maximum rainfall (Table 90). |

578. The detailed results of applying the climate change-adjusted P4 design rainfall to the cases above are presented in Appendix F. The following case summaries highlight the important changes that result from the climate change-adjusted P4 one-day maximum rainfall parameter.

579. For the Boc Bo - Bang Thanh - Son Lo Road in Bac Kan Province, the design flood flow at four small bridge locations was increased by 36% to 119%. Flood water elevations at P4 frequency increased by 0.20 to 2.26 meters after adjustment, which will require raising the elevation of the road embankment at the corresponding sections. The changes in key design parameters of the four small bridges are shown in Table 92.

Table 92. Calculated changes to design parameters of small bridges in Bac Kan subproject

| Site of small bridge | At P4 using historical rainfall data | | | | At P4 under RCP 8.5 scenario | | | |
|----------------------|---------------------------------------|-----------------------|-------------------------|-----------------------|---------------------------------------|-----------------------|-------------------------|-----------------------|
| | Q _P (m ³ /s) | H _P (m) | V _P (m/s) | L _o (m) | Q _P (m ³ /s) | H _P (m) | V _P (m/s) | L _o (m) |
| Khuoi Linh | 39.5 | 64.0 | 1.91 | 7.9 | 53.7 | 64.2 | 2.22 | 8.6 |
| Na Vai | 111.2 | 92.1 | 0.44 | 31.6 | 224.0 | 93.9 | 0.73 | 31.3 |
| Khuoi Man | 75.6 | 148.0 | 1.17 | 23.4 | 165.5 | 149.1 | 1.67 | 24.9 |
| Ban Man | 75.7 | 144.6 | 1.18 | 23.8 | 163.1 | 146.9 | 1.17 | 24.6 |

Q_p is the peak flow rate; H_p is the peak water elevation; V_p is the peak water velocity; and L_o is the design aperture which is the sum of the internal widths between the bridge piers.

580. The recalculation of P4 flood water levels at five flood prone sections along the Dinh Son – Anh Son mountain road in Nghe An province resulted in an increase of 0.81 to 0.87 meter in water elevations. The results for the sections examined are shown in Table 93. At the small bridge location in Dong Dau (Km2+108.26), the calculated peak flow increased from 89 m³/s to 102 m³/s. Calculated floodwater level there at P4 frequency increased from 16.1 m using historical data to 16.9 m under RCP 8.5 climate change scenario. The corresponding design aperture of the bridge increased from 10.0 m to 12.3 m.

Table 93. Calculated changes in flood levels at flood prone sections in Nghe An road subproject

| Flood-prone section (chainage) | Investigated location | Recorded highest flood levels (m) | | | P4 flood level based on historical rainfall data (m) | Adjusted P4 flood level under RCP 8.5 scenario (m) |
|--------------------------------|-----------------------|-----------------------------------|------|------|--|--|
| | | 1988 | 1978 | 2011 | H _p | H _p |
| Km2+020 - Km2+250 | Km2+108.26 | 16.8 | 16.7 | 16.6 | 16.1 | 16.9 |
| Km2+460 - Km2+904 | Km2+759.40 | 16.9 | 16.7 | 16.7 | 16.1 | 16.9 |
| Km4+123 - Km4+258 | Km4+220.16 | 17.1 | 16.9 | 16.6 | 16.3 | 17.1 |
| Km6+742 - Km6+877 | Km6+800 | 17.3 | 17.1 | 16.6 | 16.5 | 17.3 |
| Km7+80 - Km7+340 | Km7+110 | 17.3 | 17.1 | 16.6 | 16.5 | 17.4 |

581. At the Nghe An road subproject, the dimensions of the culverts at 25 locations were recalculated with results showing an increase in required culvert sizes at 6 of the 25 locations. For example, the calculated design flows at a stream located at Km2+759 increased from 5.17 to 7.37 m³/sec, resulting in sizing up the dimensions of the slab culvert from 150 x 150 cm to 200 x 200 cm.

582. For the Bao Ninh – Hai Ninh coastal road, the P4 design flows at two culvert sections increased by around 34% after applying the P4 climate change adjustment. The flood water elevations increased by 0.5 to 0.6 meter, which imply a need to correspondingly raise the level of the road embankment to provide adequate freeboard. The flow velocities at these two culvert locations increased by around 10%, indicating need to strengthen the culvert aprons and wing walls.

VI. Additional DED guidelines for climate resilience

583. As discussed above, preliminary engineering specifications for the road subprojects (and associated bridges), which were assessed to be the most vulnerable to climate change impact and which account for 75 to 80% of the project investment cost, need to be re-assessed during DED to check for robustness to higher design floods, based on hydro-climate projections derived from modeling. This adjustment is deemed as the most important climate resilience measure for the project.

584. Other road structure vulnerabilities were identified in the climate risk and vulnerability assessments done earlier for BIIG-1 and BIIG-2 which examined representative subprojects to identify specific concerns and corresponding response measures.

585. The most important of these concerns were found to be: (i) culvert placements and their fortification against increased water flows, (ii) road foundation strength and provisions to prevent water ingress and consequent structural deformation that would eventually extend to the surface pavement, (iii) slope stabilization for cut sections and road embankment sides, and (iv) provision of proper end-outfalls for lateral ditches. These concerns are related directly or indirectly to a critical climate change indicator identified in the CRVA—that of significantly increased future rainfall intensity as projected by models.

586. Another critical climate change indicator identified in the CRVA is increased heat wave duration. Climate modeling projections indicate longer durations of very hot weather (above 35°C), which is likely to have an impact on the required operating stiffness of flexible/asphalt pavements, and consequently their durability and resistance to deformation.

587. A list of other road component structures found vulnerable to climate change impact, including recommended measures to be taken during DED is provided in Table 94.

Table 94. Vulnerability and resilience measures for other road component structures

| Item exposed and vulnerable to CC risk | Nature of CC risk/hazard | Reference to existing standards, and assessment of adequacy | Measures that can be taken during DED |
|--|--|---|---|
| Culvert placements | Increased water flow rates and water velocities associated with projected intensification of rainfall | Standards provide for various engineering safeguards in constructing culverts. These safeguards are adequate if the flow volumes and velocities are adjusted for higher rainfall intensities | Additional fortification of culvert sections in contact with fast flowing water, such as stronger foundations, extended aprons, and wider wing walls |
| Road foundations | Increased risk of water seepage into the road structure due to intensification of rainfall and flooding; exposure of the sub-grade to high water levels for extended periods | Structural requirements are provided in the standards for designing road embankments under different soil and geologic conditions. These are adequate if the design flood levels are properly adjusted for climate change | Embankment specifications depend on the estimated length of consecutive days to which the structure is exposed to high water level. This is likely to increase with climate change and should be accounted for during the DED |
| Cut slopes (related to new road alignments, or due to widening of existing roads for upgrading to a higher category) | Increased rainfall intensities will lead to increased risk of soil erosion and soil saturation resulting to potential slumping of scoured slopes, especially those | Engineering standards for cult slopes are set mainly according to the geology of the area and the depth of the required cuts to attain design grade. Consider also increased rainfall intensities and | The slope angles mandated in the standards (based on depth of cut and geology) can be maintained if slope protection measures are applied. These include various armoring solutions |

| Item exposed and vulnerable to CC risk | Nature of CC risk/hazard | Reference to existing standards, and assessment of adequacy | Measures that can be taken during DED |
|--|--|--|--|
| | located on non-cohesive soils | their impact of slope stability. | (e.g., retaining walls) in combination with bio-engineering measures where soil conditions allow |
| Drainage ditches | Increased rainfall intensities would result in higher flows, impounding water in ditches without proper outlets; water may penetrate through cracks and saturate the road foundation | The standards do not specifically address measures to prevent ditches from merely impounding water, and should be addressed during DED | Ditch designs should be checked during DED for proper provision of discharge outlets at their ends to prevent the ditches from merely impounding drainage water that may penetrate through cracks and saturate the road foundation |
| Asphalt pavements | Heat wave duration is projected to increase, which can adversely affect stiffness of asphalt | Specifications on flexible pavements are specified in branch standard 22TCN 211 (and as referenced by TCVN 4054:2005). However, specifications date back to 1993 and may need to be updated. | The DED should re-assess the sensitivity of the asphalt pavements, particularly the loss of stiffness caused by temperatures projected to be higher than those recorded in the past, and for longer periods. |

588. The existing standard—in particular TCVN 4054:2005 and the technical branch standards referenced there—already specify measures for road construction that address the concerns above. These measures have been applied in the preliminary engineering design of representative subprojects. However, those preliminary designs were carried out without detailed information on the projected changes in critical climate parameters, notably the intensity of rainfall which is a key input to the engineering formulas used in designing structures. As such, the preliminary designs need to be adjusted, as illustrated in the three subproject cases described above. Also, the engineering safety measures specified in the standard that are relevant to climate resilience are only generally described; they would need to be elaborated or enhanced during the detailed engineering design work itself.

589. Items that need to be addressed more closely during the DED to incorporate climate change risk, with reference to the existing standard and to the critical climate parameters that need to be adjusted in applying the engineering guidelines and formulas, are explained below.

590. Culvert placements. Strengthened culvert foundations are important in view of increased water volumes and velocities associated with intensified future rainfall projected by climate models (see, for example, Table 61 on the Bac Kan subproject case). Fortification of culvert sections in contact with fast-flowing water will be important, particularly their foundation, aprons and wing walls. TCVN 4054:2005 specifies various engineering safeguards for constructing culverts (e.g., provision of drop water structures or chutes below the culverts at steep locations; see Section 9), which are adequate as long as the calculated water flow volumes and water velocities are adjusted for higher rainfall intensities. Design enhancement options include extended culvert aprons with anchor toes to prevent scouring and weakening of the culvert bedding and the area surrounding the culvert placement.

591. The existing TCVN requirements for culverts specify minimum size at 0.75 m diameter. However, it is recommended that the DED examine feasibility of increasing the culvert sizes to at least 1 meter in flood-prone sections with high silt and debris loads, not just to discharge water more quickly but to also facilitate cleaning and removal of soil deposits and debris.

592. Road foundations. The structural requirements and engineering safeguard measures identified in TCVN 4054:2005 (plus the referenced branch standards in 22TCN 171 and 22TCN 262) for designing road embankments under different soil and geologic conditions are adequate as long as the design flood water levels are properly adjusted for climate change.⁶⁴ The standard also provides for measures to stabilize sections with high embankment slopes for protection from scouring. Runoff calculations to estimate erosion rates, and for assessing slope stability, should take into account increased rainfall intensities (in addition to soil characteristics and other parameters). For critical slopes identified, additional measures to be considered during DED may involve reinforcing critical sections, supporting with retaining structures or landslide guard walls, and reforming cut areas with surface soil layer and vegetation cover.

593. Soil types suitable as subgrade fill for road embankments, including the minimum clearance between the subgrade level and the surrounding standing water level (or water table) are specified in Table 22 of TCVN 4054:2005. The specifications depend on the estimated length of consecutive days to which the structure is exposed to high water level, which is likely to increase with climate change and should be accounted for during the DED.

594. Slope stabilization. The standard provides various structural measures for stabilizing embankment slopes and road-cut to protect from erosion and risk of collapse (refer also to 22TCN 262). Additional or complementary measures to reduce infiltration, enhance slope drainage and integrity, including the use of plants should be considered during the DED. Appropriate measures that been field tested and evaluated for effectiveness should be applied.⁶⁵

595. Lateral ditches. These should be checked during DED for proper provision of discharge outlets at their ends to prevent the ditches from concentrating runoff water that may penetrate through cracks and saturate the road foundation, which leads to weakening and reflected deformation and cracks on the road surface.⁶⁶ Section 9.1 of TCVN 4054:2005 on planning of road drainage facilities does not specifically address such measure, and this should be brought to the attention of the DED teams.

596. Asphalt pavements. Specifications on flexible pavements are specified in branch standard 22TCN 211 which dates back to 1993 (and as referenced by TCVN 4054:2005). The DED should re-assess the sensitivity of the asphalt stiffness to temperatures projected to be higher than those recorded in the past. Potential problems that should be examined during DED include migration of liquid asphalt under prolonged hot weather. Heat wave duration, as indicated by the number of consecutive days with temperature exceeding 35°C, is projected by climate models to increase.

597. The quality of asphalt material used in road construction and maintenance is an important resilience measure. The detailed engineering design of flexible pavements should incorporate developments in asphalt technology to check for modified binders that improve the performance of asphalt under increasingly hot weather.

⁶⁴ As specified in TCVN 4054:2005 (Section 7.3.2), the design elevation of the pavement edge of road sections running along riverbanks, approaches to small bridges, culverts, and flooded fields must be at least 0.50m higher than the flood water level at the design frequency specified for the type of structure.

⁶⁵ International Centre for Environmental Management (ICEM). *Natural solutions to erosion control in Viet Nam: Case studies from the Northern mountainous region*. ADB CDTA on Promoting Climate Resilient Rural Infrastructure in Northern Viet Nam, May 2017. Four demonstration sites in Northern Vietnam provinces were set up in this study: two sites on riverside slope management (in Son La and Bac Kan); and two roadside slope management (in Son La and Thai Nguyen).

⁶⁶ Traffic loading is the most important factor influencing pavement performance, and the effect is compounded if the foundation becomes saturated because it then loses its ability to adequately support traffic loads, leading to premature pavement failure.

598. Branch standard 22TCN 334:2005 (as referenced by TCVN 4054:2005) provides technical specifications for construction of macadam foundations in highway pavement structures. For asphalt roads, the DED should further check measures for proper base and sub-base compaction and moisture conditions during road construction. The quality of gravel materials including thickness of the layers to ensure durable performance should be checked and, if necessary, adjusted for projected increased exposure to surrounding water or high water tables (in addition to traffic loads).

599. Concrete pavements. Based on follow-on geological survey work during DED, concrete pavement should be considered in low-lying areas where the road structure is vulnerable to water penetration due to more frequent flooding associated with changing rainfall regimes.

600. Coastal structures. The river port infrastructure subproject in BIIG-2 should be checked for adequate clearance of vital components (e.g., the port's generators) above water level that will likely be higher than levels indicated in frequency analysis of past data on maximum tide and surge levels.

601. Irrigation water use efficiency. For the irrigation subprojects, resilience to future water scarcity requires thinking beyond new water supply measures. DED should combine water supply measures with provisions for increased efficiency in water use. Numerous technical innovations and management measures are available that can improve the efficiency of water use for irrigated agriculture (e.g., lining of canals to reduce seepage, irrigation scheduling to prevent farmers from over-irrigating, and improved rice planting and irrigation methods through use of the system of rice intensification or SRI⁶⁷, among others).

602. Shifting to high-value crops—such as safe vegetables, herbs and spices—that are less water-intensive than traditional rice farming, which is already planned to be promoted under the subproject, should also be considered as a climate resilience measure in the design of cropping systems for agricultural development subprojects.

603. Water supply catchments should be provided with adequate natural vegetation cover to protect from projected future increase in both rainfall intensity and erosivity. Measures to reduce stream erosion—such as through bio-engineering measures that use combinations of live plants and inert structures, and also through construction of check dams and sediment basins—should be considered in the DED to prevent reservoirs from prematurely filling with sediment.

⁶⁷ SRI is based on four management principles that interact with each other: (i) early, quick and healthy plant establishment; (ii) reduced plant density; (iii) improved soil conditions through enrichment with organic matter; and (iv) reduced and controlled water application.

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APPENDIX A: CLIMATE MODELING

A. Climate change modeling

604. Assessing exposure to climate change hazards depends on predicting the direction and magnitude of climate change. Climate change projections are based on plausible scenarios for possible future greenhouse gas emissions as driven by population, technology and socio-economic factors. Several climate groups develop models as a means of informing climate change policy options and providing information on risks arising from climate change. Each model uses different assumptions both in terms of the scope of the underlying physics, datasets, and relationships of variables, and as a result often generate differing projections. This reflects the inherent uncertainty that prevails in both knowledge of climate variables and in the pathways through which Greenhouse Gas (GHG) emission levels will be defined. Such uncertainty positions climate change model outputs as possible scenarios, as opposed to definitive predictors of future climate.⁶⁸

605. The increasing importance of climate change has led to significant advances in scientific understanding resulting in increased complexity of climate modeling techniques to reduce or understand future climate projections. The challenge, however, is that climate projections are mostly globally defined, reflecting the global circulation models that underpin climate science -- yet the actions required to mitigate GHG emissions and adapt to climate change impacts are mostly local. The scale differences between these remain a significant challenge increasing the uncertainty of local level information.

606. Managing uncertainty is a priority in the ongoing development of climate change science. Models are selected that reflect a study region's dominant climate features, especially for climate parameters that are expected to have the most impact. Assessing uncertainty involves characterizing the range of probable outcomes examined either through multiple runs of the same model under different initial conditions, or through using multiple models i.e., an ensemble of models. An ensemble enables produces multiple projections that can be used to develop a probability distribution that in turn can be used to quantify the likelihood of climate change outcomes.⁶⁹

607. When the projection from several models are combined, the resultant average has often been found to be a better correlate of actual observations, than for the output of any individual model as it includes "more information". Nonetheless, climate model projections are all driven by assumptions and need to be interpreted with caution considering the underlying uncertainty.⁷⁰

⁶⁸ IPCC (2013). Climate Change the Physical Science Basis. Working Group No. 1, Contribution to the Fifth Assessment Report. Intergovernmental Panel on Climate Change. Cambridge University Press.

⁶⁹ Likelihood levels in terms of *percentiles* are derived from climate change projections that draw from multiple models, that is, the multiple model results are aggregated using percentile ranking. The 10th percentile value, for example, means that 90% of the models predict values equal to or higher than that percentile value. At the other end, the 90th percentile value means that 10% of the models predict values equal to or higher than that value. Hence, one can say that there is an 80% likelihood that the actual value falls between the 10th and 90th percentile values.

⁷⁰ A primer on how climate models work and how projections are interpreted is available at the website of the US National Research Council's Board on Atmospheric Sciences and Climate: <http://nas-sites.org/climate-change/climatemodeling>. For a more technical description, refer to Chapter 9 of the IPCC's Assessment Report No. 5 (2013): Evaluation of Climate Models.

B. Greenhouse Gas Emission Scenarios

608. Future GHG emissions and CO₂ concentration scenarios used in climate change modeling are defined by the Inter-Governmental Panel of Climate Change (IPCC). After 2007, the IPCC produced so-called “Representative Concentration Pathways” (RCPs) scenarios to provide flexibility in exploring the influence of policy choices, specifically regarding cuts in greenhouse gas emissions. The RCPs are identified by their total *radiative forcing*, measured in watts per square meter (W/m²) in 2100 relative to 1750.⁷¹ Essentially, the RCP’s describe the degree to which GHG emissions are actively mitigated, stabilized or increased and the resultant atmospheric CO₂ concentrations.⁷²

609. The four RCP scenarios span the range of plausible radiative forcing values, from 2.6 to 8.5 W/m². One scenario (RCP2.6) leads to a very low forcing level, two medium stabilization scenarios (RCP4.5 and RCP6) and one high emission scenario (RCP8.5).⁷³ Note that the RCPs were independently developed by different climate modeling groups that used different mathematical representations of the climate system and are, strictly speaking, not directly comparable.

610. In the latest IPCC (fifth) Assessment Report (2013), the RCP scenarios were used to generate projections to reflect the likely outcomes of differing global policy choices for mitigating GHG emissions. Table 95 shows the associated radiative forcing of each scenario, the projected atmospheric CO₂ concentration, and the corresponding representative climate policy.

Table 95. Latest Scenarios Used in the IPCC Fifth Assessment Report (2013)

| RCP Scenarios | Radiative Forcing (W/m ²) | Projected CO ₂ atmospheric concentration by 2100 | Representative Climate Policy |
|----------------|---------------------------------------|---|-------------------------------|
| RCP 2.6 | 2.6 | 421 | Mitigation |
| RCP 4.5 | 4.5 | 538 | Stabilization |
| RCP 6.0 | 6.0 | 670 | Stabilization |
| RCP 8.5 | 8.0 | 936 | Business as usual |

Source: IPCC (2013)

RCP = representative concentration pathway, CO₂ = carbon dioxide, W = watts, m² = square meter

611. Note that there is no preferred single climate change scenario for use in climate change impact studies. The IPCC does not give recommendations on which RCP scenario is more likely to materialize, and there are no weightings applied to the RCPs. Hence, no conclusions are made in climate change studies about the most probable future scenario outcome. Rather, a range of scenarios representing high and low CO₂ concentration levels (sometimes described as pessimistic and optimistic scenarios) are included in climate change simulations to test the “robustness” of adaptation measures.

⁷¹ Radiative forcing is the additional energy taken up by the climate system due to enhanced greenhouse effect. It measures the difference in the balance of energy that enters the atmosphere and the amount that is returned to space (compared to the pre-industrial baseline).

⁷² The word “representative” signifies that each RCP represents a larger set of scenarios compatible with the range of emission scenarios found in the scientific literature. The term “concentration pathway” means that these RCPs are not fully integrated scenarios yet, but instead are internally consistent sets of emission trajectories and corresponding radiative forcing. The results are used in subsequent phases of modeling to explore impact of socio-economic and policy choices. The use of the word “concentration” also means that CO₂ concentrations are used as the primary product of the RCPs, which serve as input to more fully integrated climate models. Unlike the previous generation of scenarios—the SRES scenarios—no fixed sets of assumptions relating to population growth, economic development, or technology are associated with any RCP.

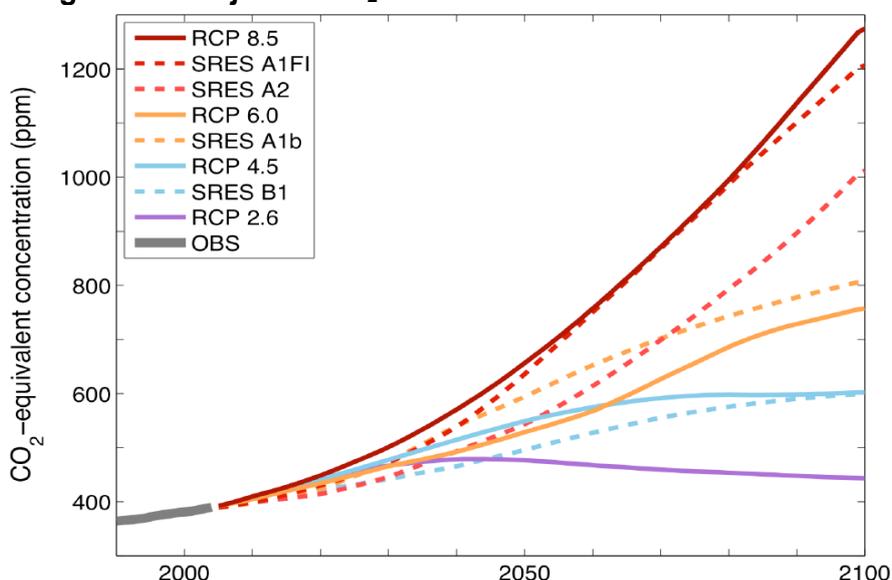
⁷³ Note, by way of perspective, that the global net effect of human activities since 1750 has been estimated as being equivalent to a radiative forcing of 0.6 to 2.4 W/m².

612. Within the context of climate risk to infrastructure, and specifically rural roads and water supply schemes, the economic life of proposed infrastructure is relatively short reflecting the category of road, and the expected traffic forecast and as well as expected traffic growth. Most BIIG-1 and BIIG-2 road infrastructure has an economic life of 12 to 15 years. Thus, the relevant projections are up to mid-2030s.

613. Up to the mid-2030s, the climate change risk to the road infrastructure are expected to be relatively consistent across all four RCP scenarios, since up to about the mid-2030s all RCP scenarios have relatively similar projected atmospheric CO₂ concentrations – see Figure 19.

614. By mid-century (*circa* 2050) the 4 RCP scenarios indicate increasing divergence in atmospheric CO₂ concentrations and the commensurate divergence in climate projections. This is explained by the fact that prior to 2040, projected changes in global climate are largely driven by the warming that is already “in the pipeline”, that is, the atmospheric concentrations faced is already largely known based on past emissions of greenhouse gases and as such the uncertainty introduced from future GHG atmospheric concentration is limited. In contrast, warming after mid-century is strongly dependent on the future levels of GHG emissions that will be determined by still uncertain global policy actions.

Figure 19. Projected CO₂ concentration under various RCPs



Source: IPCC (2013); also showed are projections from the earlier set of SRES scenarios.

615. In terms of atmospheric CO₂ concentrations, the two RCP scenarios of interest (RCP 4.5 which represents moderate warming trajectory, and RCP 8.5 which represents strong warming) do not actually differ much up to about 2040s. But thereafter, CO₂ concentration levels under RCP 4.5 peak and stabilize, whereas RCP 8.5 keeps rising. Since we're only projecting up to 2030s for BIIG planning, the two scenarios are relatively similar in terms of GHG emissions. As such the choice of RCP will have little impact and, after a data quality review, the RCP 8.5 scenario was considered more reliable.

616. For purposes of deriving adjustment factors for extreme rainfall to guide the detailed engineering design of BIIG infrastructure subprojects (at P4 frequency), it is recommended that RCP 8.5 associated with a higher projected atmospheric GHG concentration by 2030s be adopted. This RCP represents the most conservative outlook on global management of GHG

emissions.⁷⁴ Nevertheless, for the profiling of climate change in the eight project provinces presented in Appendix B, projections derived from both RCP 4.5 and RCP 8.5 scenarios are provided.

C. Regional downscaling methods

617. Global Climate Models produce projections at very large scale with coarse projections that are informative in the terms of overall global risk but provide limited information at lower levels of aggregation such as national, provincial or local level. With the need to mitigate climate change risk, increasingly local-level actions are required. To inform such programs it is necessary to provide projections at lower scales by “downscaling” from global model projections. Downscaling is used to take information generated at larger scales and to use this to make local projections.

The **National Center for Atmospheric Research** (USA) defines two main approaches to downscaling of climate information as dynamical and statistical.

Dynamical downscaling requires running high-resolution climate models on a regional sub-domain, using observational data or lower-resolution climate model output as a boundary condition. These models use physical principles to reproduce local climates, but are computationally intensive.

Statistical downscaling is a two-step process consisting of i) the development of statistical relationships between local climate variables (e.g., surface air temperature and precipitation) and large-scale predictors (e.g., pressure fields), and ii) the application of such relationships to the output of global climate model experiments to simulate local climate characteristics in the future.

Source: <https://gisclimatechange.ucar.edu>

618. In dynamical downscaling high-resolution simulation models extrapolate from the GCM to regional or local levels. A regional climate model (e.g., PRECIS) is applied to a delineated area in which the boundary conditions are generated or “driven” by a parent GCM. Dynamical downscaling is based on physical laws with the advantage of being able to produce a large variety of climate variables. The disadvantage of this method is computational complexity, which limits the number of GCMs that can be downscaled.

619. Statistical downscaling, on the other hand, uses statistical methods to define the relationships between data at the larger scale and then use these relationships to transform GCM outputs to local scale. Since it is not dependent on specifying complex physical relationships, statistical downscaling is not as computationally demanding.⁷⁵ However, it can only generate a smaller set of climate variables.

620. Downscaled climate projections are adjusted to match the statistical properties of the observed climate—a process known as “bias correction.” This correction is done so that the climate simulation for the historical period statistically matches the actual observations. The correction factor derived is then applied to the future projections from the climate model.⁷⁶

⁷⁴ “Conservative” regarding what can be done to reduce global GHG emissions, still faced with difficulties to effectively address the threat (e.g., US pullout from the Paris climate accord).

⁷⁵ Several statistical approaches can be used for downscaling including limited area modelling, stochastic modelling, pattern based weather approaches and regression analysis. The least computationally demanding of these, regression is generally preferred.

⁷⁶ The climate modeling cells used by MoNRE to represent the provinces were selected to overlap with the locations of Class-1 hydrometeorological stations; this enables bias-correction to be done on the baseline modeling data with reference to historical observations.

D. Viet Nam Climate Change Database⁷⁷

621. Regional Climate Models were used by MoNRE's Institute of Meteorology, Hydrology and Environment, with support from CSIRO/AusAid, to produce high-resolution projections of climate change for Vietnam using *nine* GCMs from the latest set of global models endorsed by the IPCC, namely: NorESM1-M, CNRM-CM5, GFDL-CM3, HadGEM2-ES, ACCESS1-0, MPI-ESM-LR, NCARSST, HadGEM2-SST and GFDL-SST.

622. Dynamical downscaling of the nine GCMs using *five* Regional Climate Models, namely: (i) the AGCM/MRI model from Japan Meteorological Agency (JMA), (ii) the PRECIS model from the UK Met Office, (iii) the CCAM model from CSIRO - Australia, (iv) the RegCM model from ICTP – Italy, and (v) the cIWRf model from Santander Meteorology Group – Spain provides provincial level forecasts. There were 16 computational cases (model-runs) in total. Statistical methods were applied for bias-correction of the model baseline outputs with reference to observed data. See Table 96.

Table 96. Models Used in MoNRE's Climate Change Database

| Regional Climate Model | Resolution and Area coverage | Modeling Organization | Parent GCM |
|-------------------------------|--|---|---|
| cIWRf | 30 km, 3.5-27oN and 97.5-116oE | NCAR, NCEP, FSL, AFWA | NorESM1-M |
| PRECIS | 25 km, 6.5-25oN and 99.5-115oE | Hadley - UK | CNRM-CM5 GFDL-CM3 HadGEM2-ES |
| CCAM | 10 km, 5-30oN and 98-115oE | CSIRO, Australia | ACCESS1-0 CCSM4 CNRM-CM5 GFDL-CM3 MPI-ESM-LR NorESM1-M |
| RegCM | 20 km, 6.5-30oN and 99.5-119.5oE | Abdus Salam International Centre for Theoretical Physics (ICTP), Italy | ACCESS1-0 NorESM1-M |
| AGCM/MRI | 20 km covering entire globe | JMA, Japan | NCAR-SST HadGEM2-SST GFDL-SST SST ensembles |

623. Of the five Regional Climate Models applied by MoNRE to downscale various GCMs, PRECIS was noted to be the most reliable according to the Ministry's 2016 Report on Climate Change and Sea Level Rise Scenarios for Vietnam (page 39, full report in Vietnamese).

⁷⁷ Ministry of Environment and Natural Resources. Climate Change and Sea Level Rise Scenarios for Vietnam. Hanoi, 2016 (in Vietnamese; a summary version for Policy Makers is available in English).

624. In deriving the climate change adjustment factors for extreme rainfall based on the TCVN/TCN-specified frequencies, only data from the downscaling of three GCMs using PRECIS were used, namely: CNRM-CM5, GFDL-CM3 and HadGEM2-ES (as shown in Table 10).

APPENDIX B: PROJECTED CLIMATE CHANGE IN PROJECT PROVINCES⁷⁸

A. Increase in temperature

625. According to MoNRE, average annual temperatures throughout the country increased by 0.62°C from 1958 to 2014, at an average of approximately 0.1°C per decade. Extreme temperatures are projected to increase in all climate zones. The number of hot days (maximum temperatures exceeding 35°C) show increasing trends in most of the country.

626. Under Scenario RCP 8.5 the projected average temperature increase in BIIG-1 provinces is 1.1°C and 2.2°C, for early and mid-century, respectively. For BIIG-2, the corresponding average increase is 0.9°C and 1.9°C, respectively.

627. Although changes in average temperature increases are modest, the projected change in extreme temperatures is more significant. Heat wave occurrence, (defined as number of consecutive days with maximum temperatures exceeding 35°C), is projected to increase across all the BIIG provinces. For temperature, changes projected from 8 downscaled GCMs using data obtained from MoNRE are summarized in Table 97.⁷⁹

Table 97. Projected change in heat wave duration (number of consecutive days with $T_{\max} > 35^{\circ}\text{C}$)

| Province | Baseline number of days | RCP 4.5 | | RCP 8.5 | |
|------------|-------------------------|-----------|-----------|-----------|-----------|
| | | 2016-2035 | 2046-2065 | 2016-2035 | 2046-2065 |
| Bac Kan | 4 | 7 | 15 | 11 | 20 |
| Cao Bang | 6 | 9 | 16 | 12 | 20 |
| Ha Giang | 5 | 7 | 14 | 10 | 19 |
| Lang Son | 1 | 2 | 7 | 3 | 10 |
| Ha Tinh | 13 | 37 | 114 | 62 | 145 |
| Nghe An | 12 | 42 | 128 | 67 | 155 |
| Quang Binh | 17 | 28 | 97 | 47 | 122 |
| Quang Tri | 18 | 33 | 88 | 46 | 113 |

B. Increase in rainfall intensity

628. Across Viet Nam rainfall is projected to increase. Under RCP 4.5, by early century, annual rainfall is projected to increase by 5 to 10% relative to 1986-2005. By mid-century, rainfall would increase 5 to 15% overall. Under RCP 8.5, the projected increase is of roughly the same magnitude. Projected change in 1-day and 5-day maximum rainfall are higher than annual changes, increasing by 10 to 70% relative to 1986-2005.

629. For BIIG-1 provinces, observations from inland stations during 1961 to 2010 indicate a slight decreasing trend in annual rainfall. In BIIG-2 corresponding station observations show almost no change in annual rainfall. But future rainfall is generally projected to increase in all project provinces. In terms of percentage change relative to reference period (1986-2005), mean values derived from climate modeling are shown in Table 98.⁸⁰

⁷⁸ Additional information on climate change projections for BIIG-1 and BIIG-2 are provided in the Climate Risk and Vulnerability Assessment report for each subregion.

⁷⁹ The eight GCMs were: CCAM-CCSM4, CCAM-CNRM-CM5, CCAM-GFDL-CM3, CCAM-NorESM1-M, cIWRF-NorESM1-M, PRECIS-CNRM-CM5, PRECIS-GFDL-CM3, PRECIS-HadGEM2-ES. Three *regional climate models* were used to downscale these eight GCMs: CCAM, cIWRF and PRECIS. CCAM was used on 4 GCMs; cIWRF was used on 1 GCM; and PRECIS was used on 3 GCMs.

⁸⁰ The ranges of projections with reference to 10% and 90% percentile values (i.e., 80% confidence interval) are shown in the CRVA reports for BIIG-1 and BIIG-2.

Table 98. Projected change in annual rainfall (%)

| Province | Baseline (mm) | RCP 4.5 | | RCP 8.5 | |
|------------|---------------|---------|---------|---------|---------|
| | | 2016-35 | 2046-65 | 2016-35 | 2046-65 |
| Bac Kan | 1,492 | +17.4 | +18.3 | +6.6 | +15.4 |
| Cao Bang | 1,678 | +14.2 | +16.0 | +3.8 | +12.8 |
| Ha Giang | 2,459 | +5.8 | +7.8 | -3.3 | +4.0 |
| Lang Son | 1,498 | +18.7 | +18.7 | +10.5 | +17.9 |
| Nghe An | 2,035 | +10.2 | +16.8 | +16.6 | +21.6 |
| Ha Tinh | 2,720 | +11.3 | +16.3 | +12.9 | +14.1 |
| Quang Binh | 2,425 | +10.1 | +12.6 | +10.8 | +14.1 |
| Quang Tri | 2,178 | +11.4 | +16.6 | +16.5 | +16.8 |

Note: A plus sign means increase as a percentage of baseline; negative means decrease. Baselines were derived from the average of 3 climate models.

630. Extreme rainfall events are projected to increase more in both sub-regions. Most additional annual rainfall will be as more intense precipitation during the wet season, and during occurrences of typhoons predicted to become stronger. Percentage changes in the extreme rainfall based on the average of three modeling runs using the regional climate model PRECIS,⁸¹ are shown in Table 99. For the maximum one-day rainfall and the maximum five-day rainfall.

Table 99. Projected change in extreme rainfall in BIIG-1 and BIIG-2 provinces (%)

| Province | Annual maximum one-day rainfall | | | | | Annual maximum five-day rainfall | | | | |
|------------|---------------------------------|---------|---------|---------|---------|----------------------------------|---------|---------|---------|---------|
| | Baseline (mm) | RCP 4.5 | | RCP 8.5 | | Baseline (mm) | RCP 4.5 | | RCP 8.5 | |
| | | 2016-35 | 2046-65 | 2016-35 | 2046-65 | | 2016-35 | 2046-65 | 2016-35 | 2046-65 |
| Bac Kan | 101 | +82 | +52 | +47 | +58 | 223 | +83 | +46 | +40 | +58 |
| Cao Bang | 92 | +70 | +54 | +41 | +58 | 211 | +66 | +46 | +32 | +46 |
| Ha Giang | 151 | +10 | +25 | 0 | +17 | 359 | +8 | +21 | -4 | +15 |
| Lang Son | 102 | +42 | +44 | +77 | +65 | 197 | +92 | +52 | +69 | +69 |
| Nghe An | 215 | +23 | +34 | +29 | +35 | 455 | +26 | +40 | +30 | +34 |
| Ha Tinh | 288 | +27 | +38 | +23 | +18 | 649 | +27 | +41 | +26 | +19 |
| Quang Binh | 207 | +31 | +35 | +21 | +26 | 481 | +25 | +35 | +21 | +24 |
| Quang Tri | 194 | +42 | +45 | +38 | +44 | 480 | +35 | +45 | +31 | +40 |

*Colored values for RCP 4.5 appear incongruent for BIIG-1; the projected mid-century values are lower than for early-century, even as the projected annual rainfall is projected to increase as shown in Table 12. Modeled baseline values refer to period 1986-2005, averaged from 3 climate models.

C. Sea level rise

631. Sea levels at coastal monitoring stations of Vietnam rose by about 2.45 mm/yr during the period 1960-2014. From 1993 to 2014, the rate of SLR had increased to 3.34 mm/yr. The largest increase in average sea level was found along the central coast at 4 mm/yr. Under RCP 4.5, the average sea level rise for coastal areas nationally is projected to be about 22 cm by mid-century while under RCP 8.5, the projected average SLR is 25 cm.⁸²

⁸¹ Of the 5 regional climate models used by MoNRE to downscale various global climate models, PRECIS was noted to be the most reliable according to the Ministry's 2016 Report on Climate Change and Sea Level Rise Scenarios for Vietnam (page 39, full report in Vietnamese). In this PPTA study, data from the PRECIS downscaling of 3 GCMs were used: CNRM-CM5, GFDL-CM3 and HadGEM2-ES. The tabulated values are the average from the 3 downscaled GCMs. Among these GCMs, MoNRE informants indicated that CNRM-CM5 was the most "stable" (i.e., the variability of the projections is not too wide compared to the other 2 GCMs). This GCM was used to set the baseline for the extreme value frequency analysis of maximum one-day rainfall projections shown in Annex E.

⁸² With 80% of models predicting in the range of 14 to 32 cm and 17 to 35 cm, respectively.

632. The coastal zone of the BIIG-2 provinces is covered by two sea level monitoring regions from Hon Dau near Hai Phong in the north to Deo Hai Van near Da Nang to the south. The average values of sea level rise projections from multiple models are shown in Table 100.

Table 100. Sea level rise projections for BIIG-2 coastal zone (cm)

| Scenario | Coastal region | 2030 | 2050 | 2080 | 2100 |
|----------|-------------------------|------|------|------|------|
| RCP 4.5 | Hon Dau - Deo Ngang | 13 | 22 | 39 | 53 |
| | Deo Ngang - Deo Hai Van | 13 | 22 | 40 | 53 |
| RCP 8.5 | Hon Dau - Deo Ngang | 13 | 25 | 50 | 72 |
| | Deo Ngang - Deo Hai Van | 13 | 25 | 50 | 72 |

Note: Deo Ngang is at the border of Ha Tinh and Quang Binh.

633. Storm surge is a rise in sea level due to the impact of typhoons or tropical depressions. In the coastal area between Nghe An and Ha Tinh, the observed highest storm surge was 400 cm. MoNRE has estimated that the highest storm surge in this coastal stretch is likely to be 450 cm. Between Quang Binh and Hue, the highest observed storm surge was 300 cm, and MoNRE's estimate of the highest possible surge that can occur along this coast is 350 cm.

APPENIX C: HYDROLOGICAL COMPUTATION FORMULAS

634. For traffic structures, the calculation of flood characteristics is specified in legacy documents and guidance documents over the past years. For example, the standard on “calculation of design hydrological characteristics” - QP.TL. C-6-77 has been applied since 1977. In 1996 the calculation of flood characteristics was improved based on the branch standard 22-TCN 220-1995. Currently, these legacy regulations and standards has been consolidated in a national standard, TCVN 9845:2013.

635. Specifications for the design flood frequency to be used for various transportation works are stipulated in TCVN 4054:2005 and TCVN 5729:2012. However, TCVN 5729:2012 applies only to expressway projects. TCVN 4054:2005 is the most relevant to the road classifications under BIIG-1 and BIIG-2. For hydraulic calculations related to bridge works, the MoT branch standard 22TCN 272:2005 is still applied, even as the specifications there have been incorporated in the more recent national standard, TCVN 9845:2013.

636. To calculate the flood characteristics, various parameters are used including the watershed area, watershed morphology, characteristics of soils and rocks, vegetation cover in the watershed, and the rainfall intensity corresponding to a frequency or return period specified for the structure’s design flood level (as specified in TCVN 4054:2005).

637. In brief, the calculation of the flood characteristics for traffic structures is conducted as follows: based on TCVN 4050-2005, determine which flood frequency is applicable for the category of road and the type of component structure. Then apply the formula to estimate the design flood level, as specified in TCVN 9845:2013. Use the one-day maximum rainfall corresponding to the design flood frequency specified for the structure.

638. TCVN 9845:2013 specifies the methodology for calculating flood flow characteristics caused by heavy rain for small structures on rivers that are not impacted by the tide and not associated with mud/rock flows. According to this standard, the calculation of the design flood peak for a given watershed can be based on one of the following formulas:

- For a watershed with area smaller than 100 km², it is possible to use the “Limited Strength” formula.
- For a watershed with area exceeding 100 km², it is possible to use the “Discount” formula.
- In addition to using the formulas above for medium and large watersheds, it is advised to compare the calculated results with other methods such as modeling of the river section and other approaches (Section 5.1 TCVN 9845-2013, Page 10).

Limited Strength Formula

$$Q_{P\%} = A_{P\%} \cdot \phi \cdot H_{P\%} \cdot F \cdot \delta$$

639. where (the dot symbol means multiply):

- i. P% - Design frequency (Section 10, TCVN 4054:2005 and Section 9, TCVN 5729:2012)
- ii. H_{P%} - **Maximum one-day rainfall** corresponding to design frequency P% of the representative station of the watershed, in millimeters. The rainfall data of the station must be updated up to the time of calculation (details are in Appendix B of TCVN 9845:2013).
- iii. Q_{P%} - Flood peak discharge corresponding to design frequency in m³/s;
- iv. F – Watershed area in km²;

- v. ϕ - Flood flow coefficient, depends on the type of soils in the watershed structure, design daily rainfall ($H_{P\%}$) and watershed area (F) (see Table A.1, Appendix A, TCVN 9845-2013);

640. Flow discharge coefficient ϕ in the formula is defined by the formula based on daily rainfall, watershed area and the soil/sediment type. The latter, particularly sand content, is determined through sampling.

641. AP% - Relative modular of maximum flow corresponding to the design frequency (Table A.3, Appendix A, TCVN 9845-2013) depending on the rain location, hydrological, and topographical features of the river bed ϕ_s (defined by formula 10), the concentration time of the flow on the slope τ_{sd} . Note that τ_{sd} is defined according to Section 5.2.2.1 of the regulation.

642. δ - The factor at the level that reduce slightly the flood discharge by the ponds, lakes, swamplands in the area, defined according to Table 6, TCVN 9845:2013.

Discount formula

643. As specified for the watershed with the area of more than 100 km², the flood frequency can be calculated by the discount formula, as follow:

$$Q_p = q_{100} \left(\frac{100}{F} \right)^n \lambda_p \cdot F \cdot \delta \quad (m^3 / s)$$

Where:

q_{100} – Flood peak module corresponding to frequency of 10% converted to 100km² watershed, see Table A.5, Appendix A, TCVN 9845:2013 according to the station near the construction site; units in m³/s/km².

$\left(\frac{100}{F} \right)^n$ - Discount coefficient for the flood peak module by the area, n is referred to Table A.5,

Appendix A, under TCVN 9845:2013.

F – Watershed area in km²;

λ_p – Frequency conversion coefficient, with reference to Table A.5, Appendix A, TCVN 9845:2013;

δ - a factor to consider the regulating effects of ponds, lakes and swamps.

644. In case the selected watershed has different survey data, to calculate the flood peak frequency, the following formula can be used:

$$Q_p = q_{ptt} \left(\frac{F_a}{F} \right)^n \frac{\delta}{\delta_a} F$$

where:

q_{ptt} – Flood peak module of the similar watershed by practical measurements, m³/s/km²;

F_a, δ_a – area and regulating coefficient of the similar watershed.

645. The similar watershed, beside above requirements, need to have daily rainfall corresponding to design frequency not much different from this rainfall in the study area.

646. In addition, TCVN 9845:2013 also specify the tasks and calculation contents of other parameters such as design water level, discharge distribution, and flow velocity in rivers and streams, and design aperture. These calculations indirectly relate to the maximum daily rainfall via design flood peak discharge.

APPENDIX D: STATISTICAL MODELING USING EXTREME VALUE ANALYSIS

A. Extreme Value Theory

647. Changes in extreme events is assessed using extreme value theory to calculate extreme quantiles (depicted by the cumulative distribution function) for different periods, both past and future. Specifically, the theory is used to estimate the intensity and frequency of rare events that lie far in the tails of the probability distribution. The most common approach involves fitting a statistical model to the annual extreme values in the time series data.

648. The application of this classic theory assumes that the time series being analyzed is “stationary”, that is, the statistical parameters (mean and variance) are constant for the time series.⁸³ In using projected climate data that cover several periods (e.g., baseline, early century, mid-century) it is assumed that the time series is stationary within any one period. As such the periods being assessed need to be sufficiently spaced to provide detectable changes in statistical parameters across periods. For the purpose of climate change impacts the MoNRE databases use a baseline time series covering 1986-2005; early-century period of 2016-2035; and mid-century of 2046-2065.

649. Extreme value analysis (EVA) requires putting together a sample of extreme values obtained by selecting the maximum value observed in each time block (e.g., year or season). Statistical tests confirm that the Generalized Extreme Value (GEV) distribution is appropriate for block maximum values.⁸⁴

650. This analysis procedure can be applied to both modeled climate data and actual historical data on selected climate parameters, in this case one-day maximum rainfall.

651. Theoretically, although very long period return values can be calculated from the fitted probability distribution (say, for 100-year return period), the confidence that can be placed in the results is low if the length of the return period is substantially greater than the period covered by the sample of extremes (in our case, 20 years). Estimating return levels for very long return periods is prone to large sampling errors and potentially large biases due to uncertainty about of the actual shape of the tails of the probability distribution. Generally, confidence in return levels decreases rapidly when the period is more than about two times the length of the time series data.⁸⁵

652. Statistical extreme value analysis comes with uncertainty—in this case, associated with the estimation of the statistical model parameters.⁸⁶ Thus, on top of the climate modeling uncertainty described earlier, statistical modeling of extreme events derived from the climate modeling results creates an additional layer of uncertainty.

B. Fitting of Probability Distribution

653. Identifying the best-fitted probability distribution to an extreme value time series involves applying goodness-of-fit tests. These tests measure the compatibility of the time

⁸³ It also assumes that the statistical parameters are “homogenous” or unchanging over the area of interest.

⁸⁴ Another method using “peaks over threshold” (POT) values to assemble data on exceedances above a specified threshold. For this method, a generalized Pareto distribution is generally found to be the best-fitting statistical distribution function.

⁸⁵ World Meteorological Organization. *Guidelines on Analysis of extremes in a changing climate in support of informed decisions for adaptation*. WMO Climate Data and Monitoring WCDMP-No. 72, 2009.

⁸⁶ Uncertainty may be related to the statistical techniques, but depend particularly on the sample series length for extremes analysis. The fitted probability distribution is also very sensitive to inclusion or exclusion of outlier values.

series with the theoretical probability distribution function, i.e., to test if a sample of data came from a population with a specific probability distribution.

654. To construct the statistical model for the one-day maximum rainfall, we fitted 10 probability distributions to samples of time series derived from the climate modeling data on one-day annual maximum rainfalls. The Kolmogorov-Smirnov and Anderson-Darling tests were used along with the chi-square test at 0.01 level of significance to identify the best-fitting probability distribution.⁸⁷ The candidate distributions were ranked from (highest) 1 to 10 based on lowest t-statistic value. The probability distribution with consistent high ranking using the Kolmogorov-Smirnov test was selected.

655. The Generalized Extreme Value distribution represents the best fit to data. The goodness-of-fit test served to validate the recommended statistical model in the literature on extreme value analysis. Then we applied this model to calculate exceedance probabilities and corresponding return periods.

656. The GEV distribution is a three-parameter model with the following probability distribution function, where $z=(x-\mu)/\sigma$, and k , σ , μ are the shape, scale and location parameters, respectively. The scale must be positive ($\sigma>0$), whereas the shape and location can take on any real value.

$$f(x) = \begin{cases} \frac{1}{\sigma} \exp(-(1+kz)^{-1/k}) (1+kz)^{-1-1/k} & k \neq 0 \\ \frac{1}{\sigma} \exp(-z - \exp(-z)) & k = 0 \end{cases}$$

657. The range of definition of the GEV probability distribution depends on the value of the shape parameter k :

$$\begin{aligned} 1 + k \frac{(x - \mu)}{\sigma} > 0 & \quad \text{for } k \neq 0 \\ -\infty < x < +\infty & \quad \text{for } k = 0 \end{aligned}$$

658. The parameters of the GEV probability distribution function are estimated from the time series (e.g., a 20-year record of annual maximum daily rainfall).⁸⁸ Estimated GEV parameters are applied to generate, first, the probability density function using the formula above—and from it, the cumulative distribution function. The cumulative distribution function is then used to calculate the annual exceedance probabilities and corresponding return periods.⁸⁹ The latter refers to the probability that an event is equaled or exceeded in any single year. The return period is the reciprocal of the exceedance probability.

659. After estimating the parameters of the GEV probability distribution, the probabilistic model was used to compare the return period of baseline and future extreme rainfall.

660. Theoretically, although very long period return values can be calculated from the fitted probability distribution (say, for 100-year return period), the confidence that can be placed in

⁸⁷ The Anderson-Darling test is just a modification of the Kolmogorov-Smirnov (K-S) test. It gives more weight to the distribution tails than does the K-S test. We placed more weight on the result of the K-S test in selecting the best-fitting distribution.

⁸⁸ Open source statistical modeling packages are available to automate fitting of probability distribution functions, such as the programming language R (www.r-project.org). Commercial packages are also available, such as EasyFit (www.mathwave.com), which can be linked to MS Excel.

⁸⁹ The exceedance probability is 1 minus the cumulative probability at any given point (x) in the distribution.

the results is low if the length of the return period is substantially greater than the period covered by the sample of extremes (in our case, 20 years). Estimating return levels for very long return periods is prone to large sampling errors and potentially large biases due to uncertainty about the actual shape of the tails of the probability distribution. Generally, confidence in return levels decreases rapidly when the period is more than about two times the length of the time series data.⁹⁰

661. As with climate modeling uncertainty, statistical extreme value analysis comes with uncertainty—in this case, associated with the estimation of the statistical model parameters.⁹¹ Thus, on top of the climate modeling uncertainty described earlier, statistical modeling of extreme events derived from the climate modeling results creates an additional layer of uncertainty. It is important to recognize this propagation of uncertainty throughout the modeling process in interpreting findings.

662. Identifying the best-fitted probability distribution to an extreme value time series involves applying goodness-of-fit tests. These tests measure the compatibility of the time series with the theoretical probability distribution function, i.e., to test if a sample of data came from a population with a specific probability distribution.

663. To construct the statistical model for the one-day maximum rainfall, we fitted 10 probability distributions to samples of time series derived from the climate modeling data on one-day annual maximum rainfalls. The Kolmogorov-Smirnov and Anderson-Darling tests were used at 0.01 level of significance to identify the best-fitting probability distribution.⁹² The candidate distributions were ranked from (highest) 1 to 10 based on lowest t-statistic value. The probability distribution with consistent high ranking using the Kolmogorov-Smirnov test was selected. A sample goodness-of-fit test results for a time series data set (baseline CNRM model run for Bac Kan) is shown below.

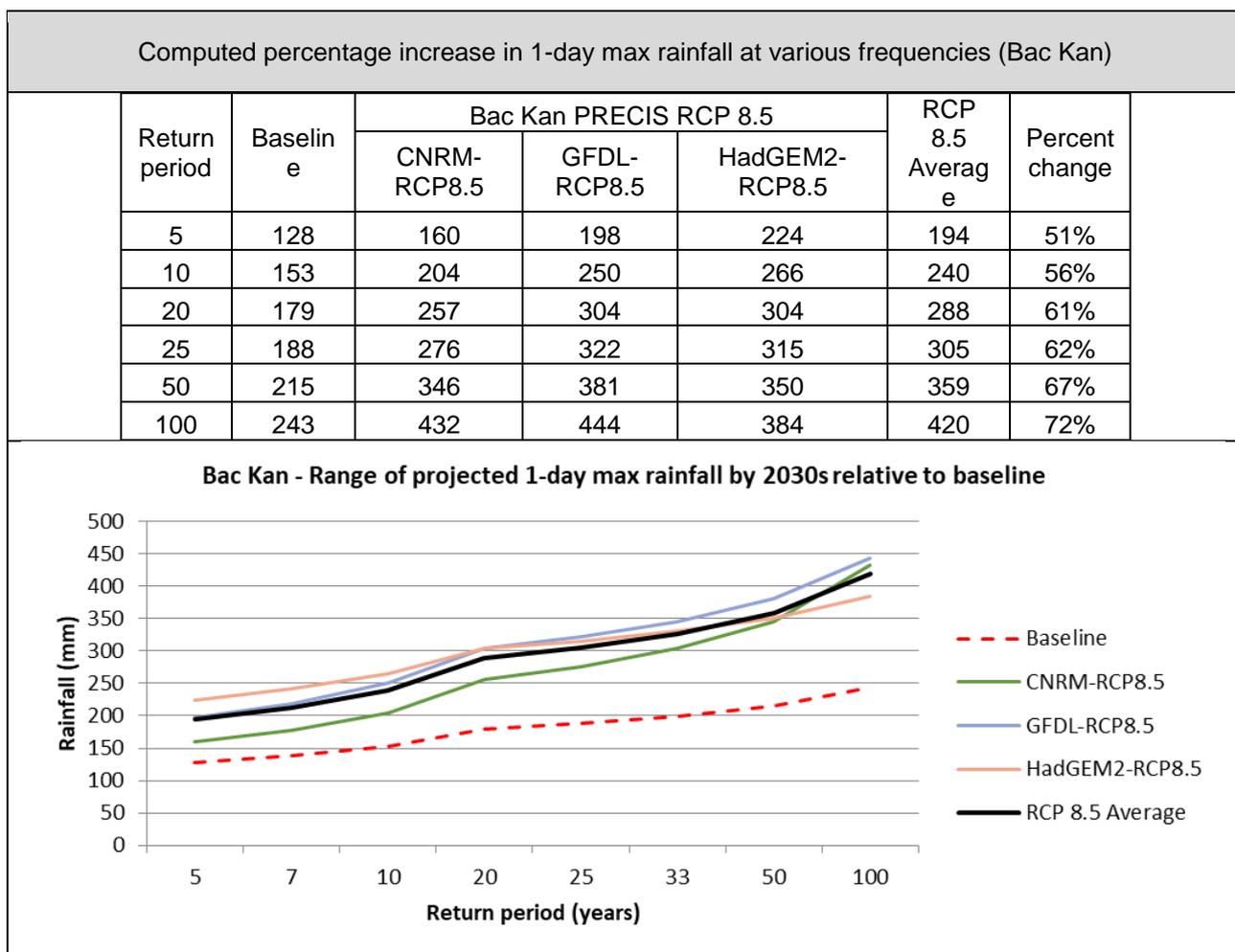
| Distribution | Kolmogorov Smirnov | | Anderson Darling | |
|--------------------|--------------------|------|------------------|------|
| | Statistic | Rank | Statistic | Rank |
| Frechet | 0.21117 | 10 | 0.97013 | 10 |
| Frechet (3P) | 0.10664 | 7 | 0.25044 | 6 |
| Gen. Extreme Value | 0.07925 | 1 | 0.15528 | 1 |
| Gumbel Max | 0.10733 | 8 | 0.34885 | 9 |
| Log-Pearson 3 | 0.09056 | 4 | 0.18677 | 4 |
| Lognormal | 0.11972 | 9 | 0.32719 | 8 |
| Lognormal (3P) | 0.08024 | 2 | 0.18456 | 3 |
| Wakeby | 0.09038 | 3 | 0.15668 | 2 |
| Weibull | 0.10601 | 6 | 0.23953 | 5 |
| Weibull (3P) | 0.10207 | 5 | 0.26229 | 7 |

⁹⁰ World Meteorological Organization. *Guidelines on Analysis of extremes in a changing climate in support of informed decisions for adaptation*. WMO Climate Data and Monitoring WCDMP-No. 72, 2009.

⁹¹ Uncertainty may be related to the statistical techniques, but depend particularly on the sample series length for extremes analysis. The fitted probability distribution is also very sensitive to inclusion or exclusion of outlier values.

⁹² The Anderson-Darling test is just a modification of the Kolmogorov-Smirnov (K-S) test. It gives more weight to the distribution tails than does the K-S test. We placed more weight on the result of the K-S test in selecting the best-fitting distribution.

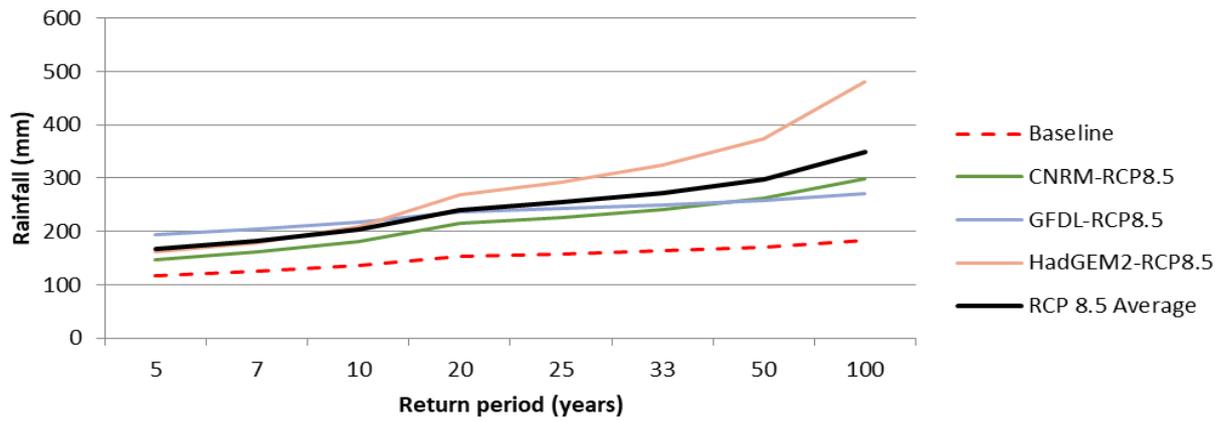
APPENDIX E: FREQUENCY ANALYSIS TABLES AND CHARTS



Computed percentage increase in 1-day max rainfall at various frequencies (Cao Bang)

| Return period | Baseline | Cao Bang PRECIS RCP 8.5 | | | RCP 8.5 Average | Percent change |
|---------------|----------|-------------------------|-------------|----------------|-----------------|----------------|
| | | CNRM-RCP8.5 | GFDL-RCP8.5 | HadGEM2-RCP8.5 | | |
| 5 | 118 | 148 | 194 | 161 | 167 | 42% |
| 10 | 137 | 182 | 218 | 209 | 203 | 49% |
| 20 | 153 | 216 | 237 | 269 | 241 | 58% |
| 25 | 157 | 227 | 243 | 292 | 254 | 61% |
| 50 | 171 | 262 | 258 | 375 | 298 | 74% |
| 100 | 183 | 298 | 270 | 480 | 350 | 91% |

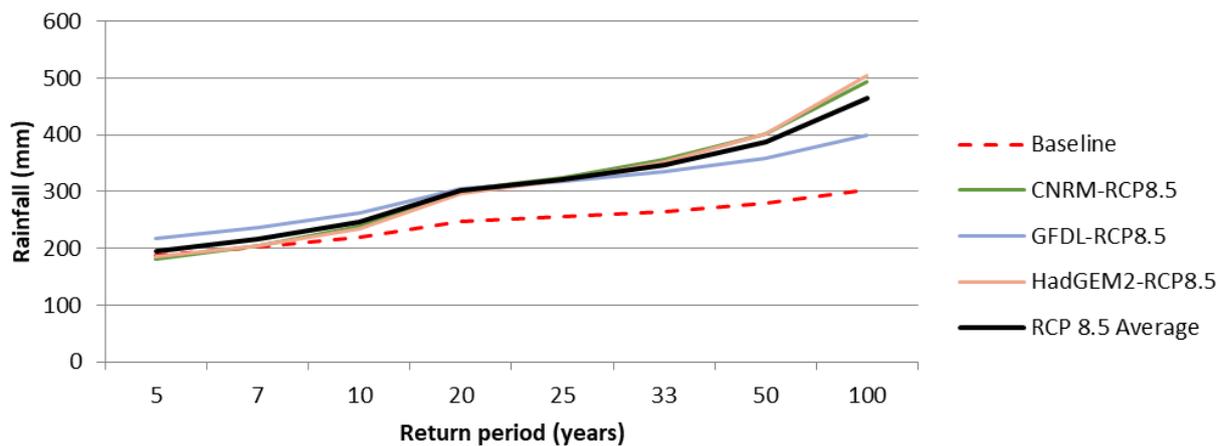
Cao Bang - Range of projected 1-day max rainfall by 2030s relative to baseline



Computed percentage increase in 1-day max rainfall at various frequencies (Ha Giang)

| Return period | Baseline | Ha Giang PRECIS RCP 8.5 | | | RCP 8.5 Average | Percent change |
|---------------|----------|-------------------------|-------------|----------------|-----------------|----------------|
| | | CNRM-RCP8.5 | GFDL-RCP8.5 | HadGEM2-RCP8.5 | | |
| 5 | 188 | 182 | 218 | 185 | 195 | 4% |
| 10 | 219 | 238 | 262 | 235 | 245 | 12% |
| 20 | 247 | 302 | 305 | 297 | 301 | 22% |
| 25 | 255 | 325 | 318 | 320 | 321 | 26% |
| 50 | 280 | 402 | 359 | 402 | 388 | 39% |
| 100 | 302 | 493 | 400 | 504 | 465 | 54% |

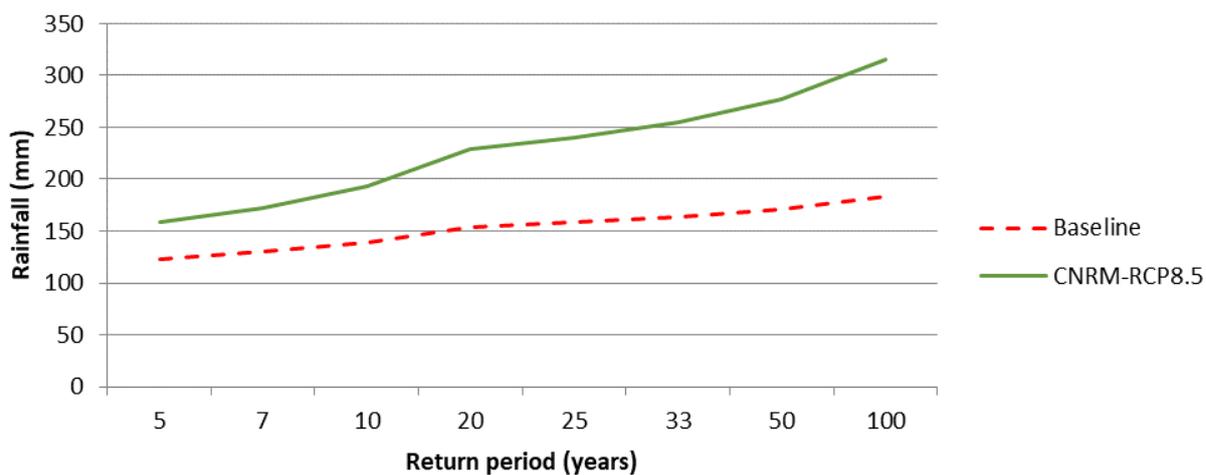
Ha Giang - Range of projected 1-day max rainfall by 2030s relative to baseline



Computed percentage increase in 1-day max rainfall at various frequencies (Lang Son)
 We recommend using only the projection from the CNRM model⁹³

| Return period | Baseline | Lang Son PRECIS RCP 8.5 | | | Percent change |
|---------------|----------|-------------------------|--|--|----------------|
| | | CNRM-RCP8.5 | | | |
| 5 | 123 | 158 | | | 29% |
| 10 | 139 | 193 | | | 39% |
| 20 | 154 | 229 | | | 49% |
| 25 | 158 | 240 | | | 52% |
| 50 | 171 | 277 | | | 62% |
| 100 | 183 | 315 | | | 72% |

Lang Son - Range of projected 1-day max rainfall by 2030s relative to baseline

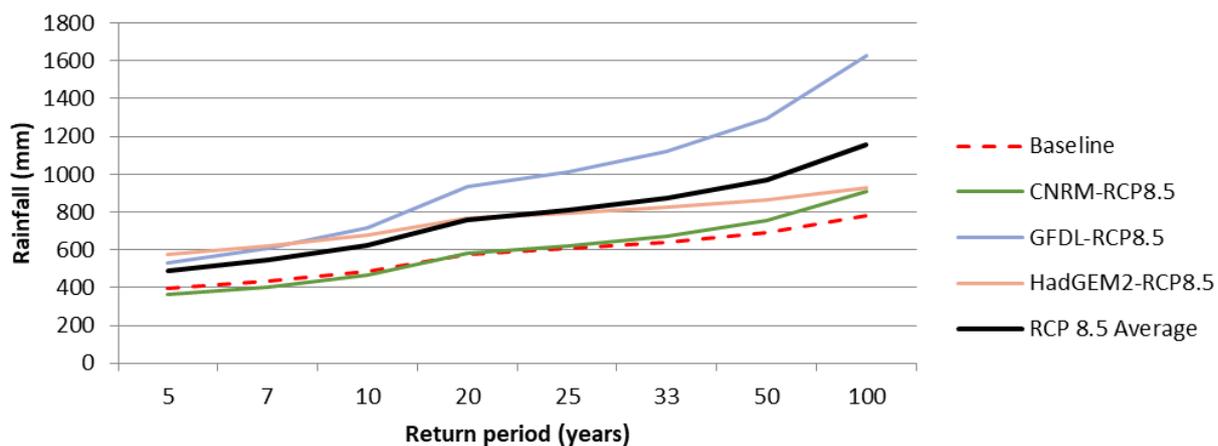


⁹³ The projections from the two other models, GFDL-RCP8.5 and HadGEM2-RCP8.5 appear too high and incomparable with the projection for the adjacent provinces.

Computed percentage increase in 1-day max rainfall at various frequencies (Ha Tinh)

| Return period | Baseline | Ha Tinh PRECIS RCP 8.5 | | | RCP 8.5 Average | Percent change |
|---------------|----------|------------------------|-------------|----------------|-----------------|----------------|
| | | CNRM-RCP8.5 | GFDL-RCP8.5 | HadGEM2-RCP8.5 | | |
| 5 | 396 | 362 | 531 | 576 | 490 | 24% |
| 10 | 488 | 465 | 717 | 682 | 621 | 27% |
| 20 | 577 | 580 | 935 | 769 | 761 | 32% |
| 25 | 605 | 620 | 1014 | 794 | 809 | 34% |
| 50 | 692 | 756 | 1291 | 865 | 971 | 40% |
| 100 | 778 | 912 | 1625 | 925 | 1154 | 48% |

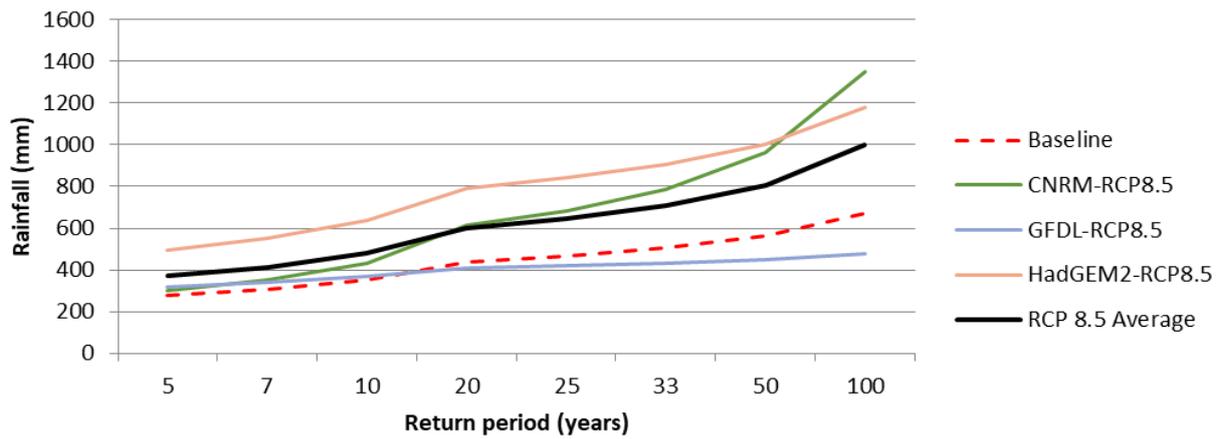
Ha Tinh - Range of projected 1-day max rainfall by 2030s relative to baseline



Computed percentage increase in 1-day max rainfall at various frequencies (Nghe An)

| Return period | Baseline | Nghe An PRECIS RCP 8.5 | | | RCP 8.5 Average | Percent change |
|---------------|----------|------------------------|-------------|----------------|-----------------|----------------|
| | | CNRM-RCP8.5 | GFDL-RCP8.5 | HadGEM2-RCP8.5 | | |
| 5 | 276 | 302 | 320 | 492 | 371 | 34% |
| 10 | 355 | 433 | 368 | 638 | 479 | 35% |
| 20 | 439 | 613 | 407 | 789 | 603 | 37% |
| 25 | 468 | 684 | 418 | 840 | 647 | 38% |
| 50 | 565 | 961 | 449 | 1003 | 805 | 42% |
| 100 | 672 | 1349 | 476 | 1178 | 1001 | 49% |

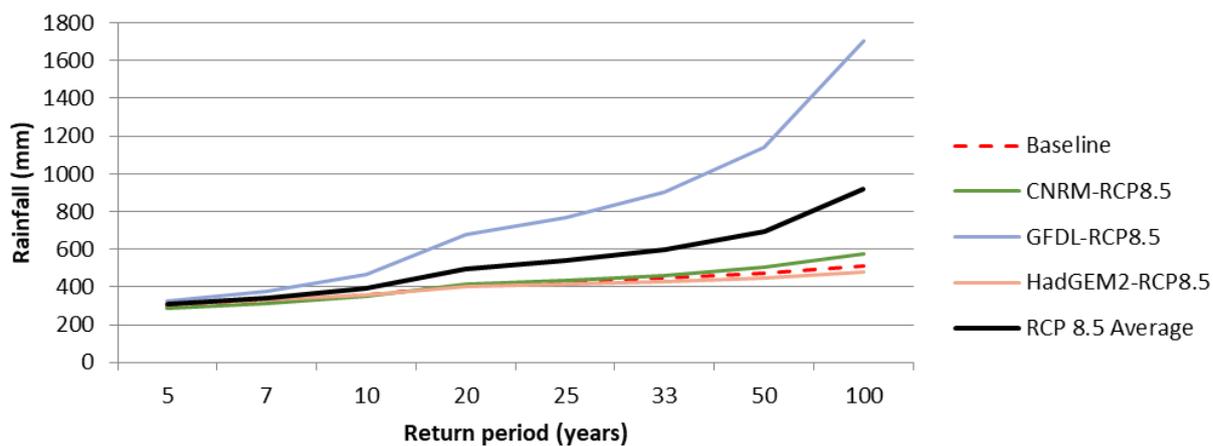
Nghe An - Range of projected 1-day max rainfall by 2030s relative to baseline



Computed percentage increase in 1-day max rainfall at various frequencies (Quang Binh)

| Return period | Baseline | Quang Binh PRECIS RCP 8.5 | | | RCP 8.5 Average | Percent change |
|---------------|----------|---------------------------|-------------|----------------|-----------------|----------------|
| | | CNRM-RCP8.5 | GFDL-RCP8.5 | HadGEM2-RCP8.5 | | |
| 5 | 302 | 288 | 324 | 309 | 307 | 2% |
| 10 | 360 | 350 | 467 | 358 | 392 | 9% |
| 20 | 412 | 414 | 681 | 400 | 498 | 21% |
| 25 | 427 | 435 | 771 | 413 | 539 | 26% |
| 50 | 473 | 503 | 1140 | 447 | 697 | 47% |
| 100 | 515 | 576 | 1702 | 478 | 918 | 78% |

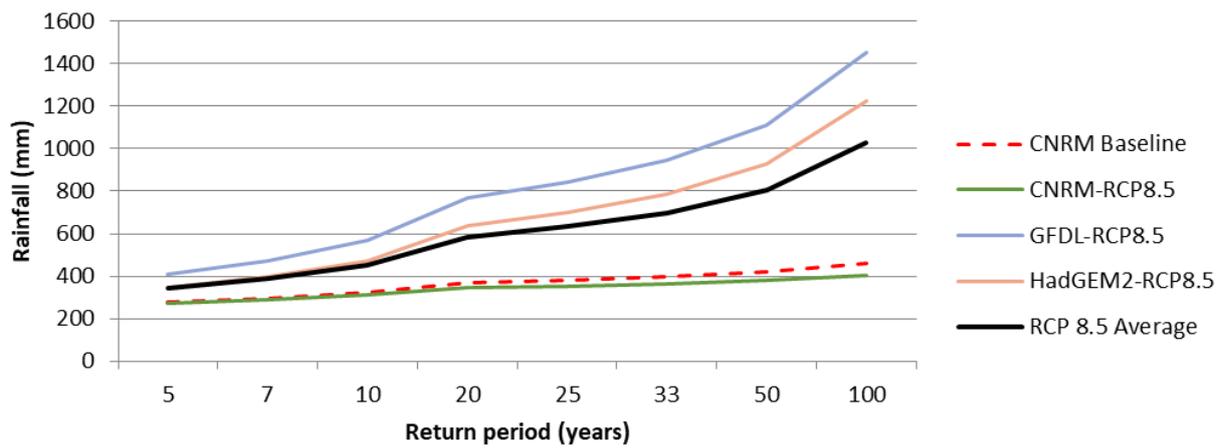
Quang Binh - Range of projected 1-day max rainfall by 2030s relative to baseline



Computed percentage increase in 1-day max rainfall at various frequencies (Quang Tri)

| Return period | Baseline | Quang Tri PRECIS RCP 8.5 | | | RCP 8.5 Average | Percent change |
|---------------|----------|--------------------------|-------------|----------------|-----------------|----------------|
| | | CNRM-RCP8.5 | GFDL-RCP8.5 | HadGEM2-RCP8.5 | | |
| 5 | 278 | 274 | 411 | 346 | 344 | 24% |
| 10 | 325 | 312 | 571 | 474 | 452 | 39% |
| 20 | 369 | 344 | 770 | 636 | 583 | 58% |
| 25 | 382 | 353 | 844 | 698 | 632 | 65% |
| 50 | 423 | 381 | 1112 | 926 | 806 | 91% |
| 100 | 462 | 405 | 1452 | 1223 | 1027 | 122% |

Quang Tri - Range of projected 1-day max rainfall by 2030s relative to baseline



APPENDIX F: RECALCULATION OF BIIG1 AND 2 SUBPROJECT DESIGNS

A. Basis for engineering formulas and computations

664. The case study road subprojects were all designed in accordance with design frequencies for component structures as specified in TCVN 4054:2005. Hydrological calculations for the preliminary engineering design of the representative road subproject in Nghe An were based on formulas specified in national standard TCVN 9845:2013. Calculations for the subprojects in Bac Kan and Quang Binh were computed based on formulas specified in MoT branch standard 22TCN220:1995, which has been incorporated in TCVN 9845:2013.

665. Technical references used included: (i) Computation of Design Hydrological Characteristics (QP.TL.C-6-77) and (ii) Hydrographical and Hydraulic Computation for Road and Bridge handbook published by the Ministry of Transportation in 2006.

B. Projected change in magnitude of 1-day maximum rainfall due to climate change

| Exceedance frequency | Return period, years | Province | | |
|----------------------|----------------------|----------|---------|------------|
| | | Bac Kan | Nghe An | Quang Binh |
| P20 | 5 | 51% | 34% | 2% |
| P10 | 10 | 56% | 35% | 9% |
| P5 | 20 | 61% | 37% | 21% |
| P4 | 25 | 62% | 38% | 26% |
| P2 | 50 | 67% | 42% | 47% |
| P1 | 100 | 72% | 49% | 78% |

C. Design frequencies applied to subproject components

| Province | P% | Component |
|------------|----|-----------------------|
| Bac Kan | P4 | Small bridges |
| Nghe An | P4 | Culvert, small bridge |
| Quang Binh | P4 | Culvert, small bridge |

D. Calculated changes in 1-day maximum rainfall

| Bac Kan | 1-day maximum rainfall (mm/day) | |
|-----------|---------------------------------|----------------------------------|
| | Following historic data at P4 | Following RCP 8.5 scenario at P4 |
| Bản Mạn | 157 | 254 |
| Nà Lại | 157 | 254 |
| Nà Vài | 197 | 319 |
| Khuổi Mạn | 157 | 254 |

| Nghe An | 1-day maximum rainfall (mm/day) | |
|--|---------------------------------|----------------------------------|
| | Following historic data at P4 | Following RCP 8.5 scenario at P4 |
| Dinh Son to Cay Khe road, Anh Son district | 438 | 604 |

| Quang Binh | 1-day maximum rainfall (mm/day) | |
|---|---------------------------------|----------------------------------|
| | Following historic data at P4 | Following RCP 8.5 scenario at P4 |
| Section 1 of Bảo Ninh – Hải Ninh coastal road | 338 | 425 |

E. Calculated change in design of drainage and small bridges

1. Nghe An: *Dinh Son - Thanh Son mountain road*

Computation of water levels under historic and CC scenario for flood-prone sections (caused by overflows of the Con River)

| No. | Flood-prone sections | Investigated location | Highest flood level (m) | | | Historic flood level for design corresponding to P4 (m) | Average increase following RCP 8.5 scenario flood level for design corresponding to P4 (m) | Max. increase following RCP 8.5 scenario flood level for design corresponding to P4 (m) | Notes |
|-----|----------------------|-----------------------------|-------------------------|-----------|-----------|---|--|---|--|
| | | | Year 1988 | Year 1978 | Year 2011 | H ₄ | H ₄ | H ₄ | |
| 1 | Km2+020 - Km2+250 | Km2+108.26(Dong Dau bridge) | 16.84 | 16.69 | 16.6 | 16.08 | 16.95 | 17.36 | Cluster of water levels at small bridge |
| 2 | Km2+460 - Km2+904 | Km2+759.40 | 16.90 | 16.75 | 16.66 | 16.14 | 16.95 | 17.32 | Cluster of water levels at culvert of big span |
| 3 | Km4+123 - Km4+258 | Km4+220.16 | 17.05 | 16.90 | 16.65 | 16.29 | 17.15 | 17.93 | Cluster of water levels at culvert of big span |
| 5 | Km6+742 - Km6+877 | Km6+800 | 17.27 | 17.09 | 16.63 | 16.51 | 17.35 | 18.15 | Cluster of water levels at culvert of big span |
| 6 | Km7+80 - Km7+340 | Km7+110 | 17.29 | 17.11 | 16.64 | 16.53 | 17.37 | 18.17 | Cluster of water levels for alignment |

Computation results for 25 culverts (note: dia = diameter in cm)

| No. | Station | Computed following the actual Max. 1day rainfall of P4 (438mm/day) | | Computed following the 1day max. rainfall of P4 of RPC 8.5 scenario (average. change 38% = 604.44 mm/day) | | Computed following the 1day max. rainfall of P4 of RPC 8.5 scenario (max. Change 79% = 784 mm/day) | |
|-----|------------|--|---|---|--|--|---|
| | | Q ₄ (m ³ /s) | Span of colvert designed at basic step (cm) | Q ₄ (m ³ /s) | Span of colvert designed at basic step (cm) | Q ₄ (m ³ /s) | Span of colvert designed at basic step (cm) |
| 1 | Km0+5.20 | Structure | dia100, maintain the old culvert | Structure | dia100, maintain the old culvert | Structure | B=70 maintain the old culvert |
| 2 | Km0+249.38 | Structure | dia150, maintain the old culvert | Structure | dia150, maintain the old culvert | Structure | dia75; 70 maintain the old culvert |
| 3 | Km1+201.94 | 1.26 | dia150, maintain the old culvert | 1.79 | dia150, maintain the old culvert | 8.02 | Slab culvert L=200; H=250; l _{pm} new culvert |
| 4 | Km1+310.46 | 1.15 | dia150, maintain the old culvert | 1.59 | dia150, maintain the old culvert | 3.46 | 2dia150; make new culvert |
| 5 | Km1+379.99 | 1.08 | dia150, maintain the old culvert | 1.49 | dia150, maintain the old culvert | Structure | dia75; culvert with new design. |
| 6 | Km1+440.74 | 0.96 | Slab culvert L=100; H=100 maintain the old culvert | 1.35 | Slab culvert L=100; H=100; maintain the old culvert | Structure | dia75; maintain the old culvert |

| No. | Station | Computed following the actual Max. 1day rainfall of P4 (438mm/day) | | Computed following the 1day max. rainfall of P4 of RPC 8.5 scenario (average. change 38% = 604.44 mm/day) | | Computed following the 1day max. rainfall of P4 of RPC 8.5 scenario (max. Change 79% = 784 mm/day) | |
|-----|------------|--|--|---|---|--|---|
| | | Q ₄ (m ³ /s) | Span of culvert designed at basic step (cm) | Q ₄ (m ³ /s) | Span of culvert designed at basic step (cm) | Q ₄ (m ³ /s) | Span of culvert designed at basic step (cm) |
| 7 | Km2+759.40 | 5.17 | Slab culvert L=150; H=150; maintain the old culvert | 7.37 | Slab culvert L=200; H=200; lưm cềng mii | Structure | dia75; maintain the old culvert |
| 8 | Km3+20.01 | Structure | B=80, maintain the old culvert | Structure | B=80, maintain the old culvert | 66.87 | Make new culvert, box BxH=3x(3x3) |
| 9 | Km3+297.11 | Structure | B=80, maintain the old culvert | Structure | B=80, maintain the old culvert | Structure | dia75; maintain the old culvert |
| 10 | Km3+615.93 | Structure | B=70, maintain the old culvert | Structure | B=70, maintain the old culvert | 2.45 | Make new culvert dia150 |
| 11 | Km3+815.85 | 1.19 | dia100; maintain the old culvert | 1.74 | dia150; Constructing new culvert | 2.07 | Make new culvert dia150 |
| 12 | Km3+924.35 | Structure | B=70, maintain the old culvert | Structure | B=70, maintain the old culvert | 1.36 | dia75; maintain the old culvert |
| 13 | Km4+30.81 | Structure | dia75; maintain the old culvert | Structure | dia75; maintain the old culvert | 23.85 | Slab culvert L=400; H=300 |
| 14 | Km4+220.16 | 4.25 | 2dia150; maintain the old culvert | 6.09 | 2dia150; maintain the old culvert | Structure | B=100, maintain the old culvert |

| No. | Station | Computed following the actual Max. 1day rainfall of P4 (438mm/day) | | Computed following the 1day max. rainfall of P4 of RPC 8.5 scenario (average. change 38% = 604.44 mm/day) | | Computed following the 1day max. rainfall of P4 of RPC 8.5 scenario (max. Change 79% = 784 mm/day) | |
|-----|------------|--|--|---|--|--|---|
| | | Q ₄ (m ³ /s) | Span of culvert designed at basic step (cm) | Q ₄ (m ³ /s) | Span of culvert designed at basic step (cm) | Q ₄ (m ³ /s) | Span of culvert designed at basic step (cm) |
| 15 | Km4+370.57 | 1.88 | dia150; maintain the old culvert | 2.63 | dia150; maintain the old culvert | Structure | B=70, maintain the old culvert |
| 16 | Km4+628.71 | Structure | dia75; design new culvert | Structure | dia75; design new culvert | Structure | dia75; maintain the old culvert |
| 17 | Km4+883.13 | Structure | dia75; maintain the old culvert | Structure | dia75; maintain the old culvert | 8.02 | Slab culvert L=200; H=250; make new culvert |
| 18 | Km5+21.03 | Structure | dia75; maintain the old culvert | Structure | dia75; maintain the old culvert | 3.46 | 2dia150; make new culvert |
| 19 | Km6+223.28 | 35.67 | Slab culvert L=400; H=450; maintain the old culvert | 50.29 | Constructing new culvert, box BxH=3x(3x2.5) | Structure | dia75; culvert with new design |
| 20 | Km6+582.49 | Structure | dia75; maintain the old culvert | Structure | dia75; maintain the old culvert | Structure | dia75; remain old culvert |
| 21 | Km6+795.11 | 1.17 | dia100; maintain the old culvert | 1.81 | Constructing new culvert - dia150 | Structure | dia75; remain old culvert |
| 22 | Km7+184.05 | 1.16 | dia100; maintain the old culvert | 1.60 | Constructing new culvert - dia150 | 66.87 | Make new culvert, box BxH=3x(3x3) |

| No. | Station | Computed following the actual Max. 1day rainfall of P4 (438mm/day) | | Computed following the 1day max. rainfall of P4 of RPC 8.5 scenario (average. change 38% = 604.44 mm/day) | | Computed following the 1day max. rainfall of P4 of RPC 8.5 scenario (max. Change 79% = 784 mm/day) | |
|-----|------------|--|---|---|---|--|---|
| | | Q ₄ (m ³ /s) | Span of culvert designed at basic step (cm) | Q ₄ (m ³ /s) | Span of culvert designed at basic step (cm) | Q ₄ (m ³ /s) | Span of culvert designed at basic step (cm) |
| 23 | Km7+345.74 | 0.67 | dia75; maintain the old culvert | 1.01 | dia75; maintain the old culvert | Structure | dia75; maintain the old culvert |
| 24 | Km7+600.94 | 12.25 | Slab culvert L=300; H=200 | 17.62 | Slab culvert L=300; H=300 | 2.45 | Make new culvert dia150 |
| 25 | Km7+977.82 | Structure | B=100, maintain the old culvert | Structure | B=100, maintain the old culvert | 2.07 | Make new culvert dia150 |

Computation results for small bridges

| Name of brige | F (Km ²) | Q ₄ (m ³ /s) | H ₁₉₈₈ (m) | H ₄ (m) | V ₄ (m/s) | L ₀ (m) | Remark |
|--|----------------------|------------------------------------|-----------------------|--------------------|----------------------|--------------------|---|
| Dong Dau bridge Km2+108.26 (small bridge) | 1.158 | 89 | 16.84 | 16.08 | 1.88 | 10 | Old bridge is submerged by flood and affected by flood of Con downriver. Recomending to construct a new bridge with sequence circuit: L = 1x12 (m). |
| Computed results following the 1day max. rainfall at P4 of RCP 8.5 scenario (average. change 38% = 604.44 mm/day) | | | | | | | |
| Name of brige | F (Km ²) | Q ₄ (m ³ /s) | H ₁₉₈₈ (m) | H ₄ (m) | V ₄ (m/s) | L ₀ (m) | Remark |
| Dong Dau bridge Km2+108.26 (small bridge) | 1.158 | 102.36 | 16.84 | 16.95 | 1.66 | 12.3 | Old bridge is submerged by flood and affected by flood of Con downriver. Recomending to construct a new bridge with sequence circuit: L = 1x15 (m) |
| Computed results following the 1day max. rainfall at P4 of RCP 8.5 scenario (max. change 79% = 784 mm/day) | | | | | | | |
| Name of brige | F (Km ²) | Q ₄ (m ³ /s) | H ₁₉₈₈ (m) | H ₄ (m) | V ₄ (m/s) | L ₀ (m) | Remark |
| Dong Dau bridge Km2+108.26 (small bridge) | 1.158 | 132.5 | 16.84 | 17.36 | 1.75 | 13 | Old bridge is submerged by flood and affected by flood of Con downriver. Recomending to construct a new bridge with sequence circuit: L = 1x15 (m) |

2. Quang Binh: Section 1 of the Bao Ninh – Hai Ninh plain road

| Item | At P4 of historical rainfall data | | | At P4 of CC RCP 8.5 scenario | | |
|------------|------------------------------------|--------------------|----------------------|------------------------------------|--------------------|----------------------|
| | Q _P (m ³ /s) | H _P (m) | V _P (m/s) | Q _P (m ³ /s) | H _P (m) | V _P (m/s) |
| Culvert C1 | 22.56 | 2.74 | 3.95 | 30.263 | 3.32 | 4.39 |
| Culvert C2 | 16.378 | 2.45 | 3.77 | 21.889 | 2.97 | 4.14 |

3. Bac Kan: Boc Bo - Bang Thanh - Son Lo mountain road

| Site of bridge | At P4 of historical rainfall data | | | | At P4 of CC RCP 8.5 scenario | | | |
|----------------|------------------------------------|--------------------|----------------------|--------------------|------------------------------------|--------------------|----------------------|--------------------|
| | Q _P (m ³ /s) | H _P (m) | V _P (m/s) | L _o (m) | Q _P (m ³ /s) | H _P (m) | V _P (m/s) | L _o (m) |
| Khuoi Linh | 39.52 | 64.02 | 1.91 | 7.9 | 53.75 | 64.22 | 2.22 | 8.58 |
| Na Vai | 111.19 | 92.14 | 0.44 | 31.65 | 224.01 | 93.90 | 0.73 | 31.29 |
| Khuoi Man | 75.63 | 148.04 | 1.17 | 23.38 | 165.49 | 149.15 | 1.67 | 24.91 |
| Ban Man | 75.67 | 144.62 | 1.18 | 23.82 | 163.06 | 146.88 | 1.17 | 24.62 |

Where:

Q_p – Design flow at construction site (m³/s) at frequency P%; Q_p corresponds with H_p

H_p – Design water level (m) at frequency P%

V_p – Streamflow velocity at frequency P%

L_p – Drainage aperture/opening at frequency P%

APPENDIX G: APPROACH USING HYDRO-DYNAMIC MODELING

666. For structural components that require P1 and P2 estimates, such as for medium to large bridges, combined application of climate change modeling and hydrological modeling is a suitable approach.

667. Projections of daily rainfall and relevant atmospheric conditions (e.g., temperature, relative humidity) obtained from regional/downscaled climate models can be used as climatic time series inputs to hydrologic models to assess future change in flood levels. That is, hydrologic modeling results can be compared between simulations using baseline/historical rainfall data and that using projected climate data.

668. Hydrologic models are available, such as the Soil and Water Assessment Tool (SWAT) and Hydrologic Engineering Center - Hydrologic Modeling System (HEC-HMS). These are designed to simulate the complete hydrologic processes of watershed systems. Data input are grouped into five categories: topography, land use, soil, land use management and climate.

669. Essentially, a hydrologic model is first calibrated for the subject basin using historical data. Then climatic input data (representing a range of modeling results) are fed to the calibrated model to assess effects on future river flows (in particular, peak flows used for designing structures) and other hydrologic parameters if relevant to the engineering design (e.g., sediment discharge). The climate input data, in gridded format, can be obtained from MoNRE.⁹⁴

670. Basin-scale hydrologic modeling requires gridded daily precipitation, maximum and minimum temperatures, and wind magnitude as input to simulate similarly gridded daily “state variables” such as runoff. Resulting gridded runoffs are then hydraulically routed to the basin outlet or a specified location (e.g., bridge site). Use of multiple climate modeling outputs to feed the hydrologic model allows the assessment of uncertainty around, say, a mean or median projection, providing quantitative information for risk-based decision making.

671. Impacts of potential climate change on streamflow can be evaluated by comparing simulations using the rainfall data derived from GCMs (e.g., covering 2016-2035, applicable to the operating life of BIIG-1 and BIIG-2 infrastructure subprojects).⁹⁵ The streamflow projections are then compared with the baseline runs of the model (using both observed historical rainfall data and baseline data generated by models) to assess the significance of change.

672. An advantage of using integrated models (e.g., SWAT and HEC-HMS) for climate impact analysis of streamflow is that these models can also be used to examine climate change effects on other factors of change, such as land use change. Changes in vegetation cover and basin alterations due to population growth or development activities (e.g., establishment of tree plantations) can then be considered in projecting future streamflow.

673. A common problem with the use of regional climate modeling outputs directly in hydrological impact studies is that the simulated rainfall often exhibits biases.⁹⁶ Bias correction is often required to bring model-simulated baseline rainfall in line with the historical observations. Such bias

⁹⁴ Climate modeling data, at daily scale, can also be downloaded from existing data distribution centers, such as the one maintained by the World Climate Research Program (WCRP) for the CMIP3 and CMIP5 generation of global climate models (http://cmip-pcmdi.llnl.gov/cmip5/data_portal.html).

⁹⁵ If there is an adequate number of rainfall time series inputs, the streamflow projections can be presented as percentile values to bound the range of uncertainty.

⁹⁶ Modeling biases can arise from the internal physics used in the model or from the errors in lateral boundary conditions.

correction has been applied to the entire time series of rainfall in MoNRE's climate change database.

674. Essentially, for the design of bridges (specifically, to determine the design vertical clearance from the P1 or P2 flood), the modeling sequence and steps are:

- First, set up a basin-scale hydrological model and calibrate/validate it using observed hydro-meteorological data.
- Second, use results from a high-resolution climate model (e.g., downscaled for the basin from a global climate model to determine climate projections for the basin over the analysis period (e.g., reference historical period versus operating period of planned infrastructure, say, up to 2030s). Outputs generated from the climate model (e.g. temperature, precipitation) are used as input to the hydrological model.
- Third, use a hydraulic routing model to convert projected basin runoff (flow volumes) generated by the hydrologic model to flooding depth at various points in the river network. For example, the Hydrologic Engineering Center – River Analysis System (HEC-RAS, which is often used in conjunction with HEC-HMS) is a computer program for modeling water flowing through open channels and computing water surface profiles. HEC-RAS is particularly applicable for bridge and culvert design and analysis, embankment design, as well as river modification studies.⁹⁷

675. An example of this approach is reported for a recent study that investigated possible impacts of climate change on future floods in the VuGia -ThuBon river basin in central Vietnam using a multi-model climate ensemble.⁹⁸ An ensemble of regional climate projections derived from different combinations of global and regional climate models in combination with different greenhouse gas emission scenarios were used.⁹⁹

676. Climate data were used as input to a basin water balance model (WaSIM-ETH) to reproduce discharge data at Nong Son station. Annual maximum discharges were extracted from the modeled daily series for the reference period (1980-1999) and future periods (2011-30, 2031-50, and 2080-99) for use in subsequent extreme value frequency analyses. To derive flood frequency curves for the four time periods, the Generalized Extreme Value probability distribution was fitted to the data.

677. Adjusted return periods were calculated based on the delta change method. In this method, the observed extreme values were adjusted using the derived values from the hydrological simulations, which in turn were fed by future climate projections.

678. The study calculated, on average, an increase for the P1 (or 100-year return period) flood magnitude of 4%, 65%, and 94% for 2011-30, 2031-50, and 2080-99, respectively, relative to the baseline. However, there was a large spread in the simulated peak flood magnitudes derived from

⁹⁷ If water allocation, say for water supply or irrigation development, is the purpose of the analysis, an alternative third model could be a water accounting model (e.g., WEAP, which stands for Water Evaluation and Planning system). Such models can be used to assess the impacts of climate change on water resource availability and water balance in the basin. Results of the hydrological modeling (i.e., projections in river flow), in conjunction with projected water demands, are used as input to the water accounting model. The model calculates a mass balance of flow sequentially down a river system, making allowance for abstractions and inflows. It can be used to simulate alternative scenarios comprising different development and management options.

⁹⁸ Patrick Laux, Tinh Dang, Harald Kunstmann. Expected climate change impacts on extreme flows in Vietnam: The limits of bias correction techniques. *Geophysical Research Abstracts* Vol. 18, EGU2016-8130, 2016.

⁹⁹ In this study, the emission scenarios were based on the 2007 SRES scenarios, which are explained in Annex A.

the different models. Nevertheless, there was agreement among the models towards increased future peak flows. Due to the obtained large spread of simulated peak flood magnitudes, the investigators stressed the need for combined climate and hydrological simulations. They also noted that wide spread in model-projected flood magnitudes remains a crucial problem for decision makers in applying climate change impact assessments, as demonstrated in this case.

679. In another case involving the Mekong Delta Connectivity Project,¹⁰⁰ a climate risk and vulnerability assessment was by carried out and findings reported in 2015. The project involves proposed construction of two large bridges in the Mekong Delta (across the Han River and the Tien River) that would be linked by a 24-km connecting road and 26 small bridges. Thirteen structural components of the project were examined for climate risk and vulnerability--including bridges, road embankments and road drainage structures.

680. For this Mekong delta infrastructure project, the most critical climate change impact—as in the case also of BIIG-1 and BIIG-2--was found to be the likely changes in design flood elevations. The climate risk assessment used rainfall projections from 6 GCMs that were run under two SRES scenarios (A1B and B2), which were used as input to a hydraulic model for the Mekong delta. Modeling results showed that, over a 100-year period, the increase in water level at P1 frequency on the floodplain induced by climate change would reach 0.6 m, while the increase in flood water level at the Cao Lanh bridge site across the Tien River was estimated to reach 0.7 m. Based on these findings, the ICEM study recommended that the design height of the road embankments, including the approach embankments to the bridges, be raised by 0.6 m.

¹⁰⁰ International Center for Environmental Management (ICEM). Climate Risk and Vulnerability Assessment of the Central Mekong Delta Connectivity Project, February 2015.