HIMACHAL PRADESH HORTICULTURE DEVELOPMENT PROJECT

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

(*Includes Tribal Development Framework, Environment Management Framework, Pest Management Plan*)

Draft for Consultation

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ABBREVIATIONS

AAP	Annual Action Plans
ABPF	Agri Business Promotion Facility
AERC	Agro-Economic Research Centre
APMC	Agricultural Produce Marketing Corporation
BIU	Block Implementation Units
CA	Controlled Atmosphere Stores
CSS	Centrally Sponsored Schemes
EG	Environmental Guidelines
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESA	Environment and Social Assessment
ESMF	Environmental and Social Management Framework
GoHP	Government of Himachal Pradesh
GRS	Grievance Redressal Service
GSDP	Gross State Domestic Produce
HDO	Horticulture Development Officer
HPHDP	Himachal Pradesh Horticulture Development Project
HPHDS	Himachal Pradesh Horticulture Development Society
HPMC	Horticulture Produce Marketing Corporation
HPSAMB	Himachal Pradesh State Agriculture Marketing Board
HPSCSTC	Himachal Pradesh Scheduled Castes and Scheduled Tribes Development Corporation
GoHP	Government of Himachal Pradesh
GRS	Grievance Redressal Service
IPF	Investment Project Financing
IPNM	Integrated Pest and Nutrient Management
ISM	Implementation Support Mission
ISP	Implementation Support Plan
ITDP	Integrated Tribal Development Project
KPIs	Key Project Indicators
MIDH	Mission for Integrated Development of Horticulture
M&E	Monitoring & Evaluation
MTR	Mid-Term Review
NGO	Non-Government Organisation
PAD	Project Appraisal Document
PCDO	Progeny Cum Demonstration Orchards
PCU	Project Coordination Unit
PDO	Project Development Objective
PIP	Project Implementation Plan
PIU	Project Implementation Unit
POPs	Package of Practices
SIDBI	Small Industries Development Bank of India
SCA	Special Central Assistance
SMS	Subject Matter Specialist
SHG	Self Help Group
TDF	Tribal Development Framework
TDP	Tribal Development Plan
TSP	Tribal Sub-Plan
UHF	University of Horticulture and Forestry
WUAs	Water User Associations

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EXECUTIVE SUMMARY

Project Context

The state of Himachal Pradesh (HP) is characterized by a significant number of opportunities in high-value commodities. These include, most importantly, diversity in agro-climatic conditions, possibilities to produce for 'off-season' markets, relative high education of producers, and a location relatively close to terminal consumer markets. The state's agriculture is dominated by high value horticulture commodities, which account for about 44 percent of the cropped area and contribute about 48 percent of agricultural gross state domestic product (GSDP). Horticulture in HP has been responsible for many of the positive outcomes in employment, wages, and in turn, poverty reduction. Notwithstanding the significant potential of horticulture production in HP to contribute to higher economic growth and poverty reduction objectives, the state faces a number of sectoral, institutional and policy challenges which need to be addressed systematically if the potential is to be realized and translated into a sustainable development impact. This sector is also faced with competitiveness challenges, as its domestic markets are opened to international trade.

Project Description

In consideration the existing scenario of horticulture industry in the State, the development of horticulture in Himachal Pradesh is envisaged with the assistance of World Bank funded Himachal Pradesh Horticulture Development Project (HPHDP). The Project Development Objective (PDO) is "to support small farmers and agro-entrepreneurs to increase the productivity, quality, and market access of selected horticulture commodities in Himachal Pradesh". The project beneficiaries will include farmers and entrepreneurs especially in the MSME segment, farmer producer organizations, and other value chain participants. The project will contribute to more inclusive growth by prioritizing support to small and marginal producers in the horticulture sector, with specific focus on fruit tree crops. The project will reach about 138,000 producers, covering over about 30,000 ha. In these project areas, the project will support the development of minor community irrigation systems, covering about 19,500 ha, to be managed by about 1,000 Water User Associations. It is expected to directly benefit: (i) horticulture based micro-small medium enterprises (MSMEs); (ii) members of farmer producer organizations; and (iii) producers accessing the supply chain infrastructure supported under the project. Of these beneficiaries at least 33 percent women beneficiaries are expected, both in on-farm and off-farm activities. Indirect beneficiaries will include those who witness technology demonstrations facilitated by the project, farmers whose produce goes through rehabilitated markets, and farmers accessing Negotiable Warehouse Receipt financing, etc. The project will target the roughly 88 percent of producers in Himachal Pradesh who are small and marginal, emphasizing improvements to their productivity, product quality, and cost efficiency. Rules, procedures, and guidelines will be employed to prevent possible elite capture.

The project will support gender inclusive strategies especially in the project intervention areas of (i) sustainable increase in productivity of fruit tree crops through technical training on grafting techniques, management of orchards, soil, nutrients, pests and diseases, extension approaches that are designed to target women; and (ii) entrepreneurial development through training, skill development and market linkages with specific focus on fruit processing (on job work to large processers), indigenous beekeeping for managed pollination services, etc. Project will also actively support participation of women in the decision making structure of farmer producer organizations and water user associations.

The main project components are: Component 1 (Horticulture Production and Diversification for US$85.50 million) aims to enhance horticultural competitiveness at the farm level by supporting

access to knowledge, technology and finance in order to increase long term productivity and farm incomes in an environment marked by changing market patterns and increased climate variability. Component B (Value Addition and Agro-enterprise Development for US$41.80 million) aims to improve value realization at the farm level, promote investments in agribusiness, fostering backward and forward linkages in the value chains for horticulture products, support supply chain infrastructure that prevents wastage and value erosion; and enable secondary and tertiary processing that create higher value for the produce. Component C (Market Development for US$22.60 million) aims to provide an improved platform for market-related information and intelligence, expand market access through alternative marketing channels, enhance transparency in the price discovery process, and improve market infrastructure. Component D (Project Management, Monitoring and Learning for US$17.0 million) will ensure the effective implementation of the project activities and monitor and evaluate project implementation progress, outputs and outcomes, building on implementation experience. The project will be financed through a seven year Investment Project Financing (IPF). The total project cost is US$167.0 million and will be funded by an IDA credit (US$135.0 million equivalent), and the GoHP (US$32.0 million equivalent).

Environment and Social Assessment

As part of project preparation, an Environmental and Social Assessment Study (IESA) had been undertaken with an aim to provide inputs into the design of HPHDP in accordance with the World Bank Operational Guidelines. It involved identification of key environmental and social issues arising out of the proposed Project activities and mainstream the social and environmental management measures in all stages of the project cycle. The study helped to develop an Environmental and Social Management Framework (ESMF) to ensure that: Environmental and social considerations are fully mainstreamed in project planning, implementation and monitoring; and potential adverse impacts are adequately mitigated and potential benefits of the project are further enhanced to improve the effectiveness and sustainability of the project.

Socio-Economic Baseline

Key findings from the ESA were: the total population of Himachal Pradesh is 68, 64,602 out of which 34, 81,873 were males (50.72%) and 33, 82,729 (49. 28%) were females (Census 2011[1]). Of the total population 89.97% live in rural areas. The proportion of SCs and STs in Himachal Pradesh is nearly 30 percent of the state's population much higher than the national average. Sex ratio is presently 972, which is better than the national average of 943. The state (0.652) occupies the third spot in respect of Human Development Indices, in the country. Also, despite being a predominantly rural society the literacy rate amongst males is nearly 90% and amongst females nearly 76%. Life expectancy at birth for the period 2006-10, the male life expectancy at birth was 67.7 years as compared to 72.4 years for females. It is 3.4 years longer than the national average. The Per Capita income percent in 2012-13 witnessed an increase of 11.4% over the previous year.

Out of the total geographical area of 55.67 lakh hectare the area of operational holdings is about 9.55 lakh hectares and is operated by 9.61 lakh farmers. The average holding size is about 1.00 hectare. Distribution of land holdings indicates that 87.95 percent of the total holdings are of small and Marginal[2]. Agriculture is the main occupation of the people of Himachal Pradesh. Increasingly most rural families have access to off farm incomes to supplement the shortfall from agriculture as the viability of holdings is gradually becoming more critical. Horticulture in the state has been

[1] http://www.census2011.co.in/census/state/himachal+pradesh.html

[2] Agriculture Census 2010-11; Economic survey of Himachal Pradesh (2014/15), Economics and Statistics Department.

responsible for many of the positive outcomes in employment, wages, and in turn, poverty reduction.

Status of Women and Tribals: Women constitute 49.28% -- nearly half of the state population. In terms of workforce participation, females constitute 44.82% of the total workforce. In Himachal Pradesh, number of women who had control over use of land resources was more than the male members of the family, because men stayed away from the villages for their livelihoods and attended farming operations seasonally. Women had higher responsibilities in backyard management including livestock and also attended more trainings in horticulture. The participation of women in development programs and their access to markets, services, and spaces is linked to a culture where female seclusion is not as normative as it is in neighboring states. 65 percent of urban women in Himachal Pradesh and 56 percent of rural women participate in household decisions[3]. In terms of political representation, elected women representative in the Panchayati Raj Institutions and urban local bodies have significantly increased due to good number of women which have actively entered in Politics in Himachal Pradesh. There are total of 10 communities as notified in State's Scheduled Tribes list namely, *Bhot, Bodh, Gaddi, Gujjar, Jad, Lamba, Khampa, Kanaura (Kinnaura), Lahaula, Pangwala and Swangala.* Major tribal areas in the state are Chamba, Kinnaur and Lahaul Spiti. The tribal population of H.P. are divided into three categories as under: a) Scheduled Tribes in Scheduled Areas, b) Modified Area Development Approach (MADA) that cover smaller areas of tribal concentration having 10,000 population in contiguous areas of which 50% or more were tribals; c) Dispersed Tribes Population: covering all tribal living outside the Scheduled Area and Modified Area Development Approach pockets.

Legal and Regulatory Framework

Project would be implemented with following key applicable acts, notifications, and policies: FRA, 2006, National Policy on Tribal Development, 1999, Panchayati Raj Act, PESA 1996, Right to Information Act, 2005,National Agricultural Policy, 2000, National Policy for farmers, 2007, The Himachal Pradesh Transfer of Land (Regulation) Act, 1968, Land Reforms Legislations - HP Village Common Land Vesting and Utilization Act,1974 and H.P. Tenancy and Land Reforms Act, 1972: Section 118 of Act Himachal Pradesh Tenancy and Land Reform Rules, 1975.Himachal Pradesh Lease Rules, 2013, The Himachal Pradesh Agricultural & Horticultural Produce Marketing (Development &Regulation) Act, 2005. World Bank' operational policies on OP 4.10 on Indigenous Peoples, Access to Information would be applicable as well.

Stakeholder Consultations

Stakeholder consultations were held with institutional stakeholders, potential Farmer Producer Organizations (FPOs), water user association, Non-Government Organizations (NGOs), women Self Help Groups (SHGs), Tribal Farmers, leaders, elected PRI leaders, , , Farmer Interest Groups(FIG), Cooperative societies small farmers. The purpose was to ascertain likely social and environmental issues that need to be addressed during project preparation, understand perceived benefits of the various interventions and elicit suggestions for incorporation in the project design. Key findings from these consultations were: a large number of farmers faced quality issues with the planting material and pesticides procured from government sources; irrigation infrastructure is the top most priority and demand for men and women alike; farmers expressed broad community support and high degree of willingness for provision of land for water schemes/citizen service centres; better market access and connectivity remains a serious constraint for backward areas; training and capacity building is a major requirement of farmers and entrepreneurs in remote areas; small and marginal

[3] NFHS-3 (IIPS 2010)

farmers have comparatively lower access to information and benefits of horticulture programs; strong capacity building and hand holding support would be needed for water user associations and farmer producer organiations envisaged under the project; women groups showed interested in undertaking vegetable cultivation and other income generation programmes as well as practical, field based training on Horticulture and Floriculture technology and markets. Women would also like to be trained on crop management practices and expect department to provide necessary support in terms of farm inputs and knowledge, training, exposure visits.

Key Environment and Social Issues

The planned project interventions include: area expansion for select fruits, rejuvenation and re-plantation (for Apples only), Progeny-Cum Demonstration Orchards (PCDOs), Bee keeping and in terms of infrastructure including upgradation or renovation or green-field: agri-processing centres, market yards, pack houses, Common Service Centres (CSCs), Controlled Atmosphere Storages (CAs). Government land available with HPMC or state government would be utilized for market yards, nurseries and packaging/processing infrastructure. Environment and Social Impacts, Risks and related Issues are summarized in Chapter 5.

The project has the potential for causing moderate to small adversely impacting the local environment if not appropriately designed, executed and/or operated. The anticipated impacts could arise due to: improper site selection and inadequate environmental management during construction of physical infrastructure, non-compliance with post entry quarantine regulations for imported root stocks, increased and indiscriminate pesticide, unsustainable and unbalanced water resource management practices, inadequate disposal and management of solid and liquid waste at the proposed agro-processing facilities, poor maintenance of infrastructure and improper land use, encroachment of forest areas.

The key social safeguard, social inclusion and gender priority for the project are: (i) ensuring identification and screening of tribal communities in project area, holding informed consultations and assessing broad community support with them; with ensuring their beneficial and continuous engagement in project planning, investment planning, in project supported institutions (FPO, WUA and CSC); (ii) screening, assessment and mitigation of any potential adverse impacts linked with the infrastructure subprojects, (iii) inclusion and tracking of small and marginal farmer beneficiaries under various project components, institutions (WUA, FPO, CSC) and departmental programmes; (iv) enhancing the representation and participation of women producers in FPOs, WUAs, pre- and post-harvest trainings; improving their skills and employability in horticulture/agriculture sectors; improving their access to government horticulture, agriculture and credit programmes (v) enhancing the outreach and information dissemination activities, specifically among small and marginal horticulture farmers; vi) and strengthening citizens engagement with horticulture department, its services and the project components, especially in the context of women, and small and marginal farmers.

Environmental Management Framework

The Environmental Management Framework (EMF) is developed to incorporate environmental and concerns into the main project planning, execution and operation... The EMF prepared for the project acknowledges environmental issues and risks and integrates the measures for addressing them in the project implementation process. The proposed project does not anticipate any expansion of orchard areas onto forest land, nor involve the felling of trees in any proposed construction. Activities such as supply chain infrastructure where environmental impacts will be seen as moderate to substantial (construction of higher production CSCs, CAs, sorting, grading,

packing and primary processing, market yards and effluent treatment plants) will require a project specific EIA/EMP for preparation, implementation and monitoring. Dust, noise and discharge & disposal of solid and liquid waste, land use management, improper storage of the crop are expected to be the chief environmental impacts. These subprojects will need to be on case to case basis once selected; based on which mitigation measures will be incorporated in the design stage itself by design consultant/service provider. The environmental management plan will also cover construction and operational phases of the subprojects.

Activities which are seen as having low- moderate impact will have Environmental Guidelines (EGs) incorporated in the design, implementation and management of these activities. This is applicable for interventions such as water management, beekeeping, demonstration sites (PCDOs), PEQ nurseries and CSCs. The project will also have a detailed focus plan on integrated Pest and Nutrient Management. Water harvesting structures and distribution will incorporate EGs for water use efficiency, sustainability, and soil and water conservation. These will be monitored by the community/cluster institution. Improved access to investments, inputs and markets for FPOs present opportunity for operating efficiency improvements. The producer company will develop business plans, based on which critical infrastructure will be plugged into the project. These will also need to be based on EGs to include measures for reducing environmental footprint.

For each stage, potential adverse environmental issues have been identified and mitigation measures proposed that have been integrated with the ESMF implementation process. The EMF Comprises of (i) Decision making for sub project categorization base on High or Low impact (ii) Mitigation measures for environmental impacts and risks identified through project design (iii) Environmental guidelines for low impact sub projects (iii) Integrated Pest Management Plan (iv) Guidelines for monitoring EMPs.

Social Management Framework

Impacts and risks in such potential investments and institutions would need to be mitigated through systematic prioritization and targeting, and citizen's engagement strategy. Hence, in order to address the key social safeguard, social inclusion, gender and citizen's engagement issues summarized above, ESMF comprises:

i) Social Inclusion strategy that includes mechanisms for targeting, prioritization and tracking of small and marginal farmers as project beneficiaries under all project components; as members, office bearers and management committee members of WUA, FPOs and CSC; norms/rules for equitable benefit sharing and avoidance of benefit capture in WUA, FPOs and CSC; communication and outreach activities on project services and departmental horticulture programmes;

ii) indigenous peoples planning framework (IPF) or Tribal Development Framework (TDF) that provides guidance on screening/identification of tribal communities in project areas, conducting informed consultations and documenting broad community support, inclusive planning and institution building processes, preparing area-specific tribal development plans (TDPs), and implementing socially compatible outreach and communication strategies;

iii) gender strategy that includes: targeting and inclusion of women producers in farmer interest groups, water user associations and common service centers; providing technical

knowhow, extension, and practical training on management of orchards, soil, nutrients, pests and diseases, nurseries; training and entrepreneurship promotion in indigenous beekeeping, vermi-composting, fruit processing, nursery management/development; participation of women producers in post-harvest management, fruit processing and market infrastructure/services; gender focused module as part of baseline study; well as other demand driven programs;

iv) Citizens Engagement Strategy that includes actions related to participatory planning and implementation for common service centers, community water schemes; use of ICT in beneficiary feedback, information dissemination, technical advice, demand estimation and grievance redressal; strengthened implementation of the citizens charter; monitoring beneficiary satisfaction;

Screening and Mitigation of potential adverse impacts caused by post-harvest infrastructure, CSCs and minor irrigation schemes. No compulsory private land acquisition would be done under the project. All identified sites for water schemes and post-harvest infrastructure would be screened for any adverse social impacts through a social screening checklist. Only sites without any encumbrances i.e. without encroachments or unauthorized occupation would be selected to site or undertake project infrastructure/interventions. For water schemes and CSCs, WUAs and FPOs would access land through lease deed, private market purchase agreement or MOU with panchayats

Institutional Arrangements

Overall management and coordination would be the responsibility of the HPHDP Society, a registered body established by GoHP to implement the project. The Project Coordination Unit would include a Social Development Coordinator and Social Development Specialist who would be responsible for design, implementation, monitoring and reporting of the social strategies included in the ESMF. The District Implementation Unit (DIU) would include a social development officer who would be supported by Horticulture Extension Officer (HEO) and Subject Matter Specialist (SMS) at the Block Implementation Unit (BIU), besides community mobilizers/facilitators.

Monitoring and Evaluation

M&E responsibilities would mainly rest with PCU that would be responsible for analysis of all project-level M&E information and generation of regular 6-monthly M&E reports; updating key performance indicators by consolidating the information provided by different implementing agencies and the external M&E agency; conducting independent field visits to monitor implementation and outputs of selected project activities; commissioning special M&E studies as needed; maintaining the Integrated Horticulture Management and Monitoring System (IHSMS); identifying bottlenecks and corrective actions, if needed; documenting success stories; regular reporting to the Project Management Committee and the Project Steering Committee; and six-monthly reporting to the World Bank on the project status. It would be supported by a M&E consultant whose responsibilities include: creation of an M&E framework for the entire HPHDP project define key process and performance monitoring indicators, data collection frequencies, and formats for collecting the relevant information; conduct the Baseline Survey for the project. In addition to the regular six monthly monitoring reports, there are two junctures during the project period where impact assessment studies will be undertaken by the M&E agency. These studies will evaluate HPHDP's performance and progress towards achieving the project's development objectives. The first impact evaluation would be at the time of the second mid-term review (II MTR) of the Project, and, the second impact evaluation around the time of the Project completion.

The social monitoring would involve: tracking of beneficiary farmers under project components disaggregated by gender, landholding and tribal status; socioeconomic profiling of households covered under TDP and other project interventions; periodic review of ESMF implementation; disaggregated data collection and analysis under baseline, impact evaluation and midterm studies (by gender, landholding and social groups; thematic study on women's work-time in horticulture (as part of baseline). Half yearly reports would be shared on ESMF Implementation, including preparation and implementation of EIAs, EMPs, TDPs and gender interventions.

Implementation Schedule

Key activities in respect of ESMF (and TDF) implementation include: initial establishment activities Setting up E&S Cell within PCU, PIUs; Engagement of Social Development Coordinator (government official), Social Development Specialist (SDS) in PCU and at DIUs & M&E specialist at PCU; operationalizing GRCs; contracting of M&E agency, operationalizing ICT enabled MIS system under citizen engagement strategy; development of socially inclusive criteria for selection of farmers within the Community Operations Manual, farmer clusters and its dissemination, Provision of orientation training on ESMF & TDF and safeguards, undertake Screening on identified land to ascertain impacts; identification of land and its take as required for project infrastructure. In case of activities under Tribal Development Framework, key activities would include: contracting of tribal development consultant, additional resource persons as necessary preparation of culturally appropriate materials, conducting of FPICs, etc.

Budget

The budget for ESMF comprises costs for i) engaging Environment and Social specialists; ii) engaging external resource persons/agencies for preparing EIA/EMPs and Tribal Development Plans (TDPs) and supporting their implementation, including specific women focused interventions; iii) conducting trainings and capacity building activities related to ESMF, including dedicated modules for women farmers; iv) ; vi) area-specific investments identified by tribal communities under the TDP; thematic studies on gender, and conclusions. These costs have been budgeted as part of the overall project costs.

Cost of implementing the IPM has been factored into the overall cost of component A. The additional funds required to hire external consultants to prepare EIA and EMPs for high impact sub projects has also been accounted for in institutional support. Cost of implementation of TDF including conducting FPICs, preparation of IEC materials, Training and Exposure visits, External consultant to provide support in preparation of TDPs (for 2-3 years), additional resource persons, specific project investments, feasibility study on organic GI certification and provision of funds for meeting any special community, as identified are included in the TDF budget.

Disclosure

The draft ESMF report will be disclosed on the website of the Department of Horticulture, the World Bank's InfoShop and a summary will be circulated among the primary stakeholders before appraisal. An ESMF disclosure workshop is also planned to be conducted during the Appraisal mission (18-22 January 2016)

Grievance Redressal

The Executive Committee of the FPO/WUA would be the first level of handling grievances to which any aggrieved person or complainant would report his grievance. The Committee would be responsible to maintain a grievance register. The next level headed by the BDO would be responsible to provide necessary support to resolution by appropriate liaising with relevant departments -

horticulture, agriculture, irrigation, etc. The next level would be District Level Coordination Committee headed by Deputy Commissioner and comprising senior functionaries from other line departments. Finally, at the state level, the GM (Technical & HRD) in the PCU and the Nodal Officers of PIUs will be appointed PIO's or any other officers already appointed in implementing line departments. Similarly, PD in PCU and the Heads of the Departments would be the Appellate Authorities to decide upon the appeals pertaining to RTI.

1.0 – HIMACHAL PRADESH HORTICULTURE DEVELOPMENT PROJECT

1.1 Project Context

The Government of India (GoI) recognizes the important role of agriculture in the ongoing rural-urban transformation process and the potential it represents as an important source of growth and job creation. The GoI also recognizes the necessity of strategic shifts for structural transformation of Indian agriculture to tap into this potential of growth and job creation. These shifts reflect underlying trends in demand for food and factors affecting the supply of agriculture produce and include: (i) a shift away from a focus on food grain production towards diversification into high value agriculture production of fruits, vegetables, dairy, etc.; (ii) a shift away from a focus on on-farm production towards value addition in the post-harvest segments of agriculture value chains; (iii) a shift away from a focus on productivity towards resilience of agriculture production systems for addressing the effects of climate change; and (iv) a shift away from a focus on agriculture production towards nutrition sensitive agriculture. To facilitate these four shifts, GoI has launched several policies and initiatives since 2014.Indian agri-food system is undergoing a major transformation. First, organised retail including e-retail, giving consumers a wider choice of goods, more convenience, and often lower prices, is rapidly growing. It is expected that the benefits of this trend should percolate to the mass of Indian consumers. Second, changes in consumption patterns are driving fast changes in the production basket. The production basket is diversifying in favor of high value commodities (fruit, vegetables, livestock and fisheries) in response to the changing consumer tastes and preferences. This has set the stage for expanding and modernizing handling, storage and distribution networks.

The state of Himachal Pradesh (HP) is characterized by a significant number of opportunities in high-value commodities. These include, most importantly, diversity in agro-climatic conditions, possibilities to produce for 'off-season' markets, relative high education of producers, and a location relatively close to terminal consumer markets. The state's agriculture is dominated by high value horticulture commodities, which account for about 44 percent of the cropped area and contribute about 48 percent of agricultural gross state domestic product (GSDP). The state has emerged as a leading producer of fruits and offseason vegetables. Horticulture sector annually contributes INR 63,000 million (US$ 1051 million) to the state economy, which is about 7 percent of the GSDP. Horticulture in HP has been responsible for many of the positive outcomes in employment, wages, and in turn, poverty reduction. Notwithstanding the significant potential of horticulture production in HP to contribute to higher economic growth and poverty reduction objectives, the state faces a number of sectoral, institutional and policy challenges which need to be addressed systematically if the potential is to be realized and translated into a sustainable development impact. This sector is also faced with competitiveness challenges, as its domestic markets are opened to international trade.

The project will support interventions designed to help the horticulture sector improve productivity and build resilience against weather-related shocks, while improving market access to provide incentives for growers to produce as per the market need. The project activities will focus on resolving the binding constraints on productivity, quality, value-addition and market linkages. By doing so, it will contribute to the key aspects of the GoI's, GoHP's and the Bank's CPS strategic objectives related to faster and broader agriculture sector growth and inclusive development. The project will achieve the PDO by: (i) improving producer's access to knowledge and horticulture production technologies (including climate resilient technologies), and access to finance so that they are able to respond to climate variability and emerging market opportunities; (ii) promoting

investments in agribusiness, fostering backward and forward linkages in the value chains for horticulture products, piloting negotiable warehouse receipts for horticulture commodities, and facilitating access to finance for agribusiness enterprises, including collectives such as producer companies; and (iii) supporting the development of an improved platform for market-related information and intelligence, developing new e-market channels outside of regulated markets, and improved services provided by modernizing the promising traditional wholesale markets.

1.2 Project Description

In consideration the existing scenario of horticulture industry in the State, with regard to declining productivity of Apple and other fruit crops, poor post-harvest handling and marketing infrastructure, the development of horticulture in Himachal Pradesh is envisaged with the assistance of World Bank funded **Himachal Pradesh Horticulture Development Project (HPHDP**). The project will lay emphasis on enhancing the livelihood of small and marginal farmers by increasing the fruit production and productivity by intensification, crop diversification (among fruits and varieties), area expansion(bringing new area under horticultural cops) improving the processing infrastructure and backward and forward market linkages for improving the marketing of horticulture produce. The project will also bring in the latest technology for the production and post-harvest handling and marketing of horticulture produce and will transfer the same to the technical staff of Horticulture Department and other line departments and ultimately to the end user through capacity building by hiring the international consultants/ experts under the project.

The proposed project development objective (PDO) is to increase the "productivity, profitability, and market access of selected horticulture commodities in Himachal Pradesh".

The project aims to address key well known gaps and deficiencies in the horticulture sector in Himachal Pradesh and transform the sector (and the overall rural economy) to being more productive, efficient and profitable. By doing so, it will contribute to the key aspects of GoHP and the Bank's strategic objectives related to faster and broader agriculture sector growth and inclusive development.

Project Beneficiaries. The project beneficiaries will include farmers and entrepreneurs especially in the MSME segment. Others would include farmer producer organizations, and other value chain participants. The project would contribute to more inclusive growth by prioritizing support to small and marginal producers in the horticulture sector, with specific focus on fruit tree crops. The project would reach to about 138,000 producers, covering over about 30,000 ha, for sustainable increase in productivity of fruit tree crops. In these project areas, the project would support the development of minor community irrigation systems, covering about 19,500 ha, to be managed by about 1000 Water User Associations. Furthermore, the project is expected to directly benefit: (i) horticulture based micro-small medium enterprises (MSMEs); (ii) members of the farmer producer organization; and (iii) producers accessing the supply chain infrastructure supported under the project. Of these beneficiaries at least 15 percent women beneficiaries are expected, both in on-farm and off farm activities. Indirect beneficiaries would include: those who witness technology demonstrations facilitated by the project, farmers whose produce goes through rehabilitated markets, farmers accessing Negotiable Warehouse Receipt financing etc. Though the majority of producers are de facto small and marginal in the state (about 88 %), project would target this category of producers to improve their productivity, product quality, and cost efficiency. The project has also put in place rules, procedures, and guidelines to prevent possible elite capture.

The project aims to achieve the proposed PDO by; i) Increasing the area under improved clonal rootstocks and cultivars of selected horticultural crops ii) Improving the producers' access to knowledge and climate resilient production technologies so that producers are able to respond to

climate changes and climate variability and emerging market opportunities. Iii) Promoting investments in agribusiness, fostering backward and forward linkages in the value chains for horticultural products, facilitating access to finance for agribusiness entrepreneurs, and, where appropriate, push for process, regulatory and/or policy change. Iv) Supporting the development of an improved platform for market related information and intelligence, alternative market channels development outside of regulated markets, piloting negotiable warehouse receipts for horticulture commodities and improved services provided by modernising the traditional wholesale markets.

The total project cost for this seven year is US$ 169.0 million and would be funded by IDA credit (US$ 135.0 million equivalent), the GoHP (US$ 34.0 million equivalent), and a beneficiary contribution (US$ XX million equivalent – to be determined)

1.3 Project Components and Objectives

In line with the PDO, the project would have the following four components as presented in **Table 1:**

Table 1 Project Components and Interventions

Component	Objectives	Planned Interventions
A. Horticulture Production and Diversification	to enhance horticultural competitiveness at the farm level by supporting access to knowledge, technology and finance in order to increase long term productivity and farm incomes in an environment marked by changing market patterns and increased climate variability	(i) enhancing producer's access to disease free elite planting materials; (ii) supporting sustainable intensification and diversification of horticultural production through technology and knowledge transfer, including harvest, capture, collection, delivery and distribution of water; and (iii) Strengthening applied research and development; and enhancing the access to finance to producers.
B Value Addition and Agri-enterprise Development	improve value realization at the farm level, promote investments in agribusiness, fostering backward and forward linkages in the value chains for horticulture products, support supply chain infrastructure that prevents wastage and value erosion; and enable secondary and tertiary processing that create higher value for the produce	(i) building community/farm level marketing capacities and supporting them through matching grants to acquire productive assets; (ii) establishing a modern supply chain comprising pack-houses, controlled atmosphere (CA) stores, and processing facilities to be operated under Public Private Partnerships (PPP) arrangement; (iii) providing access to warehouse receipt systems linked to commodity exchanges; identifying, mobilizing and supporting agro entrepreneurs; (iv) Facilitating access to finance for agribusiness enterprises, including collectives such as producer companies.
C. Market Development	to provide an improved platform for market-related information and intelligence, expand market access through alternative marketing channels, enhance transparency in the price discovery process, and improve market infrastructure	(i) supporting market information and intelligence services; (ii) introducing of e-marketing platforms; and (iii) upgrading wholesale markets.
D. Project Management, Monitoring	ensure the effective implementation of the project activities and monitor and evaluate project implementation	support: (i) establishment and operations of Project Coordination Unit (PCU), which will oversee

Component	Objectives	Planned Interventions
and Learning Project Management, Monitoring and Learning	progress, outputs and outcomes, building on implementation experience.	and coordinate activities of the implementing agencies of the project; (ii) establishment and operations of Project Implementation Units in the respective implementing agencies; and (iii) setting up of a monitoring and evaluation (M&E) system for the project, including a project management information system and contracting an external M&E agency to monitor project activities and impact. It will also finance dedicated staffing for the project activities that are attributable to the outcomes of the project, consultancies, training and related material, office equipment, and operational costs.
		Source: Project Implementation Plan, HPHDP, 2015

1.4 Project Implementation Areas

The project would be implemented over a period of seven years. Although the project would cover the entire state (12 districts), the intensity of activities in each district would depend on the existing production potential. Major proportion of the interventions are proposed in Shimla, Kullu, Kinnaur, Chamba and Mandi districts, followed by Kangra, Una, Siramaur, Lahaul-Spiti, Una Bilaspur, and Hamirpur.

1.5 Environment and Social Safeguard Framework (ESMF)

As part of project preparation, the project coordination unit has undertaken an Environmental and Social Assessment exercise to provide inputs into the design of HPHDP in accordance with the World Bank Operational Guidelines. It involved identification of key environmental and social issues arising out of the proposed Project activities and mainstream the social and environmental management measures in all stages of the project cycle. The study helped to develop an Environmental and Social Management Framework (ESMF) to ensure that:

The study supported the development of an Environmental and Social Management Framework (ESMF) to ensure that:

(i) Environmental and social considerations are fully mainstreamed in project planning, implementation and monitoring; and
(ii) potential adverse impacts are adequately mitigated and potential benefits of the project are further enhanced to improve the effectiveness and sustainability of the project.

The term ESMF is used by the World Bank to depict operations with multiple subprojects, various phases and spread over a long period of time. The ESMF is a requirement for HP HDP under the Banks OP/4.01 due to the following features:

(i) A number of subprojects and components
(ii) Subprojects spread over a wide geographical area
(iii) Implementation phases spread over years
(iv) Design of subprojects, exact locations as well as impacts are not determined at this stage

Subprojects are classified based on low and high impact for specific attributes listed in the report and based on that their eligibility for support under the project will be decided. Any project activity

resulting in physical displacement or significant conversion or degradation of critical natural habitats would be ineligible for support through the project.

The Environmental Management Framework (EMF) is developed to incorporate environmental and social concerns into the main project planning, execution and operation. It will be applied to all the sub-projects in different stages of the project cycle. The framework has been developed considering three broad stages of project cycle viz. project preparation, project implementation and project operation. For each stage, potential adverse environmental and social issues have been identified and mitigation measures proposed that have been integrated with the ESMF implementation process. The ESMF also incorporates key issues pertaining to tribal development, gender equity, citizen's engagement, use of pesticides, capacity building and institutional arrangement.

1.6 Methodology of ESMF Preparation

The methodology to prepare theESMF involved the following

(i) a review of the project component and activities proposed in the project implementation plan of HPHDP;

(ii) a desk review of relevant literature including laws, regulations, guidelines; and key policies across the state relevant to project implementation. Specifically legal and regulatory provisions of GoI, World Bank and GoHP.

(iii) Review of relevant plans and Bank supported projects such as: HP Mid Himalayan Watershed Development Project, Maharashtra Agriculture Competitiveness Project (MACP), , secondary data and reports such as Agriculture Survey, Socio-economic survey of Himachal Pradesh, Himachal Pradesh State road project, State of the Environment Report, 2014 and other similar projects conducted by Governments and donor agencies such as Crop Diversification Promotion project.

(iv) Interactions with institutional stakeholder such as: Directorate of Horticulture, Regional Horticulture Research and Training Station Mashobra, HPMC center at Jarol Tikkar Shimla district, a potential FPOs - a Floriculture and Vegetable Producers Association and a Water User Association. Subsequently field level (Block and Village) interaction were held including representatives such as Horticulture Development Officer(HDO), Horticulture Extension Officer(HEO), Subject Mater Specialist(SMS),Block Development Officer(BDO), besides Farmers Producer Organization(FPOs), Non Government Organizations (NGOs), women members of Self Help Groups (SHGs), Tribal Farmers, leaders, elected PRI leadersWater User Association (WUA), Krishi Vikas Sangh(KVS)members, Farmer Interest Groups(FIG), Cooperative societies small farmers. The purpose of these interactions was to ascertain likely social and environmental issues that need to be addressed during project preparation; understand current practices from production to marketing, validate findings from desk reviews, understand perceived benefits of the various interventions, awareness regarding government schemes, constraints faced, and prevalent government schemes.

(v) review of environment and social baseline of the state

(vi) Comments, suggestion, views and concerns if any appropriately were incorporated in the final ESMF report.

1.7 Structure of Report

ESMF report is broadly divided in four sections as presented below:

Section A presents the following

- existing Environment and Social Baseline in respect of land use pattern, climate, forest covers, water resources, demographic profile, economy, Tribal areas, land holding, occupation, literacy level;
- legal and regularly framework that is applicable to the project;
- findings and outcome of the consultation/interaction undertaken as part of project and ESMF preparation; and
- expected environmental and social impact that are likely to arise from project activities and different component and their proposed mitigation measures.

Section B presents the Environment Management Framework which includes Scope of Application of EMF, Categorization of interventions based on environmental impacts,; environmental Guidance, Stage of Application & Responsibility, IPM, IPNM Plan, EMF approach in the various stages of the project cycle - Planning, Design, Operation & maintenance.

Section C presents the Social Management Framework which includes Tribal Development Framework, Gender Strategy, Citizens Engagement Framework and Grievance Redressal Mechanism and Social Inclusion Strategy.

Section D presents the Institutional and Implementation Arrangement which includes Institutional Arrangements at in the Project and Key E&S staff, Environment & Social Monitoring and Reporting arrangements, Capacity Building and Training Plan, Mapping ESMF Implementation to Project Yearly cycle, ESMF Budget

SECTION A

ENVIRONMENT AND SOCIAL ASSESSMENT

2.0 ENVIRONMENTAL AND SOCIAL BASELINE

2.1 Overview Himachal Pradesh

The state of Himachal Pradesh is divided into four agro climatic zones viz, Shivalik Zone, Mid-Hill Zone, High hill zone, Trans Himalayan zone ranging from up to 200m in valley areas to 3600 m in Lahaul-Spiti and Kinnaur. The climatic conditions are sub-tropical to Dry and extremely cold conditions. The average rainfall ranges from 500mm in Trans Himalayan zone to upto 3000mm in mid hill zone. The cultivated areas are naturally high in the valley with 55% and least at Trans Himalayan zone at 5%. Due to extreme variation in elevation, great variation occurs in the climatic conditions of Himachal. The climate varies from hot and sub humid tropical in the southern tracts to, with more elevation, cold, alpine, and glacial in the northern and eastern mountain ranges. The state has areas like Dharamsala that receive very heavy rainfall, as well as those like Lahaul and Spiti that are cold and almost rainless.

The Satluj, Beas, Ravi, Chenab, Spiti, Parbati, Pabbar, Tons and Giri are the main rivers of Himachal Pradesh. Of these, the Satluj, which rises in the highlands of Tibet, is an antecedent river. Most of the rivers flow following the trend of the main structural grain of the region. Nearly 17% of the total area of Himachal Pradesh is covered by glaciers. There are a number of small and large lakes in Himachal Pradesh. Most important representing the water budget for the state are 21. These are in Kullu (Bhrigu, Dashair, Seruvalsar, and Mantalai), Mandi (Rewalsar, Prashar), Kangra (Dal, Kareri, and Pong Dam), Nako in Kinnaur, Surajtal and Chandertal in Lahul-Spiti, Chamba (Khajiar, Mani Mahesh, Gadhasaru, Gauri Kund, Lam Dal Lake, Mahakali, and Khundi Maral), and Renuka in Sirmaur and Chandernaun in Shimla. The project would utilize water of the run off origin and not expected to affect the surface water courses at large

There is no district notified as critically exploited or over exploited out of 12 districts of Himachal Pradesh as per CGWB. The groundwater resources occur mainly in Kangra, Una, Hamirpur, Bilaspur, Mandi, Solan and Sirmaur districts, particularly their valley areas. The exploitation is done through open wells, tube wells, infiltration galleries and wells. No area is critically polluted as per CGWB records. The ground water may have an impact during project progress as the pesticides and fertilizers may percolate through the ground water to affect them mainly in the valley area.

Pong dam and Chandra Tal situated in Kangra and Lahul and Spiti districts respectively are two wetlands covered under Ramsar convention. There would be no impact on these wetland of the project activity. According to National Forest Policy, 1988, at least two third i. e 66.6% of the geographical area should be under forest in the hilly states like Himachal Pradesh. Keeping in view, out of 55,673 sq. km area, the 10000 sq km is available for agricultural and horticultural activities. The total area is expected to be covered is nearly 5-6% of the total available agricultural area. Himachal is said to be the fruit bowl of the country, with orchards being widespread. Meadows and pastures are also seen clinging to steep slopes.

Government of Himachal Pradesh has declared several areas, covering all the agro-climatic zones in the state and having significant ecological, geomorphologic and biodiversity value, as Conservation

Reserves, Wildlife Sanctuaries and National Parks. There are 2 National Parks, 30 Wildlife Sanctuaries and 3 Conservation Reserves. No project component has any risk to affect the reserve areas during its life cycle.

However HP has rich floral and faunal resources. At lower elevations both tropical and subtropical dry broadleaf forests and tropical and subtropical moist broadleaf forests are found. These are represented by Upper Gangetic Plains moist deciduous forests, Sal and shisham are found here. The hills contain have Himalayan subtropical pine forests. Various deciduous and evergreen oaks live in the broadleaf forests, that include East Himalayan fir, West Himalayan spruce, deodar (the state tree), and blue pine. The uppermost elevations have western Himalayan alpine shrub and meadows in the northeast and north western Himalayan alpine shrub and meadows in the northwest. Trees are sturdy with a vast network of roots. Alders, birches, rhododendrons and moist alpine shrubs are there as the regional vegetation. Himachal Pradesh has around 463 bird and 359 animal species, including the leopard, snow leopard (the state animal), ghoral, musk deer and western tragopan. Since the project is not supporting the tree cutting as well as acquisition of forest land there is no effect on that. No forest produce would be utilized by the project component at any stage of the execution.

Use of pesticides in the agriculture and horticulture sector poses a serious environmental and public health problem. According to the study based on the farmers of Kullu and Shimla district of Himachal Pradesh in India. At present, India is the largest producer of pesticides in Asia and ranks twelfth in the world for the use of pesticides with an annual production of 90,000 tons. A vast majority of the population in India (56.7 %) is engaged in agriculture and is therefore exposed to the pesticides used in agriculture as well as horticulture.

2.2 Socio-Economic Baseline

Sections below present the social baseline of the state in respect of its population, human development indicators, literacy, status of women and tribals,

2.2.1 Overall

Population and density: The total population of Himachal Pradesh is 68, 64,602 out of which 34,81,873 were males (50.72%) and 33,82,729 (492,8%) were females. Of the total population of Himachal Pradesh state, 6,176,050 i.e. around 89.97 percent live in the villages of rural areas. In actual numbers, males and females were 3,110,345 and 3,065,705 respectively. Though the population has been increasing continuously over the years, growth rate of total population shows a decreasing trend over the last three decades. 10.03% people live in urban regions. However, the percentage share of urban population has been increasing continuously over the previous years with figures of 7.61% in 1981 to 10.00% in 2011 (Census, 2011). The proportion of SCs and STs in Himachal Pradesh is much higher than the national average as when combined they comprise nearly 30 percent of the state's population. In terms of population density per square kilometer of area, it has nearly doubled over the last forty (40) years. As per Census 2011, it is 123 which is almost double 62 in the year 1971. Hamipur (407), Una (338), Bilaspur (327), Solan (300), Kangra (263) Shimla (159) are some more densely populated districts of the state. Kinnaur (13) and Lahaul Spiti (2) districts have the least population density.

Poverty: A sharp decline in poverty heralded the greatest change towards social inclusion in Himachal Pradesh. This occurred especially in rural areas, where over 90 percent of the state's population lives. Between 1993–94 and 2011, rural poverty in Himachal Pradesh declined from 36.8 percent to 8.5

percent— a fourfold decline, impressive by any standard. While rural poverty continued to decline after 2004, urban poverty changed only marginally between 2004 and 2011. This poverty decline moreover, benefitted all social groups across rural and urban areas.

Sex ratio: Sex ratio of the state indicating the number of women per 1000 men (sex ratio) is presently 972, which is better than the national average of 943. Barring a few decades in the last 100 years, sex ratio has improved continuously in the state. Within the state amongst the districts, Hamipur (1095), Mandi (1007), Kangra (1012) Chamba (986), and Bilaspur (981) have a higher sex ratio than the state figure.

Distribution of population by Religion: In respect of religion, Hinduism is main religion with 95.17 % followers, followed by Islam, Sikhism and Buddhism. Other religions, Christianity, Jainism comprise rest. Approximately 0.12 % have 'No Particular Religion'. **(See Figure 2.1)**

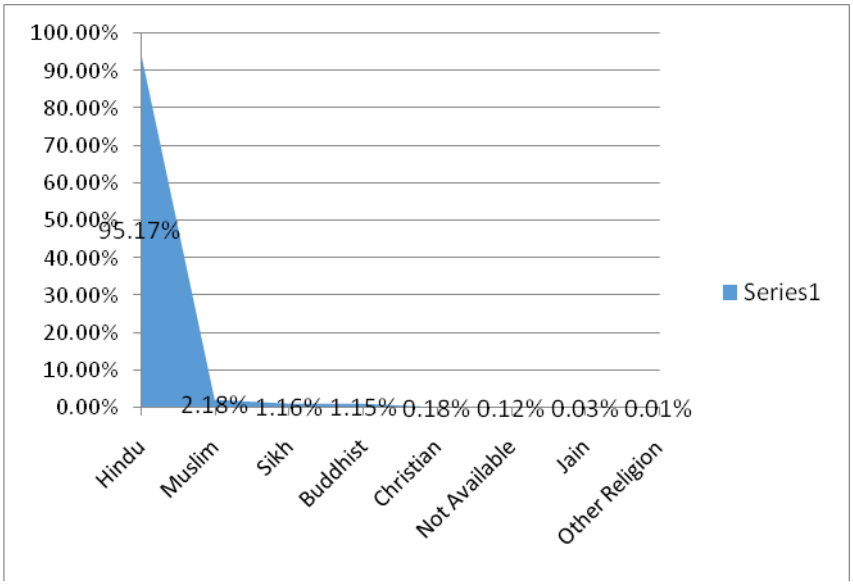

Figure 1 Distribution of population by religion

Human Development Indices[4]: According to India Human Development Report, 2011[5], the state (0.652) occupies the third spot in the first five i.e. after Kerala and Delhi and before Goa and Punjab.

Literacy rate. Despite being a predominantly rural society with only 10 percent of population living in urban areas, the literacy rate amongst males is nearly 90% and amongst females nearly 76%. Overall literacy rate of the state is 82.80 - a significant increase from 4.8% in 1951. Districts of Hamirpur, Una, Bilaspur, Kangra, Solan and Shimla have higher literacy rates than the state average. Chamba -- a district with a larger proportion of tribals has the lowest literacy rate at 72.17%. Amongst these districts, higher literacy rates in females are recorded in Hamirpur, Una, Kangra, Shimla and Solan

[4]*The Human Development Index (HDI) is a composite index of outcome indicators in three dimensions: a. A long and healthy life, as reflected in life expectancy at birth. b. The acquisition of education and knowledge, as reflected in the mean years of schooling (adjusted for out of school children) and literacy rate (age 7 years and above). c. The standard of living and command over resources, as reflected in the monthly per capita expenditure adjusted for inflation and inequality.*
[5]*India Human Development Report, 2011 Towards Social Inclusion*

Table 2 District wise Literacy rates segregated by sex

District	Total	Male	Female
Bilaspur	84.59	91.16	77.97
Chamba	72.17	82.59	61.67
Hamirpur	88.15	94.36	82.62
Kangra	85.67	91.49	80.02
Kinnaur	80	87.27	70.96
Kullu	79.4	87.39	70.91
Lahaul-Spiti	76.81	85.69	66.84
Mandi	81.53	89.56	73.66
Shimla	83.64	89.59	77.13
Sirmaur	78.8	85.61	71.36
Solan	83.68	89.56	76.97
Una	86.53	91.89	81.11
Overall state	**82.8**	**89.53**	**75.93**
			Source: Census of India, 2011

Life Expectancy at birth: Life expectancy at birth has increased continuously over years. For the period 2006-10, the male life expectancy at birth was 67.7 years as compared to 72.4 years for females. It is 3.4 years longer than the national average

Per Capita income: The Per Capita Income at current prices witnessed an increase of 11.4 percent as it increased to `95,582 in 2013-14 from `85,792 in 2012-13. The increase in total State Domestic Product is mainly attributed to 15.3 percent increase in Primary sector, 9.8 percent in Community & Personal Services sectors, 2.6 percent in Transport and Trade, 4.5 percent in Finance & Real estate. Whereas the Secondary sector increased by only 2.6 percent. Food-grains production, which was 15.41 lakh MT during 2012-13 has increased to 15.76 lakh MT during 2013-14 and is expected at 16.20 lakh MT (anticipated) in 2014-15. The fruit production has also increased by 55.8 percent i.e. from 5.56 lakh MT in 2012-13 to 8.66 lakh MT in 2013-14 and during 2014-15 (up to December, 2014) production was 6.53 lakh MT.

Economy: The economy of the state has transformed rapidly from the most backward State of India to one of the most advanced State. The pace of such transformation has emerged Himachal Pradesh as a leader in Hill Area Development. Himachal is an ideal destination for investment in Power and Tourism sector. Responsive administration and conducive macro-economic conditions have induced a competitive environment in the economy of Himachal Pradesh. The economy of the state is expected to achieve a growth rate of 6.5 percent in the year 2014-15. Gross State Domestic Product is defined as the aggregate of the economic value of all goods and services produced within the geographical boundary of the State counted without duplication with reference to a specified period of time usually a year. The State Gross Domestic Product (GSDP) at factor cost at constant (2004-05) prices in 2012-13 is estimated at `44,480 crore as against`41,908 crore in 2011-12 registering a growth of 6.1 percent during the year as against the growth rate of 7.3 percent during the previous year. At current prices, the GSDP is estimated at` 73,710 crore as against 64,957 crore in 2011-12 showing an increase of 13.5 percent during the year.

Workforce participation: The working population and work participation rate highlights the occupational distribution of a region. The information is essential for calculating state domestic product at factor cost popularly known as “State Income” for important tertiary sectors by adopting statistical methods of interpolation/extrapolation. As per Census2011, 30.05 percent of the total

population are classified as main workers, 21.81 percent marginal workers and the rest 48.15 percent as non-workers of the total workers (Main+ Marginal) 57.93% are Cultivators and 4.92 percent agricultural labourers, 1.65 per cent are engaged in household industry and 35.50 per cent in other activities. As per Census 2011, Himachal Pradesh have the highest cultivator workforce (57.93%) following by Other Worker category (3.50%). Higher percentage of cultivators amongst total workers are recorded in Kullu, Chamba, Bilaspur and Sirmaur reflecting agriculture as the major occupation in these districts. As per Census 2011, Kinnaur have the highest workforce (66.90%) and Una have the lowest workforce participation (41.32%). Employment rates in Himachal Pradesh are so muchhigher than in other states is that agriculture is still the mainstay of HimachalPradesh's largely rural economy, and predominantly agricultural economiestend to have higher labor force participation rates. About 70 percent of the state's employment is in agriculture and rural economyas in many other states, the construction sector has been another key agentfor growth and jobs in Himachal Pradesh. It employed large numbers of workersbetween 1983 and 2004, despite slowdowns in 2004 and again after 2009(figure 2.7). At almost 16 percent, Himachal Pradesh has one of the highestshares of workers in the construction industry

District wise workforce participation ratesare given in Figure 2Workforce participation by Districtbelow:

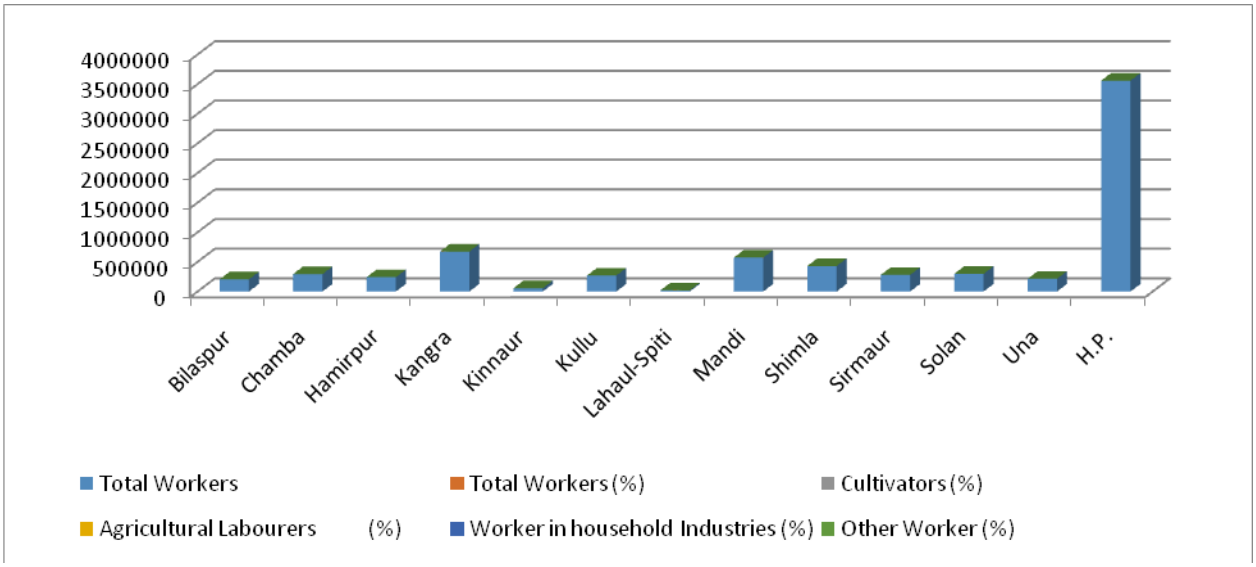

Figure 2Workforce participation by District

*Land holdings:*Himachal Pradesh has the highest proportion of the population (90% as per the latest census) in rural areas. Out of the total geographical area of 55.67 lakh hectare the area of operational holdings is about 9.55 lakh hectares and is operated by 9.61 lakh farmers. The average holding size is about 1.00 hectare. Distribution of land holdings according to 2010-11 Agricultural Census shows that 87.95 percent of the total holdings are of small and Marginal. About 11.71% of holdings are owned by Semi Medium and Medium farmers and only 0.34% by large farmers

Table 3 Distribution of Land Holdings

Size of Holdings	**Category (Farmer)**	**No. of Holdings**	**Area**	**Av. Size of Holding**

(Hect.)		(Lakh)	(Lakh Hect.)	(Hect.)
Below 1.0	Marginal	6.70 (69.78%)	2.73 (28.63%)	0.41
1.0-2.0	Small	1.75 (18.17%)	2.44 (25.55%)	1.39
2.0-4.0	Semi Medium	0.85 (8.84%)	2.31 (24.14%)	2.72
4.0-10.0	Medium	0.28 (2.87%)	1.57 (16.39%)	5.61
10.0-Above	Large	0.03 (0.34%)	0.51 (5.29%)	17.00
Total		**9.61**	**9.55**	**1.00**
Source: Economic Survey of Himachal Pradesh 2014-15				

*Agriculture:*Agriculture is the main occupation of the people of Himachal Pradesh and as one of the important activities of state economyand this sector of the economy, which comprises agriculture, horticulture and livestock production accounts for the largest single share in the state domestic product (GSDP). About 15 percent of the total GSDP comes from agriculture and its allied sectors. Average yields are comparable with other hill states but is much lower than the states in the plains. Most of the agriculture is subsistence type and depends on the climatic conditions for good harvestsCultivable area in the state accounts for nearly 15 % of the total geographical area and out of this, only 10 % is under plough and is being tilled by 9,60,765 land holders (2010-11 Census). Till 2014, irrigation potential has been created for an area of about 2.6 lakh ha, but, only 1.06 lakh ha is being provided with assured irrigation facility; which is nearly 20% of the net area sown.

A large proportion of the population depends upon agriculture for their livelihood as provides direct employment to about 70 percent of total workers of the State.Smallholdings have become gradually uneconomical. The reasons are primarily the size (70% with less than 1 ha), rain fed farming and high cost of inputs. The viability of holdings is gradually becoming more critical due to the progressive fragmentation of the holdings through inheritance.These conditions make the agricultural based economy inadequate to fulfil the total livelihood for majority of the families. Increasingly most rural families have access to off farm incomes to supplement the shortfall from agriculture.

*Horticulture:*Horticulture in HP has been responsible for many of the positive outcomes in employment, wages, and in turn, poverty reduction. The rich diversity of agro climatic conditions, topographical variations and altitudinal differences coupled with fertile, deep and well drained soils favour the cultivation of temperate to sub-tropical fruits in Himachal. The region is also suitable for cultivation of ancillary horticultural produce like flowers, mushroom, honey and hops. This particular suitability of Himachal has resulted in shifting of land use pattern from agriculture to fruit crops in the past few decades. Further, the growing agribusiness sector in Himachal Pradesh has had positive job outcomes. Himachal Pradesh has been known for its apples and other fruits, but it recently also ranks as one of the major flower producing states. Ancillary products, such as mushrooms, ginger, honey and hops, too have become popular, helping local village economies. As a result of a growing demand and state intervention, jobs in horticulture as a percent of all agricultural jobs increased from 0.9 percent in 1983 to 28 percent in 2009–10. Crop diversification has made a significant impact on income and employment of small and marginal farmers. Also, the proportion of area under non-food grain crops was a significant factor influencing the growth of rural non-farm employment in the state. . The area under fruits, which was 792 hectares in 1950-51 with total production of 1,200 tons increased to 2, 18,303 hectares during 2012-13. The total fruit production in 2012-13 was 5.56 lakh tons, which during 2013-14 (up to December, 2013) has been reported as 8.28 lakh tones.

Government provides support to agriculture and horticulture vide many schemes that provide varying levels of subsidies to different social groups.

2.2.2 Status of Women

Women 33, 82,729 (49.28%) constitute nearly half of the state population 68, 64,602. Other parameters are presented below:

Sex ratio: Although some group based disparities exist, the state has a better female to male ratio (972) than the national average 943. The censusresults of 2011 has shown an increase in sex ratio by 4 points i.e. 968 to 972 and asregards sex ratio (0-6) years it has improved in Himachal Pradesh i.e. from 896 to909 during 2001 to 2011 Census. The sex ratio is high in Himachal Pradesh ascompared to neighboring states of Punjab (895), Haryana (879) J&K (888), Uttarakhand (963).

Literacy: Literacy rate of women in the HP in the state is high at 75.93% and the state is ranked 12th in the country in this respect. It compares favorably with other hilly states such as Sikkim and Nagaland and is better than the national rate of 65.46%. Districts in the state with a higher rate than the state rate are Hamirpur (82.62%), Una (81.11%), Kangra (80.02%), Bilaspur (77.59%), Shimla (77.13%) and Solan (76.97%). In case of Scheduled tribes too, literacy amongst females is 64.2%, close to the national average.

*Health Status:*Health of women is an important factor in determining the overall healthof the society. If pregnant women are not well nourished they are more likely to givebirths to weaker babies leading to a higher infant mortality rate. It is also observedthat wherever the infant and child mortality is higher the birth rates are also higher.Women are exposed to a high risk of death due to pregnancy.With greater awareness about the family planning, increasedavailability of the family planning methods and more freedom in its use, the age-specificfertility rates have shown an increasing trend over years in all age-groups. It is seen that Himachal Pradesh is amongst a few states like Kerala, Tamil Nadu, Goa, Delhi, and the smaller northeastern states that consistently perform well in terms of various health indicators.[6] In2012, there were about 56.1 percent live births per 1000 women in the age group 15-49 years (General Fertility Rate) as compared to about 57.3 live births per 1000women in the same age group in 2011.The average number of children that awomen is expected to give birth to (Total Fertility Rate), during the entire childbearing age-group, if she experiences the current fertility pattern throughout, hasbeen decreasing over the years. The total Fertility Rate for 2012 was 1.7.Age specific fertility rate in Himachal Pradesh have shown anincreasing trend over years in all age-groups. In 2012, there were about 145.3percent live births per 100 women in the age group 20-24 years as compared toabout 127.6 live births per 1000 women in the 25-29 age groups[7].

Workforce participation: As per Census, 2011, females constitute 44.82% of the total workforce, main workers (18.43%), marginal workers (26.39%) and non-workers (55.18%). Districts Kinnaur (59.17%), Kullu (56.60%), Chamba (52.47%), Lahaul Spiti (56.97%) Mandi (54.85%)and Hamirpur (51.83%) record high female work participation rates. As per NSS Survey, in terms of workforce, in 2011–12, about 63 percent of rural women in Himachal Pradesh reported themselves as being employed[8]. This places Himachal Pradesh second in female labor force participation in the country, after Sikkim, and significantly above the all-India average of 27 percent. The average of northern Indian state is 25 percent. Much of this is driven by the fact that women in ruralareas in Himachal Pradesh are more than twice as likely as their male counterpartsto report themselves as being self-employed in agriculture. In urban areas, the female labor force participation rate in Himachal Pradesh was much lower, at 28 percent in 2011. In fact, urban women's employment in Himachal

[6] *India Human Development Report, 2011 Towards Social Inclusion*

[7] Women and Men in Himachal Pradesh, Department of Statistics and Economics, Government of Himachal Pradesh

[8] National Sample Survey (NSS, round 68)

Pradesh was at exactly the same level as those in urban areas of Kerala and Tamil Nadu[3]. Data indicates that female employment in state government as of 2013 stands at 21.19%.

Participation in agriculture: Studies[9] indicate that complete access of resources to rural women over use of land was high in Himachal Pradesh (70%), Maharashtra (50%) and Uttarakhand (32%) but low in sale and purchase of land. More women respondents of Himachal Pradesh, Rajasthan and Karnataka had complete access to tools and implements than other states. Complete access to and control over storage and retention for household use for women was higher than other resources in Punjab (63%), Uttarakhand (55%), Andhra Pradesh (51%), Himachal Pradesh (31%), Rajasthan (30%) and Haryana (27%) than rest of the States. Control over improved seeds was visibly high in Uttarakhand (55%). Rural women of Himachal Pradesh (77%) and Rajasthan (50%) were completely responsible for maintenance and lending of tools, which is higher over other states. In Himachal Pradesh, number of women who had control over use of land resources was more than the male members of the family, because men stayed away from the villages for their livelihoods and attended farming operations seasonally. Women had higher responsibilities in backyard management including livestock with highest participation in Punjab, Himachal Pradesh, Rajasthan and Karnataka. Decisions concerning feeding, excreta management, storage of fodder and dairying incomes were made by women. Interstate comparison of participation in extension programmes indicated that women in Assam attended more trainings in horticulture in Himachal Pradesh.

Participation and Representation: The participation of women in development programs and their access to markets, services, and spaces is linked to a culture where female seclusion is not asnormative as it is in neighboring states. NFHS-3 (IIPS 2010) notes that 65 percent of urban women in Himachal Pradesh and 56 percent of rural women participate in household decisions. When combined with a strong tribal ethos where women have greater decision-making roles within the family, it has been easier for Himachal Pradesh to enlist women's participation in programssuch as sanitation, immunization, and other health-related campaigns than it has been for neighboring states.

In terms of political representation, elected women representative in the Panchayati RajInstitutions and urban local bodies have significantly increased due to good numberof women which have actively entered in Politics in Himachal Pradesh. With therepresentation of seats a good number of women have been elected to PanchayatiRaj institutions in Himachal Pradesh for the term 2011-2016. In Himachal Pradeshthere are 3243 Gram Panchayats, out of which 1639(50.54%) seats havebeen occupied by women in 2011 Panchayat elections. Out of total seats occupiedby women, 987 (60.21 per cent) occupied by general women, 421, (25.68 per cent)scheduled caste women, 104 (6.34 per cent) scheduled tribes women and 127 (7.74per cent) occupied by OBC women.Similarly, out to total 77 Chairman Panchayat Samities seats, 42 seats(54, 55 percent) of the seats in this category have been occupied by women. Amongtotal seats occupied by women in Chairman Panchayat Simities category, 20 (48 percent) occupied by general women, 13(31 per cent) by scheduled caste women, 4 (9per cent) by scheduled tribes women and 5 (12 per cent) occupied by OBC women.Out of the total 12 seats chairpersons of Zila Parisad seats, 6 (50 percent) of the seats have been occupied by women in 2011 elections[10].

Government schemes for empowerment of women: The state government has many schemes for the all round development of women right from the time of their birth. Some of the key ones are: *Mukhya Mantri Kanyadan Yojna* (a marriage grant to parents of girls having annual income does not

[9] DARE/ICAR Annual Report 2012–13

[10] Women and Men in Himachal Pradesh, Department of Statistics and Economics, Government of Himachal Pradesh

exceed `20,000); *Pension scheme* (for widow/Destitute/Single Woman Pension); *Widow Re-Marriage Scheme* (for rehabilitation of young widows); Widow Re-Marriage Scheme (for rehabilitation of young widows by increasing them to enter into wedlock)*Matri Seva Yojna* (free institutional deliveries of expectant mothersin all Government hospitals in the State,irrespective of their income); *Self-Employment Scheme for Women* (provision of Rs. 2,500 provided to the women whose annual income is less than 7,500 for carrying income generating activities); *Beti Hai Anmol* (to change negative family and community attitudes towards the girl child at birth and towards her mothers and to improve enrollment andretention of girls (2 girls only) are belonging to the BPL families); *Kishori Shakti Yojna* (to improve the nutritional and health status of girls in the age group of 11-18 years, to provide the required literacy and numeracy skills through non-formal education to train and equip the adolescent girls to improve/ upgrade home-based and vocational skills and to promote awareness ofhealth, hygiene, nutrition and family welfare, home management/ child care and totake all measure as to facilitate their marrying only after attaining the age of 18 yearsand if possible, even later); *Mata Shabri Mahila Sashaktikaran Yojna* (provision of subsidies to BPL families of SC category for purchase of gas connection; and *Self Help Groups* (formation of SHGs to empower poor women through Anganwari workers.

2.2.3 Scheduled Tribes

Article 342 provides for specification of tribes or tribal communities or parts of or groups within tribes or tribal communities which are deemed to be for the purposes of the Constitution the Scheduled Tribes in relation to that State or Union territory. In pursuance of these provisions, the list of Scheduled Castes and / or Scheduled Tribes are notified for each State and Union territory and are valid only within the jurisdiction of that State or Union territory and not outside. Major tribal areas in the state are three major tribal districts - Chamba (comprising of 2 blocks of Pangi and Bharmour), Kinnaur and Lahaul Spiti. There are total of 10 communities as notified in State's Scheduled Tribes list namely, Bhot, Bodh, Gaddi, Gujjar, Jad, Lamba, Khampa, Kanaura (Kinnaura), Lahaula, Pangwala and Swangala.

Population: According to the Census 2011 the population of Himachal Pradesh is 6864602 of which 392126 (5.71%) belongs to Scheduled Tribes. Kinnaur (57.95%) and Lahaul-Spiti (81.44%) have the highest Schedule Tribe populations. The tribal population of H.P. as per 2011 Census can be divided into three categories as under: a) *Scheduled Tribes in Scheduled Areas*, b) *Modified Area Development Approach (MADA*) that cover smaller areas of tribal concentration having 10,000 population in contiguous areas of which 50% or more were tribals; c) *Dispersed Tribes Population:* covering all tribal living outside the Scheduled Area and Modified Area Development Approach pockets. In terms of density of population per square kilometer is the highest in Bharmour (22), Kinnaur (13) and Pangi (12) are followed by Lahaul (3) and Spiti (2). Amongst these five ITDP areas, Kinnaur (1065), Lahaul (1021) and Spiti (1010) have a higher ratio than the state figure (999).In terms of literacy rate, Lahaul (86.97%) has a literacy rate higher than the state literacy rate (82.80). The other four areas have rates ranging from 71.02 (Pangi) and 80 (Kinnaur).

*Landholdings:*A unique aspect of land distribution in Himachal Pradesh is that, unlikeother states, STs in Himachal Pradesh own large chunks of land. In fact, theyrepresent the second largest group among households holding parcels greaterthan 1 hectare. Though areas in Chamba district, such as Bharmour have an average size of operational land holding (0.70 ha). This is indicative of the nature of the tribes that reside inHimachal Pradesh and the fact that they are not among the poorest, as is thecase in many Schedule V areas.

Occupation: Agriculture is the largest industry and main occupation of the people in tribal areas of Himachal Pradesh. The farming in tribal areas is highly agro-pastoral and most of the areas are monocarp areas. Out of total geographical area of 23, 65,533 hect., operational area is only 39,900 hect. i.e. 1.69% owned by 34,500 farmers. The average size of holdings in tribal areas is 1.16 hect.

About 65 percent of the main workers are engaged in agriculture according to the 2001 census. Cultivated area per agriculture workers is 0.44 ha only.

Total cropped area: Highest cropped area is recorded in Kinnaur with more than 9000 hectares of land followed by Bharmour with around 6000 ha of cropped area. Other areas are much lower ranging from 1200 to 2500 hectares.

Area under fruit crops: Area under fruit crops - by Apple and by other fruits are highest in Kinnaur (around 10,000 hectares and around 1,700 hectares), followed by Bharmour (4000 ha and 745 ha). Amongst other areas, Lahaul has 954 ha under Apple, while Pangi has 781 ha under Apple.

For more details, refer to Chapter 7.8 on Tribal Development Framework

2.2.4 Ongoing government schemes and funded projects

There are many centrally sponsored and state level schemes for farmers, tribal and for empowerment of women. In addition, state currently has a few externally aided projects in crop diversification, tourism and watershed sector. While some of the schemes have specific thrust area or focus, there are other centrally sponsored schemes that take an integrated approach to agriculture. Section below presents some of key schemes under horticulture, agriculture, besides some of the recent externally funded projects in the state. *For schemes relating to empowerment of women were already presented in the previous section and schemes relating to tribal, refer to Chapter 7 on Tribal Development Framework.*

Horticulture (state level and central level): These are described below:

- *Horticulture Development Scheme*: Supply of Fruit Plants and elite plant material from registered Govt. and Private nurseries; Supply of horticulture inputs; Establishment of new orchard (Individually or as Garden colony
- *Plant protection services:* Supply of pesticides and plant protection equipment's and release of bio agents in farmers' fields
- *Horticulture Training & Extension Service Services*: Training of Farmers through short term training camps and training courses; Exposure visits of farmers within and outside the state; Organization of seminars and workshops.
- *Development of Beekeeping Services*: Supply of improved strains of bee colonies with hives and Supply of bee colonies for pollination on rental basis.
- *Development of Mushroom Services:* that involves 10 day practical training in mushroom cultivation; registration of trained farmers as mushroom growers; production and Supply of pasteurized mushroom compost from departmental units; availability of quality mushroom spawn and Transportation facility of mushroom composite
- *National level (Mission for Integrated Development of Horticulture).* It includes activities under different aspects of horticultures such as: Plantation Infrastructure Development (Open pollinated crops, Hybrid seeds); Horticulture Mechanization (Tractor, Power tiller, Land Development, tillage and seed bed preparation equipment's; Sowing, planting reaping and digging equipment); Integrated Post-Harvest Management (Integrated pack house with facilities for conveyer belt, sorting, grading units, washing, drying and weighing; Pre-cooling unit; Cold room (staging,); Mobile pre- cooling unit.; Cold Storage (Construction, Expansion and Modernization); Establishment of marketing infrastructure for horticulture produce in government/private and cooperative (Wholesale markets Rural markets/apni mandies/direct markets) Gravity Operated ropeway in hilly areas)

Schemes by department of Agriculture (state and central level): These are described below:

- *Quality Seed Multiplication and Distribution of Fertilizers:*Foundation seeds of Kharif and Rabi crops are produced and certified seeds of various crops are distributed to the farmers in the state; cost subsidy @25% is also being provided on 100% water soluble complex fertilizers to the farmers (limited to Rs. 2500 per farmer) and farmers are educated about balanced use of fertilizers and as per soil testing nutrient basis.
- *Plant Protection:* To control pest situation, pesticides are supplied to the farmers. This is a continued scheme and the provision is made for meeting the expenditure on transportation and subsidy on the cost of plant protection material. The plant protection material including equipments are supplied to the SCs / STs /IRDP families at 50% cost.
- *Commercial Crops:*Under diversification approach, major emphasis is being laid on the production of Off-season vegetables, quality vegetable seeds, Potato and Ginger besides Soybean, Oilseeds and Pulses;
- *Dr. Y. S. Parmar Kisan Sawrozgar Yojna:* Project components include creation of need based infrastructure and are expected to fulfill objectives of high productivity, quality, safeguard against adverse weather, efficient input use etc. Project components include construction of location specific models of poly houses with micro irrigation facility. For this, 85% project assistance shall be provided to the farmers. Also for creation for water sources individually and collectively by a group of farmers (Low/medium lift, pumping machinery), 50% subsidy shall be provided.
- *Rajiv Gandhi Micro-Irrigation Scheme*: to bring 8,500 hectare area will be brought under Drip/ Sprinkler Irrigation System benefitting 14,000 farmers. 80% assistance shall be provided to individual farmer for Micro- irrigation Systems and 50% assistance for construction of shallow wells, shallow bore wells; 50% assistance for lifting water with electric motor
- *CSS - National Mission On Agricultural Extension and Technology (NMAET*): Agricultural Technology, including the adoption/ promotion of critical inputs, and improved agronomic practices were being disseminated under 17 different schemes of the Department of Agriculture & Cooperation during the 11th Plan.
- *CSS - Mass Media Support To Agriculture Extension:* to use television and radio with their massive penetration, as a vehicle for agricultural extension. Basically, the scheme is focusing on two initiatives;
- *CSS-SS -- Rashtriya Krishi Vikas Yojna (RKVY):* The programme focuses on development of major food crops such as wheat, paddy, coarse cereals, minor millets, pulses & oilseeds;. activities related to enhancement of soil health and mechanization; development of rain fed farming systems in and outside watershed areas; Support to state seed farms and IPM; strengthening of market infrastructure and marketing development. VI. Strengthening of infrastructure to promote extension services; Activities relating to enhancement of horticultural production and popularization of micro irrigation systems; Animal husbandry and fisheries development activities; Organic and bio-fertilizers and innovative schemes.

Many of these schemes have varying levels of subsidies of the cost targeted at different social groups.Some of them are cost based such as provision of subsidy up to 15% -33.3%- 50% (up to a limit) for women, SC, ST and tribal in hilly areas; and Credit linked back-ended subsidy @ 50% of cost in case Hilly & Scheduled areas, per beneficiary, etc.

Externally funded projects: These are described below:

i) H.P. Crop Diversification Project (JICA ODA Loan Project): Following a study on diversified agriculture for enhanced farm income in Himachal Pradesh and a Crop Diversification Action Plan for 10 years and Master Plan for 15 years, the objectives of the project comprising 5 districts Kangra, Mandi, Hamirpur, Bilaspur and Una, were to: increase the area and production of vegetables through crop diversification; raise income of small and marginal farmers; create infrastructures for

irrigation, farm access roads, marketing, post-harvestetc.; to promote organic farming in a big way; to organize farmers into groups to take over operation and maintenance of irrigation systems; and provide training and capacity building of Department of Agriculture field extension staff.

ii) Mid-Himalayan Watershed Project: (WB funded): The overall goal of the project is to reverse the process of degradation of the natural resource base and improve the productive potential of natural resources and incomes of the rural households in the project area in Himachal Pradesh (using the Community-driven Development (CDD) approach). A secondary objective is to support policy and institutional development in the state to harmonize watershed development projects and programs across the state in accordance with best practices. It covered 272 Micro-watersheds spread over 602 GPs, 42 blocks and 10 districts and targeted around 25000 target poor families in the project area.

iii) HP State Roads Project: The goal of the project was to upgrade priority segments of the Himachal Pradesh core road network, including widening of formation and pavement strengthening of about 450km of roads, and implementation of ancillary social, environmental and bio-engineering measures. It will also support periodic maintenance and minor rehabilitation of about 2,000km of roads. This will reduce transport costs and to improve traffic flows

iv) India: Infrastructure Development Investment Program for Tourism -HP (financed by Asian Development Bank): As part of the Investment Program, the Project aims to complete subprojects under the following components i) 1- Urban Infrastructure and Service Improvement; 2 - Component 2: Connectivity Improvement, 3 -: Quality Enhancement of Natural and Cultural Attractions; 4 - Community-based Activities; 5 -Capacity Development, Community Participation and Project Management.

2.3 Key findingsand implications for ESMF

Key findings and implications for the ESMF are presented below:

i. 87.03% of the total holdings are of small and marginal farmersand hence are resource poor and may find it difficult to access proposed interventions and therefore it requires the project to incorporate a targeting and inclusion strategy for these beneficiaries;
ii. high literacy levels for men and women (and also in tribal areas) would facilitate communication outreach of project interventions
iii. significant proportion of women participate in agriculture and in particular in Horticulture activities including trainings;
iv. women have a good representation in elected bodies at all levels;
v. Cooperatives/SHGs exist in many of the tribal areas and provide a platform for forming Farming Interest Groups and Farmer Producer Organizations; and
vi. Subsidies available under many government schemes (Centre and State) provide opportunities to explore convergence/dovetailing of project interventions, particularly those that are demand driven.

2.4 Environmental Baseline

Himachal Pradesh is a mountainous state in northern India known for its forests, rivers, and valleys, a rich cultural heritage. The Outer and lesser Himalayan watersheds of the state covering 28,970 sq km area are of great national importance, as entire northern India depends largely for water and power produced by runoff from this region.

Himachal is situated in the western Himalayas. Covering an area of 55,673 kilometers (34,594 miles), Himachal Pradesh is a mountainous state with elevation ranging from about 350 meters (1,148 ft.) to

6,000 meters (19,685 ft.) above the Mean Sea Level. Area-wise, Hamirpur is the smallest district of the Pradesh which covers an area of 1,118 sq. kms (2.01%) and Lahaul & Spiti has the largest area of 13,835 sq. km. (24.85%).

The population of Himachal Pradesh is 68,56,509 as per the Census of India, 2011 . In terms of population it accounts for only 0.57% of total country's population. The population of the State increased by 17.53% between the years 1991–2001 and further increased by 12.81 % in 2011.

The mid Himalayas are fragile ecosystems due to topography and soils as well as because of high intensity rainfall that fall mostly in three months i.e. July, August and September. Long dry spells ranging from 3-4 months before and after the monsoon are also common, which affect the perenniality of the watercourses and bring in, ironically, acute water scarcity as well.

2.4.1 Physiographic Profile

Himachal is in the western Himalayas. Covering an area of 55,673 square kilometres (21,495 sq mi), it is a mountainous state. Most of the state lies on the foothills of the DhauladharRange. At 6,816 m Reo Purgyil is the highest mountain peak in the state of Himachal Pradesh.

The drainage system of Himachal is composed both of rivers and glaciers. Himalayan rivers criss-cross the entire mountain chain. Himachal Pradesh provides water to both the Indus and Ganges basins. The drainage systems of the region are the Chandra Bhaga or the Chenab, the Ravi, the Beas, the Sutlej, and the Yamuna. These rivers are perennial and are fed by snow and rainfall. They are protected by an extensive cover of natural vegetation.

Due to extreme variation in elevation, great variation occurs in the climatic conditions of Himachal. The climate varies from hot and sub humid tropical in the southern tracts to, with more elevation, cold, alpine, and glacial in the northern and eastern mountain ranges. The state has areas like Dharamsala that receive very heavy rainfall, as well as those like Lahaul and Spiti that are cold and almost rainless. Broadly, Himachal experiences three seasons: summer, winter, and rainy season. Summer lasts from mid-April till the end of June and most parts become very hot (except in the alpine zone which experiences a mild summer) with the average temperature ranging from 28 to 32 °C (82 to 90 °F). Winter lasts from late November till mid March. Snowfall is common in alpine tracts (generally above 2,200 metres (7,218 ft) i.e. in the higher and trans-Himalayan region).

Himachal Pradesh is divided into 12 districts namely, Kangra, Hamirpur, Mandi, Bilaspur,Una, Chamba, lahaul and Spiti, Sirmaur, Kinnaur, Kullu, Solan and Shimla. The state capital is Shimla, which was formerly British India's summer capital under the name Simla. The State is bordered by Jammu and Kashmir on the north, Punjab on the west, Haryana on the south-west, Uttarakhand on the south-east and by the Tibet Autonomous Region on the east.

A district of Himachal Pradesh is an

Figure 3 Map of Himachal Pradesh

administrative geographical unit, headed by a Deputy Commissioner or District Magistrate, an officer belonging to the Indian Administrative Service. The district magistrate or the deputy commissioner is assisted by a number of officers belonging to Himachal Administrative Service and other Himachal state services. Each district is subdivided into Sub-Divisions, governed by a sub-divisional magistrate, and again into Blocks. Blocks consist of panchayats (village councils) and town municipalities. A Superintendent of Police, an officer belonging to the Indian Police Service is entrusted with the responsibility of maintaining law and order and related issues of the district. He is assisted by the officers of the Himachal Police Service and other Himachal Police officials.

The state can be divided into three main topographical regions (i) the Shiwaliks (ii) the lesser Himalayas and (iii) the greater Himalayas. About 90 per cent of the population resides in rural areas. Himachal Pradesh is largely mountainous with the exception of small pockets bordering Punjab and Haryana. The state comprises hilly terrain, perennial rivers, and significant forest cover. The state offers many opportunities, given its abundant water resources, hydropower, mineral resources, horticulture, agriculture, and potential for tourism. It is however, facing significant challenges arising from its elevation, topography, and ecological vulnerability. Agriculture contributes over 45% to the net state domestic product. It is the main source of income and employment in Himachal. Over 93% of the population in Himachal depends directly upon agriculture which provides direct employment to 71% of its people.

2.4.2 Topography

Topographically, the state can be divided into three zones:

1. The Shiwaliks or Outer Himalayas: It covers the lower hills of Kangra, Hamirpur, Una, Bilaspur, lower parts of Mandi, Solan and Sirmour districts. Within this zone, altitude varies from 350 m to 1500 m.
2. Inner Himalayas or mid-mountains: Altitude varies from 1500 m to 4500 m above mean sea level and includes areas such as the upper parts of Pachhad and Renuka in Sirmaur district, Chachiot and Karsog tehsils of Mandi district and upper parts of Churah tehsil of Chamba district.
3. Alpine zone or the greater Himalayas: Has altitude above 4500 m above mean sea level and comprises areas of Kinnaur district, Pangi tehsil of Chamba district and area of Lahaul & Spiti district.

2.4.3 Climate of HP

The term climate is mainly determined by two variables viz. temperature and precipitation. The climate of the state varies from place to place depending on the altitude. It varies from hot and subhumid tropical (450-900 m) in the southern low tracts, warm and temperate (900-1,800 m), cool and temperate (1,900-2,400 m) and cold alpine and glacial (2,400-4,800 m) in the northern and eastern high mountain ranges.

There is a great variation in the climatic conditions of Himachal Pradesh due to extreme variations in elevation(450–6500 metres). The climate varies from hot and sub-humid tropical (450–900 metres) in the southern low tracts, warm and temperate (900–1800 metres), cool and temperate (1900–2400 metres) and cold glacial and alpine (2400–4800 meters) in the northern and eastern high elevated mountain ranges. Broadly the state experiences three marked seasons; hot weather season, cold weather season and rainy season. Evaporation generally exceeds rainfall over a period of six months during October to December and April to mid-June. Summer lasts from mid-April till the end of June and most parts become very hot (except in alpine zone which experience mild summer) with average temperature ranging from 28°C (82 °F) to 32°C (90 °F). July to September is marked by rainy season when monsoon is vigorous in the state. Winter lasts from late November till mid-March when temperature plummets subzero. The average rainfall in Himachal Pradesh is 1,111 mm, varying from 450mm in Lahaul and Spiti to over 3,400mm in Dharamshala, the headquarters of Kangra District. Precipitation declines from west to the east, and south to the north. Winter precipitation occurs as snow at elevations above 1800m. An average of three meters of snow is experienced between December and March. The details of the climatic parameters are provided in the following sections.

Figure 4 Climatic Classification of HP

2.4.3.1 Temperature in Different zones of HP

There is great variation in the climatic conditions of Himachal due to extreme variation in elevation. The climate varies from hot and sub-humid tropical in the southern tracts to cold, alpine and glacial in the northern and eastern mountain ranges with more elevation. The state has areas like Dharamsala that receive very heavy rainfall, as well as those like Lahaul and Spiti that are cold and almost rainless. Broadly Himachal experience three seasons; hot weather season, cold weather season and rainy season. Summer lasts from mid-April till the end of June and most parts become very hot (except in alpine zone which experience mild summer) with the average temperature ranging from 28 °C (82 °F) to 32 °C (90 °F). Winter lasts from late November till mid-March. Snowfall is common in alpine tracts (generally above 2,200 meters (7,218 ft.) i.e. in the Higher and Trans-Himalayan region.

Table 4 Temperature at selected Stations in 2013

Maximum Temperature (in Celsius)													
Sl. No	**Centres**	**Months**											
		January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**Sept**	**Oct**	**Nov**	**December**
1	**Saloni**	14.10	14.10	24.60	26.30	31.30	31.00	29.70	27.60	28.00	25.40	21.40	17.70
2	**Dharamshala**	16.80	17.70	22.40	25.00	31.60	28.80	27.60	26.80	27.40	25.70	21.30	16.50
3	**Kalpa**	3.60	1.90	9.70	16.60	21.70	22.30	23.60	22.50	21.30	19.20	14.00	10.20
4	**Bhuntar**	16.60	16.70	24.40	26.90	33.10	31.90	31.50	31.00	32.00	29.10	23.60	19.30
5	**Keylong**	2.00	4.90	8.10	13.30	21.00	25.90	28.10	26.20	22.20	15.50	9.30	6.10
6	**Sundernagar**	18.90	19.10	26.10	29.50	35.60	31.70	31.50	30.60	31.30	29.10	25.00	20.40
7	**Shimla**	12.20	12.50	19.00	21.40	26.40	24.40	23.50	22.70	23.10	20.90	18.40	15.50
8	**Nahan**	16.30	18.50	24.80	29.60	34.40	28.80	27.40	26.90	28.20	26.00	21.90	18.00
9	**Solan**	117.70	18.00	24.20	26.90	32.20	28.80	28.30	28.30	28.00	26.20	23.50	19.90
10	**Una**	18.90	22.10	30.20	34.60	40.40	36.10	34.00	33.10	33.90	30.90	26.40	22.00
11	**Manali**	8.80	9.10	17.60	20.70	25.90	25.50	25.00	23.40	23.50	21.10	15.80	15.20
Minimum Temperature- (in Celsius)													
		January	February	March	April	May	June	July	August	Sept	Oct	Nov	December
1	**Saloni**	2.00	2.40	7.10	9.40	13.70	14.90	17.30	16.70	14.30	11.90	6.10	3.20
2	**Dharamshala**	6.00	7.20	11.70	14.10	20.00	21.20	21.40	20.60	19.90	18.00	10.00	6.80
3	**Kalpa**	-5.30	-4.80	0.70	3.50	8.30	12.00	14.60	13.90	9.60	6.40	0.90	-1.70
4	**Bhuntar**	0.80	4.30	7.30	10.00	12.90	19.00	20.90	20.40	16.70	13.40	4.30	1.20
5	**Keylong**	-9.90	-7.30	-4.40	1.00	6.10	11.30	14.00	14.30	9.00	6.00	-3.00	-5.70
6	**Sundernagar**	1.80	5.90	9.10	12.10	16.50	20.70	22.00	21.90	18.30	14.70	5.30	1.70
7	**Shimla**	2.80	3.80	9.10	11.70	17.10	16.50	17.20	16.60	14.70	12.20	7.60	4.80
8	**Nahan**	4.90	7.20	11.40	16.50	21.70	18.40	18.50	18.20	17.10	14.60	12.10	5.80
9	**Solan**	1.10	4.60	8.30	11.50	15.50	18.50	19.70	19.50	15.70	12.40	4.70	2.00
10	**Una**	4.00	7.90	11.40	14.80	19.70	24.20	24.20	23.50	21.30	17.00	7.80	3.90
11	**Manali**	-2.10	-0.60	3.40	5.50	9.30	13.80	15.60	15.40	12.10	8.50	1.60	-0.90

Source: Statistical Year Book of Himachal Pradesh 2013-2014, Department Of Economics & Statistics Himachal Pradesh, Shimla

Temperature variation of HP

The spatial distribution of the mean daily maximum temperature for the representative months of four seasons of a year is depicted in the table below. It is observed that the temperatures of hilly districts with deep valleys vary considerably from place to place depending on elevation. June is the hottest month with the mean daily maximum temperature of 35.50C in the plains and 28.70C in hilly

places. During June, the mean daily maximum temperature ranges from 240C to 38.40C over the state, the values increases towards southwest. The highest values are observed over the extreme south western region. With the onset of monsoon season the day temperatures falls significantly. During August, an appreciable drop in the mean daily maximum temperature is observed with the values ranging between 20.40C and 32.60C. The values of mean daily maximum temperature in October range between 18.80C to 30.60C with the values generally increasing towards southwest. It is observed that the mean daily maximum temperature of January ranges between 9.30C and 20.30C. The temperature pattern of January is quite similar to that of October.

Table 5 Seasonal variation on Min and Max temperature of the state

Season	Statistics	Max. Temperature (⁰C)	Min. Temperature (⁰C)
Annual	Average	22.31	10.6
	Range-average	17.3-29.7	6.2-16.2
Winter	Average	14.6	3.1
	Range-average	9.3-22.6	-1.7-8.9
Pre-monsoon	Average	23.9	10.91
	Range-average	14.6-36.2	2.6-20.8
Monsoon	Average	27.02	17.01
	Range-average	20.3-38.4	11.1-24.5
Post Monsoon	Average	22.05	8.58
	Range-average	15.1-30.6	1.4-17.5
Annual	Range-Inter-annual variation	0.04-0.06	0.02-0.03
Winter	Range-Inter-annual variation	0.07-0.09	0.16-0.18
Pre-monsoon	Range-Inter-annual variation	0.02-0.03	0.04-0.04
Monsoon	Range-Inter-annual variation	0.01-0.03	0.03-0.05
Post Monsoon	Range-Inter-annual variation	0.06-0.08	0.04-0.06

Source : IMD Rainfall data, 1995-2005,

2.4.3.2 Rainfall in Different districts of HP

The maximum rainfall was recorded in the kangra district with around 2000 mm and minimum in the Lahaul and Spiti district with around 500 mm. the average rainfall across the state is around 1100-1250 mm.

Table 6 District - Wise Rainfall (in mm)

Sl. No	District	2010	2011	2012	2013
1	Bilaspur	1079.7	1128.2	1034.7	1167.4
2	Chamba	1117.5	1056.8	1350.7	1167.4
3	Hamirpur	1247.1	1417.6	1456.8	1428
4	Kangra	1619.6	1877.4	2311.1	2398
5	Kinnaur	1107.8	573.5	477.1	1055

6	Kullu	1732.5	1292.8	1351.1	1286.4
7	Lahaul- Spiti	847.1	471.2	492.9	507.9
8	Mandi	1495.4	1470.5	1462.9	1616
9	Shimla	1272.3	912.1	1057.4	1236.9
10	Sirmaur	1896.9	1600.1	1102.3	1807.6
11	Solan	1377.3	911.1	1057.4	1236.9
12	Una	1182.3	1271	1086.8	1455.1
	H.P.	**1331.3**	**1165.2**	**1170**	**1358.3**

2.4.3.3 Effect of Climate Change on Horticulture in Himachal Pradesh

Erratic and changing weather pattern has affected on the sustainability of marginal agriculture and horticulture in the State where average holding size is 1.04 ha and about 70% of the population depends upon these two sectors for their livelihood. Over 92% of the holdings in the State are classified as small or marginal and dependence on rain in some areas is very high. Thus, when viewed along with other specificities such as infrastructure, rugged topography, limited land for cultivation, limited livelihood choices, low productivity of land, and vulnerability to natural disaster renders the state to be highly vulnerable to the phenomena of climate change.[11]

- Rabi crops more affected due to erratic rainfall.
- Diversion from apple to vegetables especially in the Lower Kullu valley.
- Increase in annual production of vegetables from 25,000 tonne in 3,000 ha area in 1951-52 to 1,269 thousands tonne in 65,000 ha area in 2010-11.
- The rise in temp has affected the apple production especially located on the lower altitude.
- Apple production in cold desert areas has suddenly improved.
- Change in average winter temperature has led to early flowering in Rhododendron.

2.4.3.4 Indicators of Climate Change in Himachal Pradesh

- Rise in temperature in the NW Himalayan Region by about 1.6°C in the last century.
- Warming rate of Shimla was higher during the period 1991-2002 as compared to earlier decades.
- About 17% decrease in rainfall in Shimla was observed from 1996 onwards.
- The decreasing trend in seasonal snowfall in Shimla is very conspicuous since 1990 and it was lowest in 2009.
- Monsoon discharge in Beas River has shown a significant decrease.
- Winter discharge in River Chenab has shown a significant increase.
- Satluj showing an increasing trend in winter and spring discharge.
- Quality of apple has been affected and the apple line has shifted upwards.
- Area under apple is being diverted to vegetable due to rising temperature.
- Incidence of pest and disease are more severe.

[11] State Strategy & Action Plan On Climate Change Himachal Pradesh - 2012

- Pine forest invading heights.
- Kikar, Tali (Shisham), Deodar, Ban trees are on decline. Water fowls, Ducks, Birds, House sparrows, Vultures

Table 7 Characteristics of the agro climatic zones of HP

Particulars and Characteristics	Shivalik Zone	Mid-Hill Zone	High hill zone	Trance-Himalayan Zone
Altitude	Up to 800 m	800m-1,600m	1,600m-2,700m	2,700m-3,600m
Type of area	Valley areas and foothills	Hilly and mountain ranges	Alpine zone	Lahaul Spiti and Kinnaur range
Climatic conditions	Sub tropical	Slightly warm temperature	Cool temperature with humidity	Dry and extremely cold conditions
Districts	Una, Bilaspur, Hamirpur districts and parts of Sirmaur, Kangra, Solan and Chamba districts.	Palampur and Kangra Tehsil of Kangra district, Rampur Tehsil of Shimla district and parts of Mandi, Solan, Kullu, Chamba, Bilaspur and Sirmaur district.	North – western Himalayan region lying in the state	Kinnaur, Lahaul and Spiti and part of Chamba district.
Rainfall in mm.	1,500	1,500-3000	1,000-1,500	500
% of total geographical area	30%	10%	25%	35%
% of total cultivated area	55%	30%	10%	5%
Soil types	Hill soils, mountain, meadow skeletal, tarai	Brown hills	Submountain, mountain skeletal, meadow	Alluvial (Recent), brown hills.
Major Crops	Rice, Wheat, Sugarcane, Citrus, Mango, Litchi, Guava, deciduous forest, dry deciduous shrubs, Vegetables, oilseeds, Barley.	Rice, Wheat, Arhar, Sesamum, Temperate fruits, Citrus, Vegetables, lower west Himalayan temperate forest and Himalayan chirpine forest.	Maize, Rice, Oilseeds, Pulses, Rajmash, Soybean, Barley, Bee keeping, Apple, Pear, Plum, Peach, Apricot, chestnut, Vegetables.	Barley, Maize, Pulses, Potatoes, Minor millets, Kutheris, Hopes, Kumin, saffron, Apples, Nuts, Dry fruits, Chilgoza, Neoza pine, Yak, Jersey cow, Cabbage seed, Sugerbeet, Chicory, Agro-forestry Alnus, Ulnas, Cettis, Salix.

Source: HP Forest Dept, 2013

2.4.4 Geography

The state is bound by Uttar Pradesh on the southeast, Tibet on the east, Punjab on the west and southwest, Haryana on south and Jammu & Kashmir on the north. It is situated in the northwest corner of India, right in the lap of Himalayan ranges.

Himachal Pradesh displays prominent features characterized by lofty mountain ranges incised by deeply dissected valleys carved out in slopes of various descriptions. The elevation above mean sea level varies from 320m in Una District, to 6975 m at Leo Pargil Peak of Kinnaur District. Physiographically, the State can be divided into five distinct parallel zones. From south to north these are:

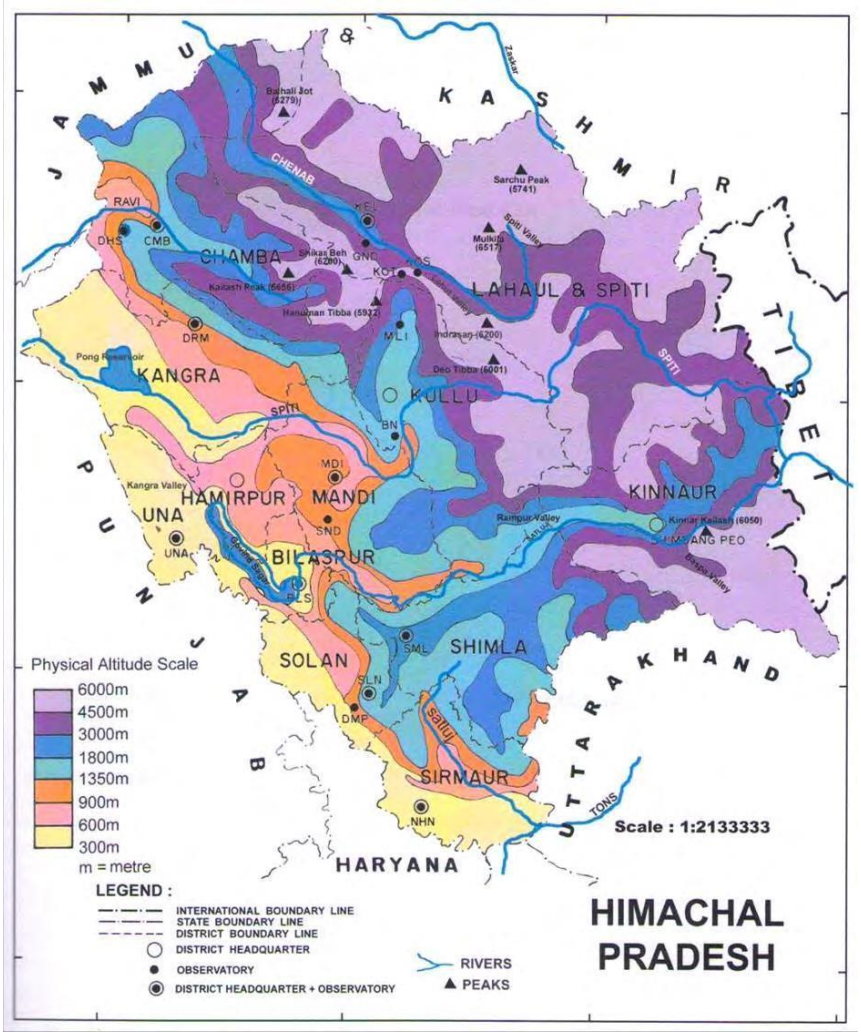

Figure 5 Elevation Map of HP

1. Alluvial Plain: A limited zone of nearly flat plain developed at the foot hills of Siwalik Range in the vicinity of Indo-Gangetic Alluvium in the south western and southeastern fringes of the state with an average altitude of 375m.
2. Siwalik Foothills: It is also known as Sub Himalaya and is the outermost mountainous zone of Himachal Himalaya, separating the state from the plains of Punjab and Haryana. It is 8 km -

50 km wide zone, with altitude ranging from 345m to 1500m. This zone contains many prominent longitudinal valleys viz. Una, Sirsa and Poanta duns.

3. Lesser Himalayan Zone: It is a 65km to 80km wide zone between Sub-Himalaya and Central Himalaya. The altitude of this zone rarely exceeds 3000m.
4. Central Himalayan/Great Himalayan Zone: It comprises a zone of snow-capped peaks ranging in height from 4000m to 5000m. It separates the Lesser Himalayan zone from the Trans-Himalayan zone.
5. Trans Himalayan/Higher Himalayan Zone: It is mainly a rain shadow area, having an average width of 40km and height varying from 3000m to 6000m. The mountain ranges in general trend in NW-SE direction.

2.4.5 Geology

The state of Himachal Pradesh is covered by the rocks ranging in age from Precambrian to Recent. The normal order of super-position of the rocks in the Lesser Himalaya has been affected by later events of thrusting. Owing to its complex tectonism and geological evolution, establishing an unanimously accepted geology and stratigraphy of Himalaya remained mired with debate and controversy- posing a natural deterrent. With this backdrop, effort is made hereunder to present a generalised view.

2.4.6 Water Resources of HP

There is a network of perennial rivers in Himachal Pradesh, which have glaciers as their sources. Majority of the drainage of the State belongs to Indus River System.

Table 8 Water sources of HP

District	Ground Water	Surface Water	Rain Water	Traditional Source	Other Conventional Sources
Bilaspur	827	786	0	461	0
Chamba	1717	2433	3	2598	836
Hamirpur	1057	485	0	231	1
Kangra	1602	1317	11	1369	466
Kullu	0	3392	0	0	0
Lahul & Spiti	1	290	0	57	0
Mandi	833	3924	0	1483	840
Shimla	233	3917	5	2518	9
Sirmour	644	2249	0	535	9
Solan	344	1090	0	1215	316

Una	832	123	1	21	116
Total	8186	20223	20	10512	2595

Source: SoER, Himachal Pradesh

2.4.6.1 Rivers

The state is drained by nine river systems. The Satluj, Beas, Ravi, Chenab, Spiti, Parbati, Pabbar, Tons and Giri are the main rivers of Himachal Pradesh. Of these, the Satluj, which rises in the highlands of Tibet, is an antecedent river. The largest river system in the state with a total catchment area of 20,398 km^2, spread over the districts of Lahaul and Spiti, Kinnaur, Shimla, Solan, and Bilaspur before entering Punjab, it enters the large Bhakra dam.

Nearly 17% of the total area of Himachal Pradesh is covered by glaciers. A recent study in 2004 has documented 2,554 glaciers in the state, which are the source of fresh water to the rivers of North India. Bara Shigri is the largest glacier in the State, which is located in the Chandra valley of Lahaul and feeds the Chenab River. The glacier is more than 25km long and about 3km wide. Chandra Nahan, Bhadal, Bhaga, the Lady of Keylong, Mukkila and Hamata are other major glaciers in the state. There are many fresh water lakes in Himachal Pradesh.The Chandra Tal, Suraj Tal, Yonam Tso and Nako Lake are the lakes formed due to damming of glaciers, while the Riwalsar and Renuka lakes are due to damming of river/stream courses. Besides, Gobindsagar, Pong and Pandoh are the artificial lakes in the state formed due to the construction of dams across Satluj and Beas rivers.

2.4.6.2 Catchment areas of the River System

The states is drained by nine river systems, the catchment area is given in the table below

Table 9 Catchment details of river system of HP

Sr. no	Name of the river system	Catchment Area (km)	Percentage (%)
1	Satluj	20,398	30.69
2	Beas	13,663	24.50
3	Chenab	7850	14.2
4	Yamuna	5872	10.6
5	Ravi	5528	9.9
6	Indus	1450	2.6
7	Markanda	360	0.6
8	Ganga	290	0.5
9	Pabbar	262	0.5
	Total	**55673**	**100**

2.4.6.3 Lakes

There are a number of small and large lakes in Himachal Pradesh. Most important representing the water budget for the state are 21. These are in Kullu (Bhrigu, Dashair, Seruvalsar, and Mantalai), Mandi (Rewalsar, Prashar), Kangra (Dal, Kareri, and Pong Dam), Nako in Kinnaur, Surajtal and Chandertal in Lahul-Spiti, Chamba(Khajiar, Mani Mahesh, Gadhasaru, Gauri Kund, Lam Dal Lake, Mahakali, and Khundi Maral), Renuka in Sirmaur and Chandernaun in Shimla.

Water storage in Himachal Pradesh is estimated at around 14,000 million m^3. The two major storages located on the borders of the state are The Gobindsagar Reservoir (Bhakra Dam) in the Satluj with 6,900 million m^3 live storage, the Pong Dam located on the border with Punjab in the Beas River with 7,300 million m^3 live storage and The Pandoh Dam, a hydroelectric dam on the river Beas upstream of Mandi, has live storage of 18 million m^3.

2.4.7 Groundwater Resources

The groundwater resources occur mainly in unconsolidated sediments of inter montane valleys and in the sub montane tract. Kangra, Una, Hamirpur, Bilaspur, Mandi, Solan and Sirmaur districts, particularly their valley areas depend upon groundwater. The exploitation is done through open wells, tube wells, infiltration galleries and wells. There is no district notified as critically exploited or over exploited out of 12 districts of Himachal Pradesh.

Table 10 The status of development of groundwater resources in the state

S no	Components	Resources
1.	Total replenishable groundwater resources	0.036 m
2.	Provision for domestic, industrial and other uses	0.007 m ham/yr
3.	Available net groundwater resources for irrigation	0.029 m ham/yr
4.	Net draft	0.005 m ham/yr
5.	Balance groundwater resources for future use	0.024 m ham/yr
6.	Level of groundwater development	18.18 %
7.	Utilisable irrigation potential by groundwater development	65,500 ha

Source: Central Ground Water Board, State profile

2.4.8 Notified Ramsar Wetlands in Himachal Pradesh

Pong Dam Lake

Pong Dam is situated at district Kangra and the bank of Beas river along boundary of Himachal and Punjab states. It is situated at 310 58’57”N and 760 03’33”E 430m above msl in Kangra District with an area of 21712 hectare. It is a water storage reservoir. At high water level maximum depth exceeds 59 m and low water level a muddy shore line upto 100 m. The reservoir contains several large islands.

Chandra Taal

Chandra Tal is situated at an altitude of about 4,300 metres (14,100 ft) in the Himalayas. The name of the lake originates from its crescent shape. Situated in the Spiti part of the Lahul and Spiti district of Himachal Pradesh, Chandra Taal is a popular destination for trekkers and campers. The lake is

situated on the Samundra Tapu plateau, which overlooks the Chandra River. The lake is one of two high-altitude wetlands of India which have been designated as Ramsar sites.

Renuka Wetland

It is located in Sirmaur District at an altitude of 660 m above msl. There has been great concern about the ecological deterioration, habitat degradation and eutrophication of wetland due to silting, high level of organic pollution, dumping of non biodegradable materials by pilgrims and tourists. This has not only resulted in habitat deterioration, shrinking of the aquatic life, but also the terrestrial fauna of Renuka Sanctuary as this is the only perennial source of water for wild animals.

2.4.9 Land use

The land use of the state maintain a two third i.e, 66% of the land in forest landuse.

Table 11 District wise land utilization pattern of Himachal Pradesh for the year 2003-04 (%)

S No	Land category	Bilaspur	Chamba	Hamirpur	Kangra	Kullu	Kinnaur	L&S	Mandi	Shimla	Sirmour	Solan	Una
1	Forest	11.89	39.29	16.69	40.08	-	6.03	14.9	44.08	25.32	11.21	21.5	11.7
2	Barren	4.38	0.79	12.98	2.98	2.20	20.98	14.9	6.28	2.34	7.84	3.78	14.9
3	Non agricultural uses	12.87	1.69	16.33	13.39	12.2	19.97	45.6		2.95	5.97	4.76	18.8
4	Culturable waste	5.54	0.90	10.52	4.65	5.59	0.58	0.07	1.13	2.44	7.95	6.98	15.2
5	Permanent pasture	36.37	50.93	4.35	15.21	-	50.93	24.2	24.23	49.03	41.69	25.3	8.59
6	Misc. tree crop	0.18	-	0.02	1.59	0.80	0.01	0.01	0.08	1.34	0.88	16.5	4.33
7	Current fallow	0.98	0.32	5.26	1.78	6.78	0.29	0.04	2.61	2.14	2.21	1.91	1.10
8	Other fallow	1.07	0.03	1.91	0.14	-	0.01	-	0.05	1.12	0.77	1.11	1.48
9	Net area sown	26.72	6.05	31.94	20.18	72.4	1.20	0.33	21.54	13.32	21.48	18.1	23.8
	Total geographical area ('000' ha)	111.8	692.4	110.2	578.0	150.1	623.7	911	397.8	508.3	180.9	224	155

Source: Various issues of annual season and crop reports.

(http://shodhganga.inflibnet.ac.in/bitstream/10603/10549/9/09_chapter-iv.pdf)

2.4.10 Forest Resources

Forests in Himachal Pradesh have a most productive ecological niche. As per latitude, the state falls in the tropical zone, but its geographical location and good forest cover have enriched it, both biologically and economically.

Forests are the storehouse of the rich biodiversity. They constitute the essential life support system besides being a source of timber, fuel, fodder and medicines etc. They ought to be recognized as water reservoirs, natural source of soil nutrition, soil creators and soil binders. In Himachal unlimited scope exists for intensification and diversification of forest cover.

Table 12 Forest Cover from 1972 to 2002 in Himachal Pradesh (Area in km2)

District	Geographical Area	Total Forest Area	%age of the total area	Reserved Forests	Protected Forests	Unclassified forest
Bilaspur	1,167	428	36.68	0.90	427.41	-
Chamba	6,522	5030	77.12	372.53	4645.39	-
Hamirpur	1,118	219	19.59	-	156.42	27.13
Kangra	5,739	2842	49.52	76.01	2193.84	504.54
Kinnaur	6,401	5093	79.57	-	5092.61	-
Kullu	5,503	4952	89.99	160.52	4791.17	-
Lahul & Spiti	13,841	10133	73.21	70.54	10062.37	-
Mandi	3,950	1860	47.09	1,575.57	284.45	-
Shimla	5,131	3418	66.61	53.46	3310.38	-
Sirmour	2,825	1843	65.24	1,064.70	56.66	685
Solan	1,936	728	37.60	53.55	502.05	165.77
Una	1,540	487	31.62	43.92	178.08	265
Total	55,673	37,033	66.52	1,896.13	33029.67	2100

The total area of Himachal Pradesh is 55,673 sq. km, out of this 66.52% of the area of the state is legally defined as forestland. This already underscores the importance of forest in the lives of people in Himachal Pradesh.

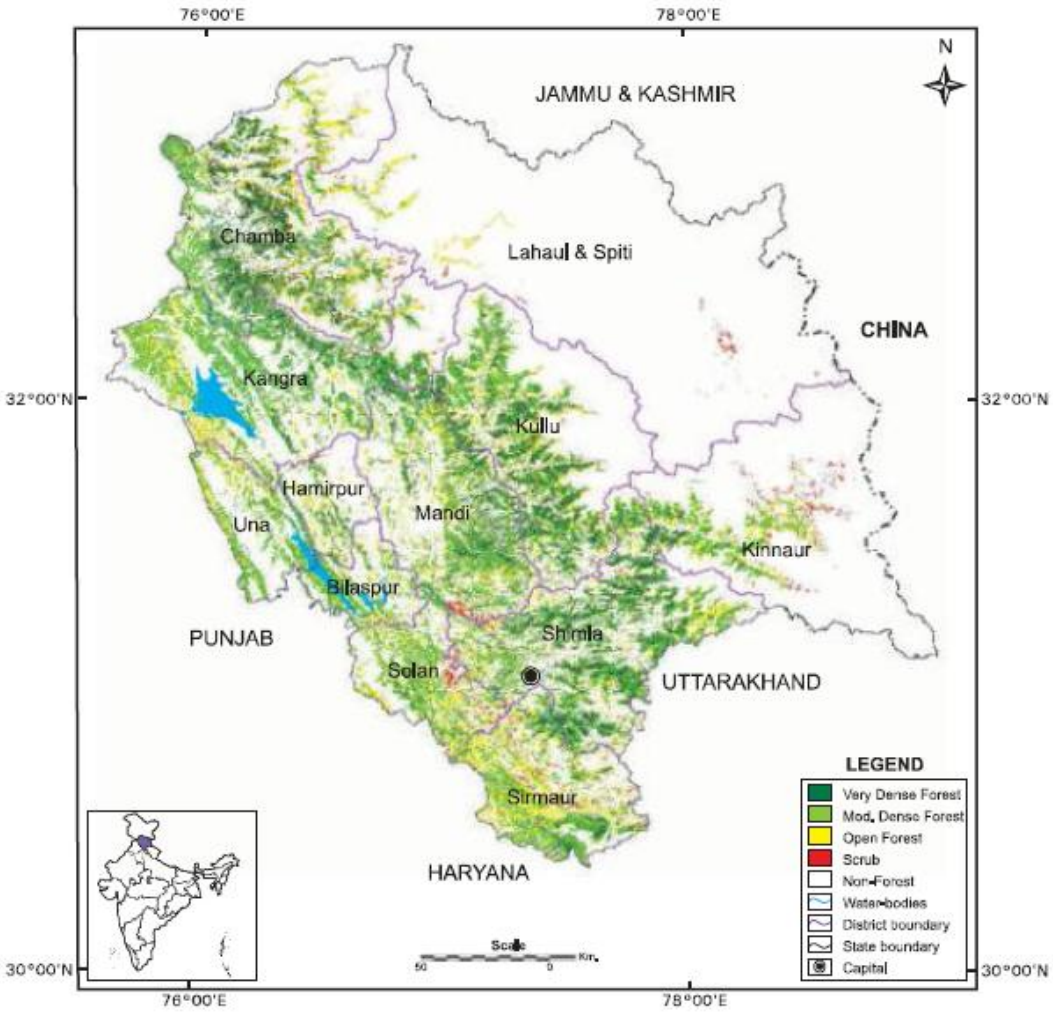

Figure 6 Forest Cover Type of HP

2.4.11 Flora and Fauna

Himachal is said to be the fruit bowl of the country, with orchards being widespread. Meadows and pastures are also seen clinging to steep slopes.

The southern part of the state, at lower elevations than the north, has both tropical and subtropical dry broadleaf forests and tropical and subtropical moist broadleaf forests. These are represented by north western thorn scrub forests along the border with Haryana and Uttar Pradesh and by Upper Gangetic Plains moist deciduous forests in the far southeast. Sal and shisham are found here.

The hills contain western Himalayan broadleaf forests and Himalayan subtropical pine forests. Various deciduous and evergreen oaks live in the broadleaf forests, while chir pine dominates the pine forests. Western Himalayan subalpine conifer forests grow near treeline, with species that include East Himalayan fir, West Himalayan spruce, deodar (the state tree), and blue pine.

The uppermost elevations have western Himalayan alpine shrub and meadows in the northeast and north western Himalayan alpine shrub and meadows in the northwest. Trees are sturdy with a vast network of roots. Alders, birches, rhododendrons and moist alpine shrubs are there as the regional vegetation. The rhododendrons can be seen along the hillsides around Shimla from March to May. The shrub lands and meadows give way to rock and ice around the highest peaks.

Himachal Pradesh has around 463 bird and 359 animal species, including the leopard, snow leopard (the state animal), ghoral, musk deer and western tragopan. It has 2 major national parks and sanctuaries — the largest number in the Himalayan region. The Great Himalayan National Park in Kullu district was created to conserve the flora and fauna of the main Himalayan range, while the Pin Valley National Park to conserve the flora and fauna of the cold desert.

Table 13 Type of flora

Type of flora	Numbers
Flowering Plants	3,120 species
Conifers	13 species
Pteriophytes	124 species
Orchids	38 species

Table 14 Flora in different zones (Altitude) of HP

Classification based on latitudinal Zones		Flora of Himachal Pradesh
1. Lower Motane Zone (up to 1,000metres above m. s. l)	A. Trees B. Shrubs C. Grasses	Khair, Siris, Kachnar, Semal, Tun, Mango, Behul, Shisham, Ritha, Tut, Behera & Chil. Vitex, Munj, Ber, Ipomea, Dodonea, Bamboo. Vetiver, Sanchrus, Munjh.
2. Middle Motane Zone (From 1,000metres to 2,000metres above m. s. l.)	A. Trees B. Shrubs C. Grasses	Kunish, Poplar, Willow, Ohi, robinia, Drek, Kail, Chil Toon, Behmi, Chulli, walnut, Khirik. Vitex, Berberis, Carrisa. Lolium, Dactylis, Phleum, Phylaris.
3. Temperate Zone (From 2,000metres to 3,000metres above m. s. l.)	A. Trees B. Shrubs C. Grasses	Deodar, Fir Spruce, Maple, Ash, BhojPatra, Horse Chestnut, Alder, Robinia, poplar, Walnut. Berberis. Festuca, Dactylis, Bromus, Lucerne, white Clover, Red Clover, dioscorea.
4. Alpine Zone (Above 3,000metres above m. s. l.)	A. Trees B. Shrubs C. Grasses	Birch, Juniper, Cypress, Willow. Saussurea lappa, Cotoneaster microphylla, Artemesia. Festuca arundinacea, Dectylis glomerata.

2.4.12 Ecologically Protected Area in the state

With a view to conserve the total range of wildlife available in the state, the Government of Himachal Pradesh has declared several areas, covering all the agro-climatic zones in the state and having significant ecological, geomorphologic and biodiversity value, as Conservation Reserves, Wildlife Sanctuaries and National Parks.

Table 15 List Of Protected Areas In Himachal Pradesh

Sl. No.	Protected Areas	Area (sqkm)	District (s)	Fauna
1	Great HimalayanNational Park	755.00	Kullu	Blue sheep, snow leopard, Himalayan brown bear, Himalayan tahr, and Musk deer
2	Pin ValleyNational Park	675.00	Lahul &Spiti	Red Indian Fox, Tibetan Gazelle, Wooley Hare, Snow Leopard, Himalayan Marmot, Himalayan Mouse-hare, Indian Hodgsoris Porcupine, Blue Sheep and Wolf
	Wildlife Sanctuaries			
1	Bandli WLS	41.00	Mandi	Himalayan Black Bear, common Palm Civet, Barking Deer, Goral, Indian hare, Rhesus Macaque.
2	Chail WLS	109.00	Solan	Sambar, Goral, Himalayan Black Bear, Red Deer, Silver-White Oak, Barking Deer, Common Langur, Leopard, Rhesus Macaque, Himalayan Yellow Throated Marten, Indian Porcupine, Giant and Kashmiri Flying Squirrel.
3	Chandratal WLS	38.56	Lahul &Spiti	Ibex and Snow leopard
4	Churdhar WLS	66.00	Sirmaur	Himalayan Black Bear, Barking Deer, Musk Deer, Common Langur and Leopards
5	Daranghati WLS	167.00	Shimla	Himalayan Black Bear, Brown Bear, Himalayan Palm Civet, Barking Deer, Musk Deer, Flying Fox, Goral, Indian Hare, Stripped Hyena, Himalayan Ibex, Leopard, Himalayan yellow throated Marten, Serow, Blue Sheep, Common giant flying Squirrel and Himalayan Weasel
6	Darlaghat WLS	6.00	Solan	Black bears, Sambhals, wild boars, red jungle fowls, barking deer
7	Dhauladhar WLS	944.00	Kangra	Nilgai, Sambar, Barking Deer, Wild Buar, Clawless Otter, and Leapord
8	Gamgul Siahbehi WLS	109.00	Chamba	Ibex, bear, langur, leopard, musk deer, Himalayan tahr, Himalayan fox, Himalayan shrew, rhesus macaque, common giant flying squirrel, Indian bush rate, jackal, barking deer
9	Gobind Sagar WLS	100.00	Bilaspur	Singhara, Catla, Jhalli, Grass Crap, Kuni Rohu, Guj, Ticto, Sarina
10	Kais WLS	14.00	Kullu	Serow, blue Sheep, red Fox, musk deer, Goral, ibex, Leopard, snow Leopard, brown Bear, Himalayan black Bear
11	Kalatop-Khajjiar WLS	69.00	Chamba	Ibex, deer, black bears and leopards
12	Kanawar WLS	61.00	Kullu	Serow, blue Sheep, red Fox, musk deer, Goral, ibex, Leopard, snow Leopard, brown Bear, Himalayan black Bear

Sl. No.	Protected Areas	Area (sqkm)	District (s)	Fauna
13	KhokhanWLS	14.00	Kullu	Serow, blue Sheep, red Fox, musk deer, Goral, ibex, Leopard, snow Leopard, brown Bear, Himalayan black Bear
14	Kibber WLS	1400.00	Lahul &Spiti	Ibex and Snow leopard
15	Kugti WLS	379.00	Chamba	Brown bear, Asiatic black bear, Leopard, Himalayan Tahr, Himalayan ibex, Goral, Common Langur, Porcupine
16	Lippa Asrang WLS	349.00	Kinnaur	Yak, Ibex, Leopard, Goral, Blue Sheep, Brown Bear, Musk Deer, Himalayan black Beer
17	Majathal WLS	57.55	Solan	Deer, Bear, Cheer pheasant
18	Manali WLS	32.00	Kullu	Himalayan Black Bear, Himalayan Palm Civet, Barking Deer, Flying Fox, Goral, Indian Hare, Stripped Hyena, Leopard, Himalayan yellow throated Marten, Serow, Kashmir flying Squirrel and Himalayan Tahr.
19	Nargu WLS	278.00	Mandi	Black Bear, Brown Bear, Himalayan Palm Civent, barking Deer, Indian Hare, common Langur, Leopard, Rhesus Macaque, Himalayan yellow throated stone Marten, Indian Porcupine, common giant flying Squirrel, Himalayan Weasel
20	Pong Dam Lake WLS	307.00	Kangra	Nilgai, Sambar, Barking Deer, Wild Buar, Clawless Otter, and Leapord
21	Renuka WLS	4.00	Sirmaur	Asiatic lions, spotted deer, lion tailed macaques, peacocks, nilgai or large grey Indian antelope, barking deer and Himalayan black bears.
22	Rupi Bhaba WLS	738.00	Kinnaur	Serow, blue Sheep, red Fox, musk deer, Goral, ibex, Leopard, snow Leopard, brown Bear, Himalayan black Bear
23	Sainj WLS	90.00	Kullu	Blue sheep, snow leopard, Himalayan brown bear, Himalayan tahr, and Musk deer
24	Sangla Valley (RakshamChitkul)	304.00	Kinnaur	Leopard, blue Sheep, Himalayan black Bear, brown Bear, musk Deer and Gora
25	Sechu Tuan Nala WLS	103.00	Chamba	Ibex, bear, langur, leopard, musk deer, Himalayan tahr, Himalayan fox, Himalayan shrew, Rhesus macaque, common giant flying squirrel, Indian bush rate, Jackal, barking deer

Sl. No.	Protected Areas	Area (sqkm)	District (s)	Fauna
26	Shikari Devi WLS	72.00	Mandi	Himalayan palm civet, barking deer, marten, Indian porcupine, Kashmiri flying squirrel, musk deer, common langur, leopard, the common Squirrel,
27	Shilli WLS	2.00	Solan	Himalayan Black Bear. Except Black Bear, other wild species like Leopards, Musk Deer, Barking Deer, Jackals, Brown Bear and Hyena
28	Shimla Water Catchment WLS	10.00	Shimla	Flying Squirrel, common langur, Serow, Porcupine, Sambar
29	Shri Nainadevi WLS	123.00	Bilaspur	Jackals, Leopards, Rhesus, Himalayan Yellow Throated Marten, Serow, Porcupine, Sambar and Common Giant Flying Squirrel. Wide variety of reptiles namely Indian Cobra, common Indian Krait, North House Gecko and Common Rattle Snake
30	Simbalbara WLS	19.00	Sirmaur	Goral, Sambhar and Chittal
31	Talra WLS	40.00	Shimla	Flying Squirrel, common langur, Serow, Porcupine, Sambar
32	Tirthan WLS	61.00	Kullu	Serow, blue Sheep, red Fox, musk deer, Goral, ibex, Leopard, snow Leopard, brown Bear, Himalayan black Bear
33	Tundah WLS	64.00	Chamba	Ibex, bear, langur, leopard, musk deer, Himalayan tahr, Himalayan fox, Himalayan shrew, rhesus macaque, common giant flying squirrel, Indian bush rate, jackal, barking deer

At present, there are 2 National Parks, 30 Wildlife Santuaries and 3 Conservation Reserves. The details are as under:

Table 16 Protected area in the state of HP

S.No.	Category of Protected Area	Area in Sq.Km
1	National Parks	1440
2	Wildlife Sanctuaries	6226.83
3	Conservation Reserves	19.17

2.4.13 Horticulture in the state of HP

Fruits

At present more than 30 types of fruits are being grown in the state. the state is known for the Apple, Walnut, Kiwi fruit, Strawberry etc. The table below gives an account of the fruit growing areas elevation wise.

Table 17 Fruit growing areas and species of HP

S No	Description of Zone	Elevation	Rainfall	Fruit Species
1	Low hill and valley	365-914	600-1000	Mango, Litchi, Guava, Loquat, Citrus, Papaya, Jackfruit, Plum, Peach, Pear, Strawberry etc.
2	Mid Hills	915-1523	900-1000	Stone fruits, (Plum, Peach, Apricot, Almond), Persimmon, Pear, Pomegranate, Walnut, Kiwi fruit, Strawberry
3	High Hills and temperate zone	1524-2742	900-1000	Apple, Pear, Cherry, Almond, Walnut, Chestnut, Hazelnut, Strawberry
4	Cold and dry zone (Dry Temperate)	2743-3656	240-400	Apple, Grapes, Prunes, Apricot, Chilgoza, Almond, Pistachio, Walnut, Chestnut, Hazelnut

Source: SoER, Himachal Pradesh, 2013

Table 18 Summary of analysis of baseline and its implication on ESMF

Environmental Baseline	Environmental Issue of the project	Implications for ESMF
Climatic Variability	Rise in temperature, Irregular precipitation, seasonal irregularity	Fruit Production, Crop shifting
Land	Land use change, land erosion, land degradation	Around 10000 Ha additional land to be planted with apple and other fruit species
Pesticide usage	Health and safety issue of pesticide, toxicity, water pollution	Increased usage of pesticides due to increased area and introduction of new varieties
Forest Cover	No change	Risk of encroachment to forest areas, No implication
Water	Stress on water resources, Water solution	Water for irrigation would be required
Irrigation	Tapping of natural source of water, Stress on the existing water resources	Preparation of EMP

Agriculture and farming systems	More farmers to be engaged Switching from traditional varieties to new one Switching from agriculture to horticulture	

Table 19 *Summary of key environmental issues of the state and implications for ESMF*

Environmental Baseline	**Environmental Issues from review of baseline data**	**Implications for ESMF**
Climatic Variability	• Increased temperature at higher altitudes • Irregular precipitation, seasonal irregularity • More intense rainfall and drought period • Changes in suitability of crops at different altitudes e.g. Apples.	Insurance schemes and climate smart investments should be designed to address climatic variability. Soil and water conservations methods and rainwater harvesting aim to address the severity of the drought period.
Land	• Soil fertility decreasing with monoculture • High grazing pressure in all regions of the state • Significant areas in some agro-climatic zones are affected by poor soil health (overuse of chemical fertilizers)	The ESMF will have provisions for soil and water conservation, soil health management, fencing (prevent grazing) and measures for safe and efficient fertilizer use, and to reduce the reliance on chemical fertilizers.
Pesticide usage	• Over reliance on chemical pesticides • Increased usage of pesticides due to increased area and introduction of new varieties • Increased use of fertilizers, pesticides etc. leading to chances of pollution of	ESMF provides guidelines for Integrated Soil and Nutrient Management and Integrated Pest Management Strategy-introduced and adopted early in the project.

	potable water sources	
Water	• Increased occurrence of water shortages/drought leading to impacts on rainfed cropping.	ESMF provides guidelines for design criteria for water structures and to enhance soil and water conservation. The project will finance water harvesting structures, irrigation, and improved agriculture technologies to meet the demands during the drought period. To prevent the contamination of residual chemicals from insecticides and pesticides the concept of integrated crop management (ICM) covering pest management (IPM) be promoted.
Irrigation	• Loss of some perennial sources of potable water and irrigation. • Irrigation is critical for agricultural growth and stability since rainfall only occurs for 3-4 months. • In some areas, there is absence of irrigation facilities together with lack of markets, infrastructure.	ESMF provides guidelines for design criteria for water structures and water usage and to enhance soil and water conservation. The project will finance water harvesting structures, irrigation, and improved agriculture technologies to meet the demands during the drought period. The project will Improve irrigation and on farm water use efficiency in existing schemes

The above mentioned issues would be dealt with comprehensively in the ESMF, the ESMF not only provides guidance on mitigating the impact of these issues but also provides a process for ensuring that the Environment Guidelines are applied at various stages to ensure compliance and bring about the desired mitigation.

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3.0 RELEVANT LAWS, REGULATIONS AND DEVELOPMENT PROGRAMMES

3.1 Applicable World Bank Policies

Applicable acts, notifications, and policies relevant in the context of the project are discussed below in Table 20. The Project Authority will ensure that project activities implemented are consistent with the national, state, local regulatory/legal framework.

Table 20 Summary of regulatory framework in respect of environment and their applicability to the project

World Bank Operation policy/Bank practice	Applicability	Explanation	Relevance/Implications for ESMF
Environmental Assessment OP/BP 4.01	Yes	Some of the activities and approaches that the project would finance have the potential to influence both the environmental setting and social fabric within a given landscape and, therefore, an assessment is required triggering this policy. The proposed project poses no serious risk in changing the natural environment and landscapes within its boundaries as bulk of the investments will take place in established orchards and farms. However, some of the activities and approaches that Himachal Pradesh Horticulture Developmental Project would finance have the potential to influence both the environmental setting and social fabric within a given landscape and, therefore, an assessment is required triggering this policy. The potential impacts need to be identified and mitigated for ensuring sustainability of investments. The project has provisions of introduction of cultivars of foreign origin and their demonstration trial in the nurseries may have environmental concerns, which may need to be looked upon. The	As the Project involves multiple subprojects, various phases and spread over a long period of time. The ESMF is a requirement for HP HDP under the Banks OP/4.01. The potential impacts need to be identified and mitigated for ensuring sustainability of investments. The project has provisions of introduction of cultivars of foreign origin and their demonstration trial in the nurseries may have environmental concerns, which may need to be looked upon. The Environmental and Social Assessment and Management Framework will be developed to identify and assess the impacts besides developing the appropriated action to mitigate the potential impacts.

World Bank Operation policy/Bank practice	Applicability	Explanation	Relevance/Implications for ESMF
		Environmental and Social Assessment and Management Framework will be developed to identify and assess the impacts besides developing the appropriated action to mitigate the potential impacts.	
Natural Habitats OP/BP 4.04	A	Even though the project will not take up any activities inside critical natural habitats and protected areas, some of the proposed investments, particularly expanding area under horticulture increases the risk of encroachment into natural areas. Other planned infrastructure and agro-marketing infrastructure could be located in the proximity of natural areas and if not developed appropriately, could adversely impact these. The ESMF specifically requires protected areas National Parks, Wildlife Sanctuaries to be excluded from the project.	Project site selection criteria will ensure no sites are selected within critical natural habitats. The sub project specific EMP will monitor effects on natural habitat and biodiversity
Forests OP/BP 4.36	No	Proposed investments are unlikely to result in any changes in forest management practices and will not finance clear felling of forestlands.	No activity would be allowed in the forest area.
Pest Management OP 4.09	Yes	This policy is triggered as the use of chemical fertilizers and pesticides is prevalent at various stages of apple and vegetable cultivation in the State. Since the project is primarily intended to enhance productivity through technological and managerial interventions, there are chances of increased use of chemical fertilizer and pesticides resulting in significant impact on the local environment including implications for the quality of soil and moisture regime, water environment, public health as well as livestock population. To prevent and control the chances of increased use of pesticides by	The ESMF will include an IPM strategy ESMF will contain a banned list of pesticides and insecticides as well as guidelines for pesticide management to be shared from state PCU to user group level.

World Bank Operation policy/Bank practice	Applicability	Explanation	Relevance/Implications for ESMF
		farmers, there is a need of greater public awareness and understanding in the areas of interventions, besides change in existing practices entailing extensive use of chemical and pesticides. An Integrated Pest Management Plan is developed for proposed interventions. No banned pesticides (formulated products that fall in WHO classes IA and IB, or formulations of products in Class II) would be procured under the project.	
Physical Cultural Resources OP/BP 4.11	**No**	There is no excavation planned and investments will not impact existing Physical Cultural Resources.	Project activities will not undertake construction, excavation at sites that are culturally significant
Safety of Dams OP/BP 4.37	No	There are no investments on new and/or existing dams.	No implication
Projects on International Waterways OP/BP 7.50	Applicatble	The proposed investments under the project, including small and micro irrigation investments, are not at scale that may impact flows in the major rivers. However, this will be assessed during the course of project preparation.	As per the policy requirement, the riparian countires have been notified
Projects in Disputed Areas OP/BP 7.60	No	There are no disputed areas in the project areas.	

3.2 Policy and Regulatory Framework of GoI and GoHP

Table 21 National and State regulateon applicable under the project

Act/Policy	Year	Objective	Applicability	Authority
Environment (Protection) Act and amendments	1986	To protect and improve the overall environment	The project will have investments on processing plants, market yards, cold supply chain development that may require clearances from the State Pollution Control Boards (SPCB)	MoEFCC, CPCB
Notification on Environment Impact	2006	To provide environmental		MoEFCC, CPCB,

Act/Policy	Year	Objective	Applicability	Authority
Assessment of Development projects (and amendments) (referred to as the Notification on Environmental Clearance)		clearance to new development activities like ware houses more than 20,000 SQM following environmental impact assessment.	The project Is investing in activities such as market yards, supply chain infrastructure, pack houses and access roads that require standalone EIA;	HPPCB, and State Environmental Impact Appraisal committee
Forest (Conservation) Act	1980	To protect and manage forests	Risk of Encroachment because the farmland are near to forest areas	MoEFCC, and State Forest Dept
Water (Prevention and Control of Pollution) Act (and subsequent amendments)	1974	To provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water.	The project will have investments on supply chain and market infrastructure, market yards, agri processing, units that may increase wastewater flow-Proper measures as per the requirement of the Act will have to be Incorporated.	CPCB, and HPPCB
Air (Prevention and Control of Pollution) Act (and subsequent amendments)	1981	To provide for the prevention, control and abatement of air pollution, and for the establishment of Boards to carry out these purposes.	The project will involve construction of infrastructure which can result in air pollution, and their clearance may be required by the Project.	CPCB, HPPCB, and Transport Department
The Municipal Solid Waste (Management and Handling) Rules,	2000	The rule facilitates and provides methods to manage the Municipal Solid Wastes in an efficient and reusable manner.	As project investments will involve construction of CSCs, supply chain infrastructure, pack houses and processing centers, Generation and disposal of solid waste under different components will need to be managed in line with the rules.	MoEFCC, CPCB, and HPPCB
The Noise Pollution (Regulation and Control) Rules, and amendments	2000	Work place noise is covered under Indian factories Act, 1948 but this rule provides safety against noise in ambient condition with generation of noise by certain point and area source.	Project activities may lead to generation of Noise due to construction activity, packing and grading houses, CA stores and operation of DG sets for power backup, loading in the market yards	MoEFCC, CPCB, and HPPCB
Fly Ash notification	2007	Fly ash bricks in construction activities, Responsibilities of Thermal Power Plants and Specifications for use of ash-based products/ responsibility	The project will involve Construction activities under infrastructure development for Grading/packing, CA	MoEFCC, CPCB, and HPPCB

Act/Policy	Year	Objective	Applicability	Authority
		of other agencies	store and market yards	
Plant Quarantine (Regulation of Import into India) Order	2003	The order ensure and regulate the import of plants, root stocks, GM species and its quarantine in India.	The project will involve Import and multiplication of root stocks and cultivars, which will be quarantined in govt. owned nurseries. The process under the Plant Quarantine Order will need to be followed.	Ministry Of Agriculture (Department of Agriculture & Cooperation)
Post-entry Quarantine	2003	Section IV of the Plant Quarantine (Regulation of Import into India) Order, 2003 Every application for certification of post-entry quarantine facilities shall be submitted to the inspection authority in Form PQ 18. The inspection authority if satisfied after necessary inspection and verification of facilities shall issue a certificate in Form PQ 19.	The project will involve Import and multiplication of root stocks and cultivars, which will be quarantined in govt. owned nurseries. The process under the Plant Quarantine Order will need to be followed.	Ministry Of Agriculture (Department of Agriculture & Cooperation)
Quarantine Treatments and Application Procedures: I. Methyl Bromide Fumigation	2005	NSPM 11	The project will involve Import and multiplication of root stocks and cultivars, which will be quarantined in govt. owned nurseries. The process under the Plant Quarantine Order will need to be followed.	Ministry of Agriculture
Protection of Plant Varieties and Farmers' Rights Act	2001	he Protection of Plant Variety and Farmers Right Act, 2001 (PPVFR Act) is an Act of the Parliament of India enacted to provide for the establishment of an effective system for protection of plant varieties, the rights of farmers and plant breeders, and to encourage the development and cultivation of new varieties of plants.	Such protection is likely to facilitate the growth of the seed industry which will ensure the availability of high quality seeds and planting material to the farmers.	Parliament of India
H.P Fruit Plant Nurseries Regulation and Amendment Act.	2015	An Act to provide for the registration of fruit nurseries in Himachal Pradesh	Nursery owners shall not engage in the production and sale of nursery plants or plant material without getting himself or his firm registered with the competent authority and without obtaining a licence, in the form	GoHP

Act/Policy	Year	Objective	Applicability	Authority
			prescribed.	
National Forest Policy,	1988	Keeping the forest area intact in the Himalayan states- This policy implies to maintain the 66.7% of land under forest area in HP. This project does not involve any forest land.	No project activities will be implemented/carried out on forest land. This policy needs to be complied with.	MoEFCC,
National Agriculture Policy	2000	National Agriculture Policy seeks to actualize vast untapped growth potential of Indian Agriculture, strengthen rural infrastructure to support faster agricultural development, promote value addition, accelerate the growth of agro-business create employment in rural areas, secure a fair standard of living for farmers and agricultural workers and their families, discourage migration to urban areas and face the challenges arising out of economic liberalization and globalization.	The project aims to improve agricultural productivity and farm incomes by integrating technology, institutions and market innovations.	Ministry of Agriculture
National Water Policy	2002	To ensure that planning, development, and management of water resources are governed by national perspectives	As project financed investments will involve development of new minor community irrigation systems and remodeling, improvement and strengthening of existing systems.	MoWRRDGR
National Horticulture Mission	2005	The NHM's key objective is to develop horticulture to the maximum potential available in the state and to augment production of all horticultural products (fruits, vegetables, flowers, coco,cashewnut,plantation crops, spices, medicinal aromatic plants) in the state		GoI
Building and Other Construction Workers (Regulation of Employment and conditions of Service) Act.,	1996	To regulate the employment and conditions of service of building and other construction workers and to provide for their safety, health and welfare measure and for other matter connected therewith or incidental	As project financed activities will involve labour in construction and development of infrastructure for the project this policy is applicable and should be followed	Ministry of Labour and Employment
Central Motor Vehicle Act Central Motor Vehicle Rules	1988 1989	To control vehicular air and noise pollution. To regulate	Operation of vehicles in carriage and construction	Motor Vehicle Department

Act/Policy	Year	Objective	Applicability	Authority
		development of the transport sector, check and control vehicular air and noise pollution.	activities in the project	
Environment Master plan, Himachal pradesh	2013	Protection of environment in the state, ensure the sustainability of environmental heritage and natural resources and to develop a long term perspective of achieving environmentally sustainable Development.	Agriculture and Horticulture sectors are covered under Natural resource management	HP State Council For Science, Technology & Environment
Roof-top Rain Water Harvesting	1999	Rain water harvesting in the state	Any infrastructure facility more than 1000m plinth area	HP State Council For Science, Technology & Environment
Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995	1995	Ban on non-biodegradable garbage including plastics	The project may use non-biodegradable material for crates and packing material, however these will be reused in its life cycle and their applicability for use will also be assessed during project implementation phase.	HP State Council For Science, Technology & Environment
Insecticide Act 1968; Insecticide Rules 1971; Insecticide (Control) Order 1985; Fertilizer Control Order 1985; Fertilizer Movement Control Order 1973; Essential Commodities Act (Amended - 1986)		The GOI has notified various Acts for the control and Prevention of pollution due to pesticides and fertilizers.	As project investments are likely to involve use of pesticides, ferticlizers and insecticides, provisions of some of these would be relevant.	

Table 22 Review of social regulations and their relevance to Project

Legislation (Year)	Objective	Provisions	Relevance/ Applicability to Project
National level			
Article 366 (25) of the Constitution of India Article 244(1) of Constitution	Article 366 (25) refers to Scheduled Tribes as those communities, who are scheduled in accordance with Article 342 of the Constitution, wherein communities shall be declared as such by the President through an initial public notification or through a subsequent amending Act of Parliament. The Fifth Schedule under Article 244(1) of Constitution defines "Scheduled Areas" as such areas as the President may by order declare to be Scheduled Areas after consultation with the Governor of that State.	Defines following essential characteristics, for a community to be identified as Scheduled Tribes are; • Indications of primitive traits; • Distinctive culture; • Shyness of contact with the community at large; • Geographical isolation; and • Backwardness. The criteria for declaring any area as a "Scheduled Area" under the Fifth Schedule are; (a) preponderance of tribal population, (b) compactness and reasonable size of the area, (c) a viable administrative entity such as a district, block or Taluka, and (d) economic backwardness of the area as compared to the neighbouring areas	**Applicable** as some of the project interventions would be in tribal dominated areas, besides in other areas where tribal population is dispersed
Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 and HP State level policies	aims to ensure, a humane, participative, informed and transparent process for land acquisition with least disturbance to the owners of the land and other affected families and provide just and fair compensation to the affected families whose land has been acquired or proposed to be acquired or are affected by such acquisition and make adequate provisions for such affected persons for their rehabilitation and resettlement and for ensuring that the cumulative outcome of compulsory acquisition	The Act • defines affected family, interested persons, project area, • details process to define public purpose and social impact, steps towards notification and acquisition • Provides institutions (Appraisal committee, R&R administrator, R&R Commissioner; National Committee for Monitoring for Rehabilitation and Resettlement; LARR Authority, etc.) • details factors for consideration to determine market value of assets; solatium & multiplication factors applicable; and infrastructural amenities at resettlement site; apportionment and payment of compensation	**Not applicable**all project interventions are planned either on land already belonging to government/project implementing agencies or taken voluntarily from communities or on lease

Legislation (Year)	Objective	Provisions	Relevance/ Applicability to Project
	should be that affected persons become partners in development leading to an improvement in their post acquisition social and economic status		
Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	framed to recognize and vest the forest rights and occupation in forest land in forest dwelling STs and other traditional forest dwellers who have residing in such forests for generations but whose rights could not be recorded. Its main objective is to facilitate the overall development and welfare of the tribal people by empowering them socially, economically and politically without any impact on their culture, habitation and tradition and in terms of their age old rights and privileges.	The Act provides three kinds of rights to Scheduled Tribes and Other Traditional Forest Dwellers: Land Rights: Right to continue cultivating land (less than or equal to four hectares) where they have been cultivating prior to 13 December 2005; Use Rights: Provides for rights to use and/or collect a) minor forest produce (tendu patta, herbs, medicinal plants) that has been traditionally collected, b) Grazing grounds and water bodies, c) Traditional areas of use by nomadic or pastoralist Communities Right to protect and conserve. Gives the community the right to protect and manage the forest.	**Not applicable** as no such project activities are proposed at present. Further such locations, if any are planned would be included in negative list of project
National Policy on Tribal Development, 1999	It seeks to bring scheduled tribes into the mainstream of society through a multi-pronged approach for their all-round development without disturbing their distinct culture Development.	It lists out measures to be taken in respect of: formal education, traditional wisdom, displacement and resettlement, forest villages, shifting cultivation, land alienation, intellectual property rights, tribal languages, Primitive tribal groups, scheduled tribes and schedule areas, administration, research, participatory approach and assimilation	**Applicable** as the policy will be applicable to project activities across the state wherein dispersed population exist besides in certain tribal dominated districts.
Panchayati Raj Act 1953, 73rd Amendment 1994	The act leads towards village governance and establish the bottom up approach. The Panchayati Raj Institutions considered as self Government for rural areas whether at the level of a village or a block or a district.	The Act aims to provide a 3-tier system of Panchayati Raj for all States having a population of over 2 million, to hold Panchayat elections regularly every 5 years, to provide seats reservations for scheduled castes, scheduled tribes and women; to appoint a State Finance Commission to make recommendations regarding the financial powers of the Panchayats and to constitute a District Planning Committee, to prepare a	**Applicable** as some of the demand-driven project interventions such as irrigation infrastructure would be subject to these provisions

Legislation (Year)	Objective	Provisions	Relevance/ Applicability to Project
		development plan for the district. The 3-tier system of Panchayati Raj consists of:Village-level Panchayats; Block-level Panchayats and District-level Panchayats. Besides, it indicates the powers and responsibilities and also sources of funds	
Extension of Panchayati Raj to Scheduled Areas (PESA) 1996	to cover the "Scheduled areas", which are not covered in the 73rd amendment or Panchayati Raj Act of the Indian Constitution.	Key provisions include: • state legislation on panchayats in the scheduled area should take care of the customs, religious practices and traditional management practices of community resources • Every village shall contain a grama sabha whose members are included in the electoral list for the panchayats at village level • Planning and management of minor water bodies are entrusted to the panchayats	**Applicable** as project interventions are planned in Scheduled Areas of the state and these provisions have been applicable to these areas since 1996
Right to Information Act, 2005	Providesa practical regime of right to information for citizens to secure access to information under the control of Public Authorities.	The act sets out • obligations of public authorities with respect to provision of information; • requires designating of a Public Information Officer; • process for any citizen to obtain information/disposal of request, etc • provides for institutions such as Central Information Commission/State Information Commission	**Applicable** as all documents pertaining to the project would be disclosed to public
National Agricultural Policy, 2000	The National Policy on Agriculture seeks to actualise the vast untapped growth potential of Indian agriculture, strengthen rural infrastructure to support faster agricultural development, promote value addition, accelerate the growth of agro business, create employment in rural areas, secure a fair standard of living for the farmers and agricultural workers and	Provides approach for sustainable agriculture, food and nutritional security, generation and transfer of technology; inputs management and incentives for agriculture, Generation and Transfer of Technology, management reforms, institutional structure	**Applicable** as project would comprise many of the features enunciated in the policy

Legislation (Year)	Objective	Provisions	Relevance/ Applicability to Project
	their families, discourage migration to urban areas and face the challenges arising out of economic liberalization and globalisation		
National Policy for farmers, 2007	Sets goals such as to: (i) improve economic viability of farming by substantially increasing the net income of farmers and to ensure that agricultural progress is measured by advances made in this income. (ii) To protect and improve land, water, bio-diversity and genetic resources essential for sustained increase in the productivity, profitability and stability of major farming systems by creating an economic stake in conservation. (iii) To develop support services including provision for seeds, irrigation, power, machinery and implements, fertilizers and credit at affordable prices in adequate quantity for farmers., etc.	• defines farmers that include tribal families / persons engaged in shifting cultivation and in the collection, use and sale of minor and non-timber forest produce • prescribes assets reforms required to empower farmers such as land, water, livestock, • provides for support services including credit, climate change, agricultural practices, etc.	**Applicable** as project would comprise many of the features enunciated in the policy
State Level			
The Himachal Pradesh Transfer of Land (Regulation) Act, 1968	Objective is to ensure protection to tribes in respect of their possession of land	It provides that "No person belonging to an Scheduled Tribe transfer his interest in any land by way of sale, mortgage lease, gift or otherwise to any person not belonging to such tribe except with the previous permission in writing of the Deputy Commissioner, excepting i) by way of lease of a building on rent; ii) by way or mortgage for securing loan to any Cooperative land Mortgage bank or cooperative society (all or majority members belonging to any ST) or by acquisition by the state government	The act is applicable as the act's coverage extends to whole districts of Lahaul and Spiti and Kinnaur and to the sub-tehsils of Pangi and Bharmour in Chamba district

Legislation (Year)	Objective	Provisions	Relevance/ Applicability to Project
		under LA act". Right, title or interest held by persons belonging to Scheduled Tribes in land are not be attached except when the amount due under such decree or order is due to the state government or to any cooperative land mortgage bank or cooperative society.	
Land Reforms Legislations - HP Village Common Land Vesting and Utilization Act,1974	to stream line the utilization of village common lands popularly known as 'Shamlat Land '.	Under this act, following categories of land were vested in the State Government Those areas which were vested in a Panchyat under section 4 of the Punjab Village Common Land (Regulation) Act, 1961, as enforced in merged areas of Himachal Pradesh under section 5 of the Punjab Re-organisation Act, 1966. This precluded lands used or reserved for the benefit of village community including streets, lanes, play-grounds, Schools, wells and ponds within Abadideh or Gohrdeh; areas which were described in the Revenue records as shamlat taraf, patties and thola, and not used as per revenue records for the benefit of the village community or a part thereof for community purposes of the village; Areas which were described in revenue records as shamlat, shamlat, deh, taraf, shamat, shamlat chak and patti. This applied in respect of those areas which comprised Himachal Pradesh immediately before November 1, 1966. Through an amendment made later, the vested land can now also be transferred to some other Departments, of the State Government or can be given on lease to an individual in connection with development activities of the state.	**Applicable** as some of the lands with the implementing 'could' be subject to provisions of this act
H.P. Tenancy and Land Reforms Act, 1972: Section 118 of Act Himachal Pradesh Tenancy and Land Reform Rules, 1975.	provides for restriction on transfer of land in favour of a person who is not an agriculturist of the State	amendments in Rule 38-A (a)(2) of the Himachal Pradesh Tenancy and Land Reform Rules, 1975 provides that for all purposes, other than for a dwelling unit or shop, any non-agriculturist seeking to acquire land with permission under section 118 of Himachal Pradesh Tenancy and Land Reform Act 1972, shall need an essentiality certificate (EC) from the concerned department that will certify his	

Legislation (Year)	Objective	Provisions	Relevance/ Applicability to Project
		eligibility. It must also be stated that land required is as per norms and that NOCs from all relevant departments and authorities including Local Bodies have been obtained. In effect, for certain purposes like agriculture/horticulture use where no EC was required, this has been brought in	
Himachal Pradesh Lease Rules, 2013	Provides for leasing of land and to be granted only in the interests of the development of State,	The land may be granted on lease for purposes and to persons as provided under these rules with the sanction of the competent authority, out of land vested with the State Government under Section 3 (HP Village Common Lands Vesting and Utilization Act) or the land vested under section 11 (HP Ceiling on Land Holdings Act, 1972 (Act No.19 of 1973), in the interest of the development of the State.The land vested with the Government under the Acts, which is encroached, shall not be leased out to the encroacher. The lease may be granted only in the interests of the development of State, if the State Government is satisfied that there are sufficient reasons to do so. The development of State shall include amongst others: location of the specific infrastructure projects, any other common purpose in the interest of the development of the State and shall include the traditional cultural activities of the State of Himachal Pradesh.In Scheduled areas the lease application to the concerned Gram Sabhas for consultation and would be processed further only after obtaining the Gram Sabha's resolution in this regard.	Applicable as during project implementation, the project may require to lease land
The Himachal Pradesh Agricultural & Horticultural Produce Marketing (Development & Regulation) Act, 2005	an act to re-enact the law to provide for improved regulation in marketing of agricultural produce, development of efficient marketing system, promotion of agri processing and agricultural exports, establishment and proper administration of	Provides for • regulation of trading and contract farming that includes: developing and regulating the marketing of notified agricultural produce; Market yards, sub-market yards, farmer's, consumer's and private market yards; • Establishment of private yards and direct purchase of agricultural produce from agriculturists; Sale of	Upgradation, modernization of existing market yards and establishment of green-field markets are proposed under the project.

Legislation (Year)	Objective	Provisions	Relevance/ Applicability to Project
	markets for agricultural produce in the State of Himachal Pradesh and to ensure level playing field for competitive markets to operate through setting of minimum standards for facilities, procedures and systems, thereby promoting the establishment of well administered and efficient infrastructure for marketing of agricultural produce in and from the State	notified agricultural produce in the market; • Control provisions such as Assessment of market fee; Power to stop vehicles and inspect, Power to remove encroachments in the market yard etc.	
Results Framework Document for Tribal Development Department (2015-16)	The vision of this RFD is to ensure Socio-economic development of Scheduled Tribe population with a view to bridge the Socio-economic gap between Scheduled Tribe and General population. The mission is to facilitate the up-gradation of levels of administration and improvement of socio-economic infrastructure in Scheduled Areas as well as tribal population concentrated areas through area and population targeted approaches with a view to empower the tribals socio-economically to be at par with general population with special emphasis for women.	The Annual RFD accords weightage, set of actions, success indicators and target ratings (Poor to Excellent) to each of the following functions: All matters relating to planning generally e.g. assessment of resources, formulation of plans, laying down of targets and physical aspects and co-ordination in relation to matters affecting the tribal areas and the Scheduled Tribes of the State. (TSP); Periodical assessment and evaluation of Plan activities in relation to matters affecting the tribal areas and the Scheduled Tribes of the State. (Tribal Advisory Council, PAC, Boards); All policy matters including introduction of new schemes affecting the tribal areas and the Scheduled Tribes and consultation thereof by all administrative departments with the Tribal Development Department. (Matters relating to Tribal Advisory Council; Matters relating to the Himachal Pradesh Transfer of Land(Regulation) Act,1968; Matter relating to the Welfare of Scheduled Tribes; Scheduled Castes and Scheduled Tribes(Prevention of Atrocities) Act,1989 with respect to Scheduled Tribes; Administration and Control of Scheduled Areas and Scheduled Tribes including Single Line Administration; and Matters relating to Integrated Tribal	Applicable as this document would incorporate/support some of the project level interventions

Legislation (Year)	Objective	Provisions	Relevance/ Applicability to Project
		Development Projects (ITDPs)	
Single Line Administration in ITDP areas of Kinnaur, Lahaul Spiti and Bharmaur	To provide single line administration to the ITDP areas of the state	Provides for Deputy Commissioner/Additional DC to exercise all powers of Head of the departments in respect of all officers posted in their area	Applicable as project interventions are planned in these areas and implementation would require support from DC/ADC
The World Bank			
Operational Policy 4.10 on Indigenous Peoples	ensures that indigenous population benefits from development projects and those projects' potentially adverse effects are avoided or mitigated and prescribes elements for a tribal development framework or tribal development plan	The World Bank defines Indigenous Peoples (IPs) by the following criteria:Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories; Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; An indigenous language, often different from the official language of the country or region;and Identification by the Borrower Country as an Indigenous Group. It seeks the borrower to engage in a process of free, prior and informed consultation.	Applicable as project interventions are to take place in tribal areas of the state
World Bank's Policy on Access to Information	This Policy governs the public accessibility of information in the Bank's possession that is not on a list of exceptions	Policy is based on five principles • Maximizing access to information; • Setting out a clear list of exceptions; • Safeguarding the deliberative process; • Providing clear procedures for making information available; and • Recognizing requesters' right to an appeals process. The policy outlines a clear process for making information publicly available and provides a right to appeal if information-seekers believe they were improperly or unreasonably denied access to information or there is a public interest case to override an exception that restricts access to certain information.	WB is required to disclose Project related information during preparation and implementation as per this policy

3.3 List of Statutory Clearances and Authorizations that may be required

Table 23 List of Statutory Clearances and Authorizations that may be required

S. No.	Activity	Statute	Requirement	Competent Authority	Responsible Agency for Obtaining Clearance	Time Required
Pre-Construction Stage (Responsibility: HP-HDP)						
1	Tree cutting from non-forest area	Forest Conservation Act 1980 & MOEFCC Letter Dt. 18.02.98	Permission for tree cutting	Local Forest Authority	PMU, HP-HDP	3-5 months
2	Post entry quarantine order	2003	PEQ	Dept of Agr, Govt of India	Head of Dept, Plant Pathology, Horticulture University, Solan	1-2 years
Construction Stage (Responsibility: Contractor/HP-HDP)						
1	Establishing stone crusher, hot mix plant, wet mix plant and Diesel Generator Sets	Water Act of 1974, Air Act of 1981, Noise Rules of 2000 and Environmental Protection Action of 1986 and as amended	Consent-for-establishment	Himachal Pradesh Pollution Control Board(HPPCB)	The Contractor	2-3 months
2	Operating stone crusher, hot mix plant, wet mix plant and Diesel Generator Sets	Water Act of 1974, Air Act of 1981, Noise Rules of 2000 and Environmental Protection Action of 1986 and as amended	Consent-for-operation	HPPCB	The Contractor	2-3 months
3.	Storage of fuel oil, lubricants, diesel etc. at	Manufacture storage and Import of	Permission for storage of hazardous	HPPCB	HP-HDP	2-3 months

S. No.	Activity	Statute	Requirement	Competent Authority	Responsible Agency for Obtaining Clearance	Time Required
	construction camp	Hazardous Chemical Rules 1989	chemical			
4	Quarry operation	State Minor Mineral Concession Rules, The Mines Act of 1952, Indian Explosive Act of 1984, Air Act of 1981 and Water Act of 1974	Quarry Lease Deed and Quarry License	State Department of Mines and Geology	HP-HDP	2-3 months
5	Clearance for Mining Operation and Building Construction	EIA Notification, 2006 and Amendment in vide OM No.L-11011/47/2011-1A.II(M) dated 24.06.2013	1. Mining below 5 Ha (B2 Category) 2. Building above 20000 sqm	HP SEIAA/SEAC	HP-HDP	2-3 months
6	Extraction of ground water	Ground Water Rules of 2002	Permission for extraction of ground water for use in road construction activities	State Ground Water Authority	HP-HDP	2-3 months
7	Engagement of labour	Labour Act	Labour license	Labour Commissioner	HP-HDP	2-3 months

4.0 STAKEHOLDER CONSULTATIONS AND DISCLOSURE

Stakeholder consultations were held to ascertain likely social and environmental issues that need to be addressed during project preparation; understand current practices from production to marketing, validate findings from desk reviews, understand perceived benefits of the various interventions, awareness regarding government schemes, constraints faced, prevalent government schemes, etc. Details are presented in ensuing sections.

4.1 Typology of stakeholders

The Stakeholder Consultation process considered a number of stakeholders who were engaged at different levels. The purpose was to ascertain their relevance and role in HPHDP during preparation and later during implementation. **Table 24** presents the stakeholder analysis:

Table 24 Stakeholder Analysis

Stakeholder type	Importance in HPHDP	Rationale for consultation
Farmers women members of Self Help Groups (SHGs), Tribal Farmers, leaders,	These are persons mostly engaged in farming across the state and would be covered under the project interventions	While certain project interventions are already identified within tribal blocks, all such persons have varied experiences relating to farming, marketing of produce and have latent needs and demands that could be covered under the project design and processes such as need for training on different crops, need for irrigation infrastructure, market yards, etc. Hence they were consulted to understand their concerns, previous experiences, expectations and suggestion on livelihoods restoration.
Farmers Producer Organization (FPOs), Water User Association (WUA), Krishi Vikas Sangh (KVS) Producers, Farmer Interest Groups (FIG), Cooperative societies, Non Government Organization(NGOs)	These are persons currently practicing farming as a group or formed as a cooperative and have experiences in either collective procurement of farm inputs and marketing of produce, import and sale of rootstocks, setting up Polyhouses and/or forming water associations for setting up of irrigation infrastructure. While some of them practice horticulture others are engaged in vegetable and/or floriculture.	Such already formed group/cooperatives with varied levels of awareness give the project an opportunity to introduce the project interventions and help scale up. NGOs already operational in the area and involved in community mobilization would be key stakeholders in spreading awareness.
Horticulture Development (Subject Matter specialist, HDO, HEOs), Block Development Officers, Agriculture	These officials who are part of the project implementing agency, would be key to assessment of demand, planning and implementation of all proposed project interventions.	To inform on the proposed project and understand their present roles and responsibilities, constraints faced by these officials, need for capacity building were noted for proposing measures under the ESMF

Stakeholder type	Importance in HPHDP	Rationale for consultation
Department		
HPMC, Regional Horticulture Research and Training Station, Dr. Y. S. Parmar University Mashobara	HPMC facilities (for sorting, grading and processing of apples and other fruits) are an important infrastructure. Under the project while there would be a few new facilities, many are being proposed upgradation/expansion wherein locals (males and females) are engaged. The University is one of the implementing agencies for the project	Features regarding upgradation/expansion of HPMCs were noted in respect of their requirement/availability of land. As the University was providing inputs for safe and timely use of pesticides and nutrient management as well as conducting research on apple mites and soil diseases. Practices relating to PEQ nursery

4.2 Aims of Community Meetings and Institutional Consultations

Table 25 Aims of Stakeholder Consultations

Community Level	Institutional Level
Create general public awareness amongst the potential beneficiaries about HPHDP	To learn about the current and best local level practices from district officials and cooperatives
Broadly explain the project processes and planned interventions	to learn about the current available schemes offered by departments - horticulture, irrigation and agriculture.
Elicit communities support to the project and Increase HPHDP acceptability	to learn about the current challenges faced in terms of accessibility, awareness regarding pesticides, fumigants and other farm inputs schemes
Understand communities' current practices from procuring of inputs to marketing of produce - their experiences, success	Assess institutional capacity to plan and implement project interventions
Understand constraints faced, needs for training, exposure, capacity building	

4.3 Outcomes of Stakeholder interactions

Key Issues from stakeholders, responses provided and their incorporation in the ESMF is provided in Table 26 Key Issues from stakeholders, responses provided and their incorporation in the ESMF.

Table 26 Key Issues from stakeholders, responses provided and their incorporation in the ESMF

Stakeholders	Participants	Key issues discussed
Mahakali Farmer Cooperative , Jubal Hatti	Cooperative members, Department of Horticulture	• Need sustainable water supply either through rain-water harvesting/lift irrigation and storage, • bigger cold storage to store different commodities at different temperatures is essential to improving shelf life • Longer shelf life can be ensured by transportation through the more expensive 'Reefer' vans rather than routine trucks. • Protective cultivation is extremely profitable though support is needed in identifying and subsidizing on farm irrigation schemes. • wildlife conflict has been a concern with monkeys and other animals damaging crops • expect technical training on new technology and pesticides
Regional Horticulture Research and Training Station Dr. Y. S. Parmar University, Mashobra-	University Officials, Department of Horticulture	• Rootstocks being cultivated without micro irrigation systems. • Provides inputs for safe and timely use of pesticides and nutrient management- as well as conducting research on apple mites and soil diseases.
Directorate of Horticulture, Shimla District	Officials, Directorate of Horticulture	• Though horticulture camps have been organized in the past, there is a need for Training calendar • Special provisions for hard and backward areas exist besides additional subsidy is given to farmers in scheduled areas and hilly areas under the GoI's MIDH scheme
Water User Association, Thalai village, Theog Block	Members of the association Department of Horticulture, Agriculture	• No formal training hence unaware of the full functioning requirements of WUAs. • Water supply, though inadequate to meet their needs fully, has resulted in subsistence farming giving way to a scenario of marketable surplus. • Inputs from government stores, though less reliable in quality are taken mostly to avail of existing subsidy, whereas inputs from private firms, though more expensive are better in quality. • Expect technical training related to new technology related to Horticulture and Floriculture; and WUA practices relating to roles and functioning.
Farmer consultation at Narkhanda	Farmers, Department of Horticulture,	• Concerns over hale and frost affecting yield with greater frequency of hail and more intensive in the past 10 yrs. • unclear about insurance schemes in terms of their coverage • Lower altitude orchards now required irrigation in the dry season, where previously it was not needed. • Apple mites were also identified as a recurring issue in this region; as a result many farmers were replacing apple with cherry. • wildlife conflict was also flagged as an issue
Shathla Cooperative society, Shathla	Farmers of cooperative society, Department of	• Could have a better yield if there is better access to irrigation systems. • Current reliance is on chemical agents for fertilizers, though farmers would prefer to use biological fertilizer.

Stakeholders	Participants	Key issues discussed
	Horticulture,	• farmers are practicing mulching and zero tillage; though soil moisture balance is low in the dry season • Cooperative was planning to construct a CA/CS store as the risk of selling below market price to avoid spoilage of the crop is very high.
HPMC CA, Grading sorting and packing facility- Jarol Tikkar, Kotgarh	HPMC staff, Department of Horticulture,	• About 150-200 Labourers are sourced in the season (2-3) months, most of which are male though women are engaged packing, grading too • About 1000L/day of water is used in the process of washing. No chlorination or chemical agent was added to the water. It is disposed without treatment or filtration into the nearest nullah. • Solid waste disposal was seen as minimal- Packing material included plastic crates for storage and transport. • No fungicide or chemical agent is added to the packaged apples. However a waxing process is used to preserve apples and retain moisture content. • No information was provided on H&S standards • Technical Training related to Sorting, grading, packaging is expected
Ikant wadi – Matiana	Farmers, Department of Horticulture,	• Department provides technical knowledge on best practices and new technology, varieties in the market. • Pesticides are procured from Bayer and horticulture department provides inputs to its application and storage. The CSC processed about 30,000 boxes/year
Government Department Consultation -Agriculture Department, Kullu	Officials from Department of Horticulture and Agriculture	• Constraints experienced are water resource, Proper Irrigation system, Technical Knowledge among the farmers is less, duplication of Pesticides, marketing of Apple and Other fruits and cold Storage • Anticipate increase the productivity, quality of the Apple should be better and market access should improve
Public Consultation –Jia Village-Bhunter	Farmers, Department of Horticulture, women	• issues faced include marketing of Apple and Other fruits, cold storage • Women participation is less in the area • Involvement of the gram sabha is necessary for issues relating to project interventions • Road accessibility is a major constraint to gaining exposure • Communication issue between Government Department and farmers is inadequate
Fruit Grower Association, Patlikuhl	Farmers, women, Department of horticulture	• Growers' involvement in project design is important • Communication is major issue between government department and farmers • anticipated benefit include increase the productivity, improvement in quality of fruits, market access, increase the Income of farmers • Expect support on Technical training related to New technology related to Horticulture, Pesticide and its uses; • Soil testing should be conducting regularly, training related to Marketing Management • Visual/Video presentation regarding the new technology of horticulture; Field training should be organized and also set up Demo plots for new verities • Vermi composting should be promoted, • Training for women related to Horticulture technology

Stakeholders	Participants	Key issues discussed
Public Meeting at Teesa block, Chamba,	Farmers, HDO, HEO, Lead Farmers, NGO	• Support for marketing is an area of concern; though the department had been supportive in providing guidelines and technical inputs • apples were smaller in shape and less vibrant in color due to inappropriate farming practices or lack of necessary training on usage of pesticides by crop cycle • 10% area has irrigation facility • nearest market is Amritsar to which all produce is taken as they lack a market place here. Further the packaging facilities are relatively low as only 10 kg boxes are packed in here at Teesa whereas the markets in Shimla. There is no mechanized packing system here.
Meeting with Block Development Officer, Teesa, Chamba district	Block development officer, Department of Horticulture	• Jasoragarh, Chilli, Choli, Deola, Kajjur and Gujjar are the main tribal clusters. Accessibility is the main issue in the area, therefore exposure is very limited. • orchards in the area are senile and at the stage of re-plantation • provision of ropeway, etc. to overcome accessibility constraints can be considered
Meeting with Churaha Valley Alternative Agro and Horticulture Development, Marketing Cooperative Society, Teesa, Chamba district	Officials of society, Department of Horticulture,	• has 1023 members of which 70% are Tribals. • is involved in import of rootstocks, and their sale to farmers. Members of their society sell about 50% to 60% of their produce collectively. Recently they have taken up land for cultivation within their own society on lease at rate of Rs. 25000/ per bigha/year.
Meeting with Tribal Women SHG (with Jagori - NGO), Dogali, Choli Panchayat	Representative of NGO, Tribal women farmers	• women are also involve in agriculture activities right from preparation of land and harvest including seedling, application of fertilizers, sowing, ploughing, sowing, spraying, though sale of produce is exclusively undertaken by men who deal with the contractors or agents. • Few ladies in the village also have landholding of their own. • Most of the land is rain-fed with less than 10% of their land is irrigated. • Currently only subsistence agriculture is practiced and they consume whatever is produced. • some of the households are involved in beekeeping • Training on Mushrooms, onions, Beekeeping, Vermi-composting is expected

Key consultations in respect of their implications by component for ESMF are summarized below:

Table 27 Component wise implications of consultations

Components	Summary
A: Horticulture Production and Diversification	• Quality planting material and technical knowledge of pesticides is key requirement as their current experience of inputs procured from government is not satisfactory • Irrigation infrastructure is a major need for which farmers are willing to support project interventions in terms of provision of land as necessary • Training and capacity building is a major requirement of farmers, entrepreneurs • Subsidies exist on different schemes in agriculture and horticulture thereby enabling convergence with project interventions • Expect technical training related to new technology related to Horticulture and Floriculture; and WUA practices relating to roles and functioning • need protection from hail storms and expect better insurance coverage • women groups are keen to cultivate mushrooms and other vegetables such as onions and also other trainings on beekeeping, etc.
B: Value Addition and Agri-enterprise Development	• Involvement of women in post harvest can be expected to increase in new or upgraded HPMC sites • cold storage are major needs for which farmers are willing to support project interventions in terms of provision of land as necessary • are keen to have better market access • Need training on E&S issues • Want better connectivity
C: Market Development and Sector Stewardship	Farmers are keen to have market yards closer to produce rather than individual carry goods to distant markets
D: Project Management, Monitoring and Learning	Are keen for more crop management practices and expect departments to provide necessary support in terms of farm inputs and knowledge, training, exposure visits

5.0 ANTICIPATED IMPACTS/RISKS AND MITIGATION STRATEGY

5.1 Summary of Project Interventions

The project under this its components and sub-components undertake the following activities all across the twelve districts of the state. Table 28 Summary of Project interventions presents the cumulative figures of each intervention (Refer to Annex VII for location wise details of project interventions)

Table 28 Summary of Project interventions

Project Interventions	Unit	Total (unit)
Apple	**Ha**	
Area Expansion	**Ha**	7000
Rejuvenation	**Ha**	8800
Replantation	**Ha**	3000
Other Fruits	**Ha**	
Area Expansion	**Ha**	11200
Total	**Ha**	30000
PCDOs	**No.**	
Apple	**No.**	16
Other Fruits	**No.**	20
Bee keeping		As provided under the adaptive research component
Agri-Processing Centres	**No.**	3
Market Yards	**No.**	
Existing		12
Greenfield (Nos)		2
Total		14
Pack houses	**No.**	
Existing	**No.**	5
Greenfield (Nos)	**No.**	15
Total	**No.**	20
FPOs	**No.**	27
CSCs	**No.**	27
CA	**No.**	
Existing		6
Greenfield (Nos)		2

Source: Project Implementation Plan, HPHDP

The table below presents the project interventions proposed under each component and sub-component, likely stakeholders and anticipated or intended outcomes.

Table 29 Summary of Interventions, potential stakeholders and anticipated outcomes

Component wise Interventions	Stakeholders	Anticipated outcomes
Component A: Horticulture Production and Diversification		
A1. Enhancing availability and adoption of elite planting materials and horticulture technology transfers • importing true-to-type, disease-free genetic material • standardize and certify planting materials by implementation of a system of inspection and certification; • training and capacity building of private sector (small scale) nurseries, organizing them into a nursery grower association • Support the newly established SPV for modern nursery production. • strengthen post-quarantine facilities and pest and disease surveillance; • establishing nurseries • training and capacity building, • international technical assistance to SPV, • collaboration with international nurseries/research institutions • adoptive research and development and dissemination of improved technologies (including: package of practices)	Fruit growers (including women), Nursery operators, , orchard owners, University of Horticulture and Forestry Private sector nurseries SPV for PCDOs	• enhance availability of disease-free genetic material (both root stock and cultivars); • strengthen post-quarantine facilities and pest and disease surveillance • nurseries using modern techniques for propagation • improve capacity vide training and capacity building, including study tours, workshops, vocational and academic training, preparation of technical advice modules, etc.; • enhanced awareness of improved technologies
A2. Promoting Climate Resilient Technologies and Adoption • area expansion under new orchards • replanting old, senile and unproductive apple orchards by developing soil fumigation systems • scientific orchard management practices in existing orchards by modernising farm management practices, including, new planting systems and structures, canopy management and pruning, integrated pest, disease andnutrient management	Apple and other fruit Growers, fumigators, Orchard Owners, Vegetable growers, small and marginal farmers, tribals, women WUA HEO, HDOs, SMS Farmer Interest Groups	• increased area, rejuvenated or replanted under apple orchards • improved knowledge on modern farm management including, planting systems and structures, canopy management and pruning, etc. • improved integrated pest, disease andnutrient management systems, fertiliser and irrigation management. • improved irrigation systems and enhanced water availability for cropping/farming for longer

Component wise Interventions	Stakeholders	Anticipated outcomes
systems, fertiliser and irrigation management. • develop minor community irrigation systems for storage, distribution and delivery of water • on-farm integrated crop management • post-harvest management demonstrations involving farm level cleaning, grading, packing and value addition • establish Centres of Excellence	Service Providers Pollinators	duration/periods and improved on farm water efficiency • formation and training of WUAs • awareness regarding and improved post-harvest management practices • model centres for knowledge and experience sharing for future interventions • Increase in availability of quantity of water for irrigation • Improvement in quality of water for drinking • Increase in soil moisture retention period for longer duration.
A3. Facilitation of access to financial services and building financial capability • Ensure access to long term credit • Development of new products to farmers • development of key fact statements for new products • development of mobile based communications • financial counseling to farmers	Apple and other fruit Growers, , Banks/financial institutions, Orchard Owners, vegetable growers including, small and marginal farmers, tribals, women, HEO, HDOs, SMS	• improved access to long term credit • new products and improved awareness amongst farmers • knowledge on products and awareness amongst farmers regarding uses of financial products to purchase elite planting material, farm inputs, anti-hail nets, pruning, insurance, improve savings and investments
Component B: Value Addition and Agri-enterprise Development		
B1 Product aggregation and sale through producer associations • to organize the producers into farmer producer organizations; develop their capacity and skills • investment support to these FPOs for establishing common service centres (CSCs). • Establishment of about 27 common service centres would be supported by the project, primarily focusing on vegetables, fruits, and cut flowers. • bulk purchase of inputs for sale to individual members, marketing of produce, grading and quality control, and enhancing access to distant and higher value markets	Fruit, Vegetable and Flower growers (including women, tribals), Self Help Groups, Common service Centres, Farmers producers organizations, Service provider, Transport operators	• improved shelf life for produce • higher prices for saleable produce • reduction or savings in transaction costs • Farmers' knowledge of markets and capacities to negotiate in the market will be enhanced • improved primary and local level grading and processing facilities • Formation of FPOs will lead to an increase in farmers' bargaining capacity and help in collective procurement of quality products • FPO adopts measures for IPM and production of vermicomposting thereby reducing reliance on agrochemicals.
B2 Supply Chain Infrastructure Support and piloting	Fruit, Vegetable and Flower	• Improve the capacity of the growers to utilize markets to

Component wise Interventions	Stakeholders	Anticipated outcomes
Negotiable Warehouse Receipts: • Renovation, expansion or modernization or green-fleld cold chain infrastructure such as pack-houses, controlled atmosphere storage (CAs) • negotiable warehouse receipts to provide post harvest finance against stored goods	growers (including women, tribals), Self Help Groups, Common service Centres, Farmers producers organizations, Service provider, Transport operators	their financial advantages • provide post-harvest finance against the stored goods and facilitate NWR based trading. • reduce the seasonal gluts of produce and thereby distress sale of produce by farmers and ensuring better incomes • extend the marketing period by withdrawing some supplies from the fresh spot market and storing them for off-season marketing.
B3. Agri-Business Promotion Facility (ABPF) • promote private investment in local horticulture agribusiness, fosterbackward and forward linkages promote positive policy change; • provide agribusiness incubation services; • facilitating access to financing for agribusiness enterprises.	Fruit, Vegetable and Flower growers/entreprenuers, Banks, financial institutions, Self Help Groups, Common service Centres, Farmers producers organizations,	• generate and support entrepreneurs • improve access for such enterprises • help scale up existing and new enterprises
Component C: Market Development and Sector Stewardship		
C1. Upgradation and modernization of agricultural wholesale markets • upgrade, modernize wholesale markets/market yards • provide basic infrastructure to such yards such as auction hall, internal roads, toilets, parking, price display board, loading platform, ramps, fence	Fruit, Vegetable and Flower growers (including women, tribals), Self Help Groups, Common service Centres, Farmers producers organizations, Service provider, Transport operators, Dept of Horticulture, HPMC, APMC staff	• automation of business transactions leading to transparency in market information and intelligence to the farmers. • Availability of market yards closer to produce rather than chandigarh, amristar, delhi • improving access to distant buyers
C2: Setting up Economic and Market Information and Intelligence (EMI) cell • set up of an EMI cell • support diversification and intensification of horticultural production, aimed at responding to market demand and climate variability.	Fruit, Vegetable and Flower growers (including women, tribals), Common service Centres, Farmers producers organizations, Service provider, Transport operators, Dept of Horticulture, HPMC, APMC, staff, IT Service provider	• increase information transparency, productivity, profitability and market access to farmers, producers • creation of a body of commercial and market knowledge on horticulture marketing and production,
Component D: Project Management, Monitoring and Learning		
• establish Project Coordination Unit,	Project implementation staff,	• effectively implement, monitor the interventions and

Component wise Interventions	Stakeholders	Anticipated outcomes
• establishment and operations of Project Implementation Units in the respective implementing agencies; • set up of a monitoring and evaluation (M&E) • contract an external M&E agency to monitor project activities and impact	NGOs/service provider, M&E agency	thereby successfully implement the project

Source: Project Appraisal Document, HPHDP, The World Bank, 2015

5.2 Interventions by Impacts, risks and suggested mitigation measures

Table 30 presents summary of interventions, likely impacts, likely risks in achieving the intended outcomes and also lists the potential mitigation measures

Table 30 Summary of Interventions, impacts, risks and potential mitigation measures

Summary of Interventions, impacts, risks and potential mitigation measures			
Component wise Interventions	**Impacts**	**Risks**	**potential mitigation measures**
Component A: Horticulture Production and Diversification			
A1. Enhancing availability and adoption of elite planting materials and horticulture technology transfers • importing true-to-type, disease-free genetic material • strengthen post-quarantine facilities and pest and disease surveillance; • establishing nurseries • training and capacity building, • international technical assistance to SPV, • collaboration with international nurseries/research institutions • adoptive research and development and dissemination of improved technologies • Demonstrations for integrated crop management and post harvest management	• Sites for nurseries if existing land is inadequate and new sites are required	• small and marginal farmers, women and tribals may be excluded from training and capacity building activities • A pest or disease outbreak in the stoolbed or nursery, particularly if it related to a quarantine organism, could result in loss of a substantial amount of plant material, and potentially delay achievement of targets • Release of diseased material from nurseries to orchards which would have a detrimental effect on area expansion and the long term	• Existing and identified sites would require screening to ascertain if there are any adverse impacts and if so, avoid the site • inclusion criteria to be followed in selection of such farmers to be incorporated in the Community Operations Manual • project functionaries to be provided due training to ensure inclusion • Strict monitoring protocols will be imposed to prevent major outbreaks occurring. • Nurseries will be established at different sites so that an

Summary of Interventions, impacts, risks and potential mitigation measures			
Component wise Interventions	**Impacts**	**Risks**	**potential mitigation measures**
		health and viability of the crop.	outbreak will not threaten the entire production. • Plant imports shall be restricted to the first 3 years of the programme. A measured approach to area expansion using material produced from locally propagated trees will aid this. Rapid establishment of nurseries, and focus on rapid multiplication in the early years will minimise the quarantine risks from imported material. • The project will also seek international advice on best practice hygiene and Pest and Disease monitoring. • Imported plants will be inspected by a designated inspection authority (DIA), to ensure that no new pests or diseases are imported into the country. Plants detected with new pests or diseases will be destroyed and containment measures put in place. The Dr. YS Parmar University of Horticulture & Forestry, Nauni, Solan (HP) is currently the registered DIA for carrying out these inspections.
A2. Promoting Climate Resilient Technologies and Adoption • area expansion under new orchards • replanting old, senile and unproductive	• land requirement for siting of irrigation facilities and centres of Excellence	• small and marginal farmers, women and tribals may be required to give up land for siting irrigation	• land for Centres of Excellence already with implementing agencies and further screening would be undertaken to assess if

Summary of Interventions, impacts, risks and potential mitigation measures			
Component wise Interventions	**Impacts**	**Risks**	**potential mitigation measures**
apple orchards by developing soil fumigation systems • scientific orchard management practices or rejuvenation in existing orchards by modernising farm management practices, including, new planting systems and structures, canopy management and pruning, integrated pest, disease andnutrient management systems, fertiliser and irrigation management. • develop minor community irrigation systems for storage, distribution and delivery of water • on-farm integrated crop management • post harvest management involving farm level cleaning, grading, packing and value addition • establish Centres of Excellence	• Improper disposal of construction debris could block natural water courses and impact downstream beneficiaries. • Possibility of pollutionof groundwatersources due to excessive use of fertilizers and pesticide • Increase use of pesticides and other agrochemicals • Downstream flow is impacteddue to the construction of various irrigation schemes.	• such farmers might not get water supply as promised/inequitable distribution of water • may not understand requirements of roles in a WUA • may not be able to benefit from postharvest management • may be excluded training and capacity building regarding modern farm practices • Risk of obstructing natural course of flow of water leading to negative impact on ground water recharging and impacting already existing minor irrigation systems • Increase in the use of pesticides and other agrochemicals with potential downstream impacts on human health and pollution of sub-surface water, aquatic and soil ecosystems. • Some non-adopter farmers could start using pesticides once irrigation water is available and crop diversification is be adopted • Risk of procurement of banned pesticides and non-availability of commonly used pesticides	there are any adverse impacts • land requirement would be included in the agreement between project and the WUA • fair and transparent approach in siting of irrigation infrastructure based on land holdings of each beneficiary farmer • developing criteria in selection of farmers for expansion, replantation and rejuvenation and its effective communication to farmers • project functionaries to counsel farmers on WUA, Postharvest management benefits • Encourage farmers to opt for special measures like drip irrigation systems, crop management practices • Train farmers on IPM and discourage use of chemical pesticides; provide relevant training in storing, handling, applying and disposing fertilizers and pesticides. • Apply the Pest Management Plan IPM strategy • Circulation of banned list of pesticides and insecticides as well as guidelines for pesticide management to be shared from national to watershed/ user group level

Summary of Interventions, impacts, risks and potential mitigation measures			
Component wise Interventions	**Impacts**	**Risks**	**potential mitigation measures**
		• Increased incidence of pest if the same crop is promoted repeatedly • Unplanned use of bio-control measures by employing bio-agents that have not been tested fully, especially when Economic Threshold Limits (ETL) are not well worked out • Lack of trained human resources to train large farmer base using pesticides • No plan for post project sustainability may lead to lack of ownership, operation and maintenance for the water harvesting structures. • Felling of trees for creating village level CSC or Village ponds • Availability of water and imported cultivars may lead to unsustainable use of available water • Individual users may not agree to use water as per the plan • Failures in check dams • Siltation in water harvesting structures • Cholorpicrin is toxic to mamals and birds, and there is a risk it may contaminate water source if handlers are not trained.	• Identify special target groups, e.g. horticulture officers for training in procuring and applying IPM packages for select crops. • Awareness programs on using pesticides, exposure trips, demonstration plots/ research stations and annual refresher training workshops for a range of stakeholders • Emphasize convergence with relevant departments for providing access to biopesticides • Standard environmental soil and water conservation, soil health management agriculture and horticulture measures to be applied, • Avoid major WHS near habitation • Adoption of IPM as a pest management strategy whilst developing a package of practices is a key mitigation measure to ensure that use of chemical pesticides does not increase substantially due HPHDP project activities. • Spurs and other stream bank protection should not cause drainage congestion • Cholorpicrin only through drip (trickle) irrigation systems and

Summary of Interventions, impacts, risks and potential mitigation measures			
Component wise Interventions	**Impacts**	**Risks**	**potential mitigation measures**
			not through any other type of irrigation system. • EGs for soil and water conservation, water harvesting structures, and soil nutrient management have been developed for design and operational phase.
A3. Facilitation of access to financial services and building financial capability • Ensure access to long term credit • Development of new products to farmers • development of key fact statements for new products • development of mobile based communications • financial counseling to farmers	• none	• such farmers might not comprehend requirements, new products, mobile based communications and thereby access credit • may not understand requirements of roles in a WUA • Introduction of new pollinatorswithout prior assessment of possible negative impacts of the pollinators on native ecosystems • Climate change may be a further threat to pollination services	• Ensure all farmers (including those needing special assistance - women, tribals with lower levels of exposure) are provided with adequate training, handholding support, guidance as necessary to understand and comprehend offered features and services. to be done through ICT strategy and Citizen engagement strategy • Promote policies that support pollination-friendly actions such as land use planning and, as applicable, responsible use of pesticides. • Build capacity for sustainably managing pollinators. • Giving consideration to the season long resources needed by pollinators, both before and after crop flowering • Ensuring connectivity of natural habitats in farming areas, so that pollinators can more easily disperse and make needed shifts

Summary of Interventions, impacts, risks and potential mitigation measures			
Component wise Interventions	**Impacts**	**Risks**	**potential mitigation measures**
			in response to changing climates.
Component B: Value Addition and Agri-enterprise Development			
B1 Product aggregation and sale through producer associations • to organize the producers into farmer producer organizations; develop their capacity and skills • investment support to these FPOs for establishing common service centres (CSCs). • Establishment of about 27 common service centres would be supported by the project, primarily focusing on vegetables, fruits, and cut flowers. • bulk purchase of inputs for sale to individual members, marketing of produce, grading and quality control, and enhancing access to distant and higher value markets	• Existing government land may have potential minor impacts • Grey water disposal after washing the fruits and vegetables • Disposal of packing material, especially non-bio degradable. • Increase in solid waste due to packaging material • Top soil removal during the construction of various infrastructure	• Small and marginal farmers, women and tribals may be required to give up land for siting of CSC groups formed may be weak/ in cohesive • Such farmers may not understand requirements of roles in a FIGs/FPOs and may be slow to develop their capacity and skills • Their interests may be subsumed/ignored and they may not benefit from collective procurement of inputs and access to markets • Felling of Trees • Improper storage of inputs (pesticide, fertilizer and organic manure) may lead to spills/leaks and lead to contamination of soil and water Poor storage of may lead to pest and disease infestation • Improper disposal of waste can damage land and create pollution • Rotting organic waste could be health hazard • FPO promoting use of agrichemicals	• land for CSCs would be either taken from Panchayat land or individual land or on lease in case of investor outside of the state. Further screening would be undertaken to assess if there are any adverse impacts • Engaging community mobilzers effectively to ensure cohesive group formation and functioning • Ensure all farmers (including those needing special assistance - women, tribals with lower levels of exposure) are provided with adequate training, handholding support develop criteria, establish quorum for meetings in the COM so as to ensure every farmer's voice is heard, • Provide enough space for vermicomposting using bio-degradable waste Involving local SHGsto take this as a micro enterprise will provide additional revenues and gainful employment. • EnvironmentalGuidelines for FPO operation have been developed

Summary of Interventions, impacts, risks and potential mitigation measures			
Component wise Interventions	**Impacts**	**Risks**	**potential mitigation measures**
		• improper construction of CSC	
B2 Supply Chain Infrastructure Support and piloting Negotiable Warehouse Receipts: • Renovation, expansion or modernization or green-fleld cold chain infrastructure such as pack-houses, controlled atmosphere storage (CAs) • negotiable warehouse receipts to provide post harvest finance against stored goods	• Existing government land for CAs and packhousesmay have potential for minor impacts • Improper disposal of construction debris • Dust, noise production • Solid and liquid waste disposal in construction and operational phase	• Small and marginal farmers, women and tribals may be required to give up land for siting of packhouses • Such farmers may not understand the provisions to keep one-fourth of the space for their produce • Bigger farmer may usurp space made available in CAs may be reluctant and therefore not avail of finance against stored goods • Inadequate management of environmental issues during the construction phase of infrastructure • Dumping of bio degradable wastes in non-designated area could pollute land and water resources	• Land requirement would be fulfilled by existing land of HPMC /Horticulture. Further screening would be undertaken to assess if there are any adverse impacts • Educating farmers to overcome reluctance to store produce • Facilitate these transition time and build confidence by facilitating constant interaction between banks and farmers • All the infrastructure would be created after preparation of a separate EIA, EMP wherein the provisions for mitigation and compliance would be clearly mentioned.
B3. Agri-Business Promotion Facility (ABPF) • promote private investment in local horticulture agribusiness, foster backward and forward linkages promote positive policy change; • provide agribusiness incubation services; • facilitating access to financing for agribusiness enterprises.	• None	• Small and marginal farmers having desire to scale up may not fully understand services offered and may stay away	• Develop simple and easy to understand messages and information brochures for effective communication
Component C: Market Development and Sector Stewardship			
C1. Upgradation and modernization of agricultural wholesale markets	• Land for siting new market yards or for	• Small and marginal farmers, women and tribals may be	• APMC land with clear titles would be ensured. Further

Summary of Interventions, impacts, risks and potential mitigation measures			
Component wise Interventions	**Impacts**	**Risks**	**potential mitigation measures**
• upgrade, modernize wholesale markets/market yards • provide basic infrastructure to such yards such as auction hall, internal roads, toilets, parking, price display board, loading platform, ramps, fence	expansion of old ones may have potential for minor impactsWith upgraded capacity of facilities for grading sorting, packing and processing the biodegradable waste generated is likely to increase • Negative impact of construction activities, debris disposal approach roads etc on agriculture land or water bodies	required to give up land for siting of packhouses • Small and marginal farmers particularly tribals in hard and backward areas may be unable to reach these market yards • Drainage facilities in theAPMCs release the drainwater to the municipal sewage system without any treatment. • Inadequate area for parking, loading etc • Encroachment on forestland	screening would be undertaken to assess if there are any adverse impacts • Provision of market access or other access means (such as ropeways or transportation means) as decided based on FPICs • Ensure proper drainage system and set up primary treatment facility in market yards before letting out wastewater • Follow guidelines on wastedisposal – both for organic andinorganic waste. • In market yards close tofarmlands, use bio-degradable waste for vermi-composting • Appoint waste handling agencies whocollect the waste takeit to designated waste managementfacilities. • Do not develop site on agricultural farms, dry river/stream beds-instead identify wasteland, as far as possible, for constructing markets • Site should be suitable for construction activity, with proper drainage, space for traffic movement
C2: Setting up Economic and Market Information and Intelligence (EMI) cell • set up of an EMI cell	• none	• Small and marginal farmers, women and tribals may be reluctant due to lack of prior	• Continued handholding and focused communication aimed to enable effective decision

Summary of Interventions, impacts, risks and potential mitigation measures			
Component wise Interventions	**Impacts**	**Risks**	**potential mitigation measures**
• support diversification and intensification of horticultural production, aimed at responding to market demand and climate variability.		exposure to markets and may not respond to the new initiatives • May be slow to understand implications of market demand and climate variability • Better price realization can influence farmers to shift from staple food to High yielding crops – this can have an impact on household level food security	making would be ensured through inclusion criteria and also culturally suitable appropriate IEC material (in case of tribals) • HP HDP to document use of any traditional varieties and land races of main crops and/or other crops to preserve geneticdiversity
Component D: Project Management, Monitoring and Learning			
• establish Project Coordination Unit, • establishment and operations of Project Implementation Units in the respective implementing agencies; • set up of a monitoring and evaluation (M&E) • contract an external M&E agency to monitor project activities and impact	• none	• Lack of adequate awareness on environment and social requirements of ESMF • frequent turnover of officials leading to loss of institutional memory • issues not being due to ineffective coordination between implementing agencies • inadequate trainings -- number and quality • selection of poor quality M&E agency • Low or no prior knowledge of implementing environmental and social safeguards • M&E is largely driven by State PCU through PIU- little or no involvement of communities in sub-projects resulting in	• Commensurate periodic training on ESMF and refresher trainings as necessary • progress monitoring of PCU • rigorous monitoring of ESMF • delivering good quality training and continuous feedback to ensure improvement • careful selection of M&E agency • PCU needs to ensure streamlining ESMF in the planning stage of various interventions • Provide training at the cluster level in M&E for tracking project progress

Summary of Interventions, impacts, risks and potential mitigation measures			
Component wise Interventions	**Impacts**	**Risks**	**potential mitigation measures**
		limitation of availability of real time data	

SECTION B

ENVIRONMENT MANAGEMENT FRAMEWORK

6.0 ENVIRONMENT MANAGEMENT FRAMEWORK

6.1 Rationale and Objectives

The first objective of the EMF is to develop a generic environmental management plan and framework to address environmental issues arising during planning, design, and construction and operation phase of any upcoming project. The EMF will be used to establish criteria to identify the level of EA required for the project and the processes involved, their sequence to conduct the EA studies for various components/phases of the project. All the locations and sub-components of the project have not yet been identified and these will be identified as project implementation progresses. Further, there may be a number of other issues that might emerge during the course of the study and project preparation which will need to also be examined in the EMP. Appropriate management plans to adequately address safeguard issues would have to be developed during the project implementation. For this purpose, develop an EMF that would provide adequate guidance and management framework during the project implementation for subprojects triggering social and environmental issues.

Given the need for appropriate environmental management for the project and in the current context of the project formulation, the EMF specifically seeks to:

1. Establish clear procedures and methodologies for environmental planning, review, approval and implementation of sub-projects to be financed under the Project.
2. To provide practical guidance for planning, designing and implementing the environmental management measures.
3. Specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and related social concerns of the sub-projects and;
4. Determine the institutional arrangements, including those related to training, capacity building and technical assistance (if required) needed to successfully implement the provisions of the EMF.

6.2 Categorization of HPHDP Interventions

Based on the discussion in the preceding sections, HPHDP interventions may be categorized as having a “low-moderate” level or “moderate- high”of impact on the environment. The classification of activities in the figure is largely subjective, and may be overruled by the new site specific issues or information and detailed project activities not captured in this framework.

Provision of post-harvest infrastructure, pack houses, market yards and agro- processing and likely associated activities will involve road construction, construction installation of machinery and waste disposal are seen as having “moderate-major” impacts. These sub projects are considered for preparation of a sub project specific standalone EIA/EMP. Specific measures have been suggested in this regard where practicable.

With regard to low- moderate impacts where the project activity is not expected to cause any significant impact in such cases, best practice measures and mitigation have also been recommended where appropriate to improve the environmental and social performance of the project.

Table 31 classification of activities based on degree of environmental impact

Impact Category	Project intervention	Application of ESMF
Low- Moderate	1. Water harvesting and distribution 2. Irrigation[12] systems 3. Post entry quarantine (PEQ) and demonstration nurseries 4. Pesticides and Fertilizers- application, use and storage (follow IPM,IPNM) 5. Pest and Disease Surveillance 6. CSC at village level 7. Management of Pollinators 8. Operation of Farmer Producer Organization 9. Interventions related to climate change resilience 10. Storage & Marketing of Inputs and Produce	Application of EGs/best practices in the design and operational phase
Moderate- High	1. Agri Processing Centers 2. Pack Houses 3. Cold Storage, CA storage with sorting grading and packing facilities 4. Market Yards 5. Effluent treatment plants 6. Access Roads and connectivity	Assessed on a case to case basis for requirement of EIA/EMP.

6.3 Step wise processing of subprojects in relation to the EMF

Taking into consideration the above classification of activities/sub projects. The process flow of design, review, approval and monitoring of activities is described in the figure below.

[12] The infrastructure that would be needed for the development of minor community irrigation systems will emerge from the actual field level assessment, through participative consultation and crop water budgeting

Figure 7 Step Wise EMF Processing

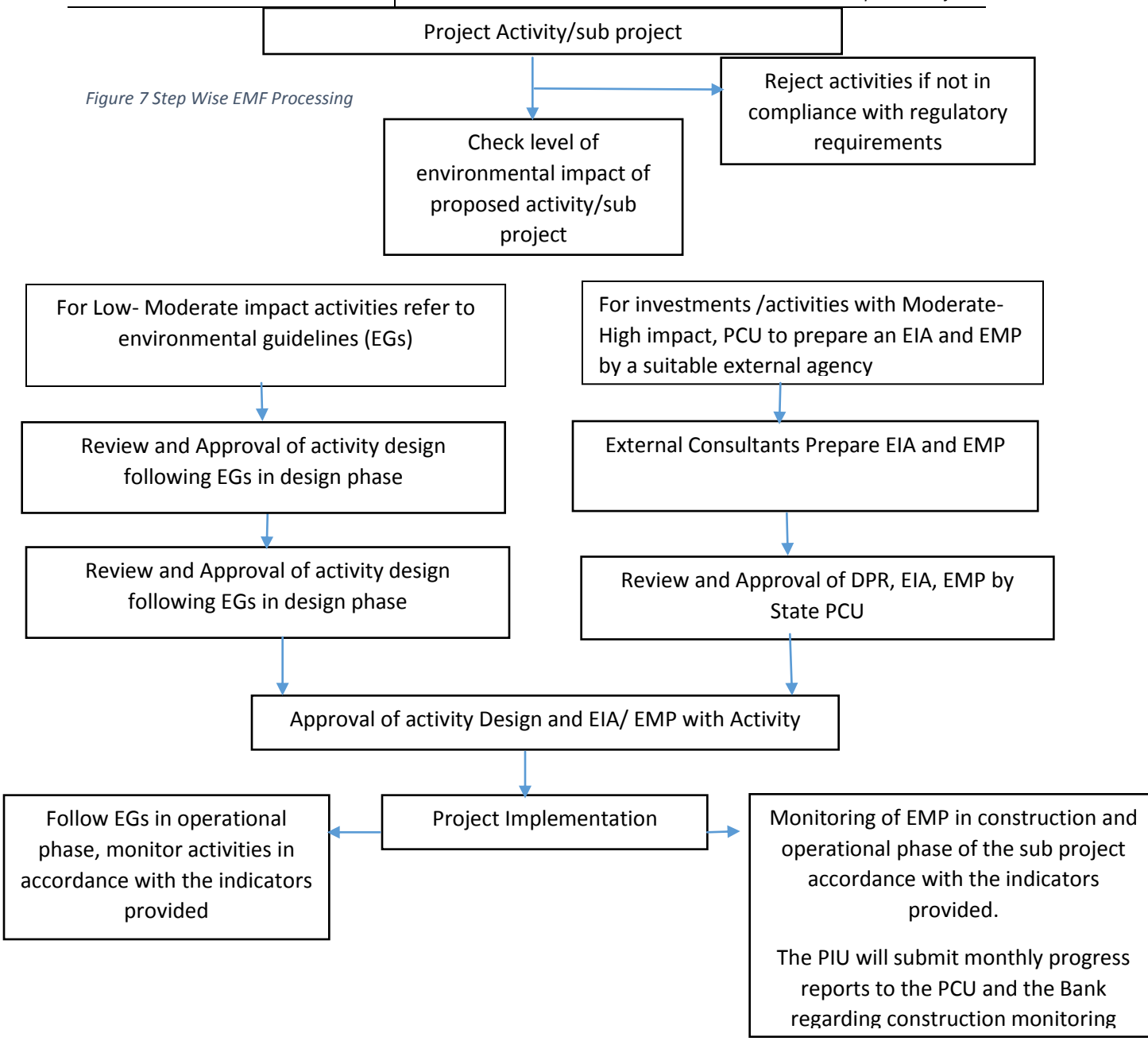


Table 32 Mapping of EMF to HPHDP components

Summary of Interventions, impacts, risks and potential mitigation measures				
Component wise Interventions	**Impacts and Risks**	**potential mitigation measures**	**Implmenting agency**	**Provisions in the EMF**
Component A: Horticulture Production and Diversification				
A1. Enhancing availability and adoption of elite planting materials and horticulture technology transfers • importing true-to-type, disease-free genetic material • strengthen post-quarantine facilities and pest and disease surveillance; • establishing nurseries • training and capacity building, • international technical assistance to SPV, • collaboration with international nurseries/research institutions • adoptive research and development and dissemination of improved technologies • Demonstrations for integrated crop management and post-harvest management	• A pest or disease outbreak in the stoolbed or nursery, particularly if it related to a quarantine organism, could result in loss of a substantial amount of plant material, and potentially delay achievement of targets • Release of diseased material from nurseries to orchards which would have a detrimental effect on area expansion and the long term health and viability of the crop.	• Strict monitoring protocols will be imposed to prevent major disease outbreaks occurring. • Nurseries will be established at different sites so that an outbreak will not threaten the entire production. • Plant imports shall be restricted to the first 3 years of the programme. A measured approach to area expansion using material produced from locally propagated trees will aid this. Rapid establishment of nurseries, and focus on rapid multiplication in the early years will minimise the quarantine risks from imported material. • The project will also seek international advice on best practice hygiene and Pest and Disease monitoring. • Imported plants will be inspected by a designated inspection authority (DIA), to ensure that no new pests or diseases are imported into the country. Plants detected with new pests or diseases will be destroyed and containment measures put in place. The Dr. YS Parmar University of Horticulture & Forestry, Nauni, Solan (HP) is currently the registered DIA for carrying out these inspections.[13]	PIU UHF A Special Purpose Vehicle (SPV), a registered body established by GoHP is responsible for the propagation of elite planting materials. International technical assistance will be provided to the SPV Nursery Production Consultants Fruit Production & Orchard Management Consultants Entomology & Plant Pathology Consultants Water Harvesting and Management Consultancy	Mitigation actions have been provided for impacts associated with the import of root socks and cultivars Post Entry Quarantine regularions and monitoring requirements will need to be followed this has been provide in Annex IV

[13] Details on Import and Post Entry Quarantine have been provided in Annex IV

Summary of Interventions, impacts, risks and potential mitigation measures				
Component wise Interventions	**Impacts and Risks**	**potential mitigation measures**	**Implmenting agency**	**Provisions in the EMF**
A2. Promoting Climate Resilient Technologies and Adoption • area expansion under new orchards • replanting old, senile and unproductive apple orchards by developing soil fumigation systems • scientific orchard management practices or rejuvenation in existing orchards by modernising farm management practices, including, new planting systems and structures, canopy management and pruning, integrated pest, disease andnutrient management systems, fertiliser and irrigation management. • develop minor community irrigation systems for storage, distribution and delivery of water • on-farm integrated crop management • Demonstrations for post harvest management involving farm level cleaning, grading, packing and value addition • establish Centres of Excellence	• Improper disposal of construction debris from WHS could block natural water courses and impact downstream beneficiaries. • Possibility of pollution of groundwater sources due to excessive use of fertilizers and pesticide • Increase use of pesticides and other agrochemicals • Downstream flow is impacted due to the construction of various irrigation schemes. • Risk of obstructing natural course of flow of water leading to negative impact on ground water recharging and impacting already existing minor irrigation systems • Increase in the use of pesticides and other agrochemicals with potential downstream impacts on human health and pollution of sub-surface water, aquatic and soil ecosystems. • Some non-adopter farmers could start using pesticides once irrigation water is available and crop diversification is be adopted • Risk of procurement of banned pesticides and non-availability of commonly used pesticides • Increased incidence of pest if the same crop is promoted repeatedly • Unplanned use of bio-control measures by employing bio-agents that have not been	• Encourage farmers to opt for special measures like drip irrigation systems, for on farm micro irrigation • Train farmers on IPM and discourage use of chemical pesticides; provide relevant training in storing, handling, applying and disposing fertilizers and pesticides. • Apply the Pest Management Plan IPM strategy • Circulation of banned list of pesticides and insecticides as well as guidelines for pesticide management to be shared from national to watershed/ user group level • Identify special target groups, e.g. horticulture officers for training in procuring and applying IPM packages for select crops. • Awareness programs on using pesticides, exposure trips, demonstration plots/ research stations and annual refresher training workshops for a range of stakeholders • Emphasize convergence with relevant departments for providing access to bio pesticides • Standard environmental soil and water conservation, soil health management agriculture and horticulture measures to be applied, • Avoid major WHS near habitation • Spurs and other stream bank protection should not cause	PIU Horticulture The project will finance the extended presence of a technical assistance consultant firm which will assist with the planning and management of implementation of these investments NGOs / field facilitators capable of supporting cluster level community mobilization, irrigation system management, on-farm water management, and formation of farmer groups and producer organizations •	Environmental Guidelines have been provided for the following parameters, these will be applicable while designing and operating interventions in component A2 • soil and water conservation • water harvesting structures • water use • soil nutrient management • Agriculture and Horticuluture A separate intergrated pest management plan has been prepared for the project

Summary of Interventions, impacts, risks and potential mitigation measures				
Component wise Interventions	**Impacts and Risks**	**potential mitigation measures**	**Implmenting agency**	**Provisions in the EMF**
	tested fully, especially when Economic Threshold Limits (ETL) are not well worked out • Lack of trained human resources to train large farmer base using pesticides • No plan for post project sustainability may lead to lack of ownership, operation and maintenance for the water harvesting structures. • Felling of trees for creating village level CSC or Village ponds • Availability of water and imported cultivars may lead to unsustainable use of available water • Individual users may not agree to use water as per the plan • Failures in check dams • Siltation in water harvesting structures • Cholorpicrin could contaminate nearby water sources if not under correct supervision and training. There is also a risk of contamination while disposing of equipment washwaters or rinsate.	drainage congestion • Adoption of IPM as a pest management strategy whilst developing a package of practices is a key mitigation measure to ensure that use of chemical pesticides does not increase substantially due HPHDP project activities. • Cholorpicrin only through drip (trickle) irrigation systems and not through any other type of irrigation system.[14]		
A3. Facilitation of access to financial services and building financial capability • Ensure access to long term credit • Development of new products to farmers • development of key fact	• Introduction of new pollinatorswithout prior assessment of possible negative impacts of the pollinators on native ecosystems • Climate change may be a	• Promote activities that support pollination-friendly actions such as land use planning and, as applicable, responsible use of pesticides. • Build capacity for sustainably managing pollinators. • Giving consideration to the	• PIU Horticulture	•

[14]For more details about Choloricprin applications refer to Annex V

Summary of Interventions, impacts, risks and potential mitigation measures				
Component wise Interventions	**Impacts and Risks**	**potential mitigation measures**	**Implmenting agency**	**Provisions in the EMF**
statements for new products • development of mobile based communications • financial counseling to farmers	further threat to pollination services •	season long resources needed by pollinators, both before and after crop flowering • Ensuring connectivity of natural habitats in farming areas, so that pollinators can more easily disperse and make needed shifts in response to changing climates.		
	Component B: Value Addition and Agri-enterprise Development			
B1 Product aggregation and sale through producer associations • to organize the producers into farmer producer organizations; develop their capacity and skills • Investment support to these FPOs for establishing common service centres (CSCs). • Establishment of about 27 common service centres would be supported by the project, primarily focusing on vegetables, fruits, and cut flowers. • bulk purchase of inputs for sale to individual members, marketing of produce, grading and quality control, and enhancing access to distant and higher value markets	• Improper storage of inputs (pesticide, fertilizer and organic manure) may lead to spills/leaks and lead to contamination of soil and water Poor storage of may lead to pest and disease infestation • Improper disposal of waste can damage land and create pollution • Rotting organic waste could be health hazard • FPO promoting use of agrichemicals • Grey water disposal after washing the fruits and vegetables • Disposal of packing material, especially non-bio degradable. • Increase in solid waste due to packaging material Top soil removal during the construction of various infrastructure	• Provide enough space for vermicomposting using bio-degradable waste Involving local SHGs to take this as a micro enterprise will provide additional revenues and gainful employment.	PIU Horticulture Three private Service Providers will be contracted by PCU to mobilize producer groups, and establish FPOs across 27 possible geographic areas in HP. They will be hired for four years to establish FPOs and guide each FPO through to registration.	Environmental Guidelines have been developed for the following • FPO operation • H&S of operational faciltities
B2 Supply Chain Infrastructure Support and piloting Negotiable Warehouse Receipts: • Renovation, expansion or modernization or green-fleld cold chain infrastructure such as pack-houses, controlled atmosphere storage (CAs)	• small and marginal farmers, women and tribals may be required to give up land for siting of pack houses • such farmers may not understand the provisions to keep one-fourth of the space for their produce	• land requirement would be fulfilled by existing land of HPMC /Horticulture. Further screening would be undertaken to assess if there are any adverse impacts • educating farmers to overcome reluctance to store produce	PIU HPMC A lead international consultant and an assistant will be responsible for assessing current infrastructure at each HPMC pack-house and CA stores selected for expansion. These consultants will identify and design	Provision for EIA/EMP preparation, implementation and monitoring Environmental Guidelines have been developed for H&S of operational faciltities

Summary of Interventions, impacts, risks and potential mitigation measures				
Component wise Interventions	**Impacts and Risks**	**potential mitigation measures**	**Implmenting agency**	**Provisions in the EMF**
• negotiable warehouse receipts to provide post harvest finance against stored goods	• bigger farmer may usurp space made available in CAs • may be reluctant and therefore not avail of finance against stored goods • Inadequate management of environmental issues during the construction phase of infrastructure • Improper disposal of construction debris • Dust, noise production • solid and liquid waste disposal in construction and operational phase • Dumping of bio degradable wastes in non-designated area could pollute land and water resources	• facilitate these transition time and build confidence by facilitating constant interaction between banks and farmers • All the infrastructure would be created after preparation of a separate EIA, EMP wherein the provisions for mitigation and compliance would be clearly mentioned.	the most appropriate installations for each of the six existing sites. An International Consultant will be hired to scope the installation of new equipment into the two existing HPMC processing plants and any Greenfield investments that occur later in the project.	
B3. Agri-Business Promotion Facility (ABPF) • promote private investment in local horticulture agribusiness, foster backward and forward linkages promote positive policy change; • provide agribusiness incubation services; • facilitating access to financing for agribusiness enterprises.	• small and marginal farmers having desire to scale up may not fully understand services offered and may stay away	• Develop simple and easy to understand messages and information brochures for effective communication	• PCU	•
	Component C: Market Development and Sector Stewardship			
C1. Upgradation and modernization of agricultural wholesale markets • upgrade, modernize wholesale markets/market yards • provide basic infrastructure to such yards such as auction hall, internal roads, toilets, parking, price display board, loading platform, ramps, fence	• Drainage facilities in the APMCs release the drain water to the municipal sewage system without any treatment. • Inadequate area for parking, loading etc • Encroachment on Forestland • With upgraded capacity of facilities for grading sorting, packing and processing the biodegradable waste	• APMC land with clear titles would be ensured. Further screening would be undertaken to assess if there are any adverse impacts • provision of market access or other access means (such as ropeways or transportation means) as decided based on FPICs • ensure proper drainage system and set up primary treatment facility in market yards before	PIU HPSAMB HPSAMB would recruit, a design and engineering service provider for working with selected markets for the development of market upgradation proposal. Project would also support the recruitment of additional engineers in HPSAMB to assist the implementation of this sub component. The project will also recruit	Provision for EIA/EMP preparation, implementation and monitoring Environmental Guidelines have been developed for H&S of operational faciltities •

Summary of Interventions, impacts, risks and potential mitigation measures				
Component wise Interventions	**Impacts and Risks**	**potential mitigation measures**	**Implmenting agency**	**Provisions in the EMF**
	generated is likely to increase • Negative impact of construction activities, debris disposal approach roads etc on agriculture land or water bodies	letting out wastewater • Follow guidelines on waste disposal – both for organic and inorganic waste. • In market yards close to farmlands, use bio-degradable waste for vermi-composting • Appoint waste handling agencies who collect the waste take it to designated waste management facilities. • Do not develop site on agricultural farms, dry river/stream beds-instead identify wasteland, as far as possible, for constructing markets • Site should be suitable for construction activity, with proper drainage, space for traffic movement •	independent Market Field Engineer (MFEs) to ensure compliance with engineering design, technical specification and contract conditions.	
C2: Setting up Economic and Market Information and Intelligence (EMI) cell • set up of an EMI cell • support diversification and intensification of horticultural production, aimed at responding to market demand and climate variability.	• small and marginal farmers, women and tribals may be reluctant due to lack of prior exposure to markets and may not respond to the new initiatives • may be slow to understand implications of market demand and climate variability • Better price realization can influence farmers to shift from staple food to High yielding crops – this can have an impact on household level food security	• Continued handholding and focused communication aimed to enable effective decision making would be ensured through inclusion criteria and also culturally suitable appropriate IEC material (in case of tribals) • HP HDP to document use of any traditional varieties and land races of main crops and/or other crops to preserve genetic diversity	• PIU HPSAMB	•
	Component D: Project Management, Monitoring and Learning			
• establish Project Coordination Unit, • establishment and operations of Project Implementation Units in the respective	• Lack of adequate awareness on environment and social requirements of ESMF • frequent turnover of officials leading to loss of institutional	• Commensurate periodic training on ESMF and refresher trainings as necessary • progress monitoring of PCU • rigorous monitoring of ESMF	• HP HDP Society, PCU	•

Summary of Interventions, impacts, risks and potential mitigation measures				
Component wise Interventions	**Impacts and Risks**	**potential mitigation measures**	**Implmenting agency**	**Provisions in the EMF**
implementing agencies; • set up of a monitoring and evaluation (M&E) • contract an external M&E agency to monitor project activities and impact	memory • issues not being due to ineffective coordination between implementing agencies • inadequate trainings -- number and quality • selection of poor quality M&E agency • Low or no prior knowledge of implementing environmental and social safeguards • M&E is largely driven by State PCU through PIU- little or no involvement of communities in sub-projects resulting in limitation of availability of real time data	• delivering good quality training and continuous feedback to ensure improvement • careful selection of M&E agency • PCU needs to ensure streamlining ESMF in the planning stage of various interventions • Provide training at the cluster level in M&E for tracking project progress •		

6.4 Environmental Guidelines (EGs)

Environmental guidelines and actions have been prepared to guide the project management unit in taking proper measures for the environmental issues and concerns during preparation, implementation and operation activities. These include minor irrigation systems, water harvesting structures, village level CSCs and demonstration nurseries (PCDOs). Any project activity resulting in physical displacement or significant conversion or degradation of critical natural habitats would be ineligible for support through the project. Detailed EGs have been provided in Annex I Environmental Guidelines

An integrated strategy for managing soil/nutrients and pesticides has been included in the report to address concerns related to overuse of agricultural chemicals. The strategy takes into account the broad principles of achieving maximum production with minimum inputs that minimize environmental pollution and manage pests below the economic threshold level. All the methods (cultural, mechanical/physical, genetic, regulatory, bio-control and chemical) would be employed as per requirements. The chemical methods would be employed only when the pest attack exceeds the Economic Threshold Limit (ETL) and stand to cause severe damage to crops and selection of relatively environmental friendly pesticides would be undertaken. Banned pesticides would not be used and restricted pesticides would be used only as per state/national laws and provisions. More specifically, the strategy provides a year-wise roadmap for sensitization, awareness building, training, demonstration and capacity building of relevant stakeholders to adopt IPM approach. The IPM Strategy is listed in

Annex II: IPM and a List of Pesticides Permissable and Banned under the project is listed in

Annexure III List of Pesticides banned and permissible under the project.

6.4 Subprojects activities requiring EIA/EMP

The Environmental Officer will prepare the Terms of Reference for the EIA, and follow procurement rules for the recruitment of consultants for the ESIA. The issues identified during the desk review of environmental baseline and the impact mitigation measures provided in this ESMF may provide some basis for the design of the ToR.

The EIA will be based on the Detailed Project Report (DPR) for the subproject, and will identify and evaluate potential environmental impacts for the proposed activities, evaluate alternatives, and design mitigation measures. The preparation of the EIA will be done in consultation with stakeholders, and should identify key issues and determine how the concerns of all parties will be addressed in the EIA.

Table 33 Procedures for projects requiring an ESIA

First stage: Preparation of Terms of Reference. The results of identification, and extent of the ESIA (scoping), the terms of reference will be prepared by the Environmental Officer in the PCU.

Second stage: Selection of consultant
Third stage: Preparation of the ESIA with public consultation

The report will follow the following format:

a. Description of the study area
b. Description of the subproject
c. Discussion and evaluation of alternatives
d. Environment description
e. Legal and regulatory environment
f. Identifying potential impacts of proposed sub-projects, including cumulative
g. impacts
h. Process of public consultations
i. Development of mitigation measures and a monitoring plan, including estimates of costs and responsibility for implementation and monitoring.

Following the preparation of the EIA and EMP for the sub-project, the environmental officer in the PIU and PCU will review the documentsmake recommendationson the adequacy of the assessment as well provide guidance on how any outstanding issue/areas may be satisfactorily addressed. Copies of the EIA will be made available on in the state on the PCU, PIU websites and Bank Infoshop for availability and public comments.

Monitoring of the EMP parameters and the required mitigation measures included in contractor's ToR will need to be carried out by the PIU. Compliance monitoring would include inspections during construction of the project's components and licenses/clearences which are expected to be adhered to. The operational/ decommissioning phase of the sub-projects of the HPHDP will also be monitored

Table 34 Summary of Project Categorization Process and Responsibilities

No #	Stage	Institutional Responsibility
1	Determining of appropriate environmental category/assessment level	Environmental officer in PIU and PCU
2	If EIA/EMP is necessary	Environmental officer in PIU and PCU
3	Preparation of TOR	Environmental officer in PIU and PCU
4	Selection of Consultant	PIU, PCU Environment and Procurement Specialist
5	Preparation of environmental assessment	External Consultant
6	Draft document disclosure (in Country)	PCU
7	EIA Approval	State PCU and World Bank
8	Disclosure	State PCU and World Bank
9	Finalization of the EIA,EMP and Integration of environmental management plan issues in the tendering process.	PIU
10	Monitoring and EMP Reporting	Environment officer in PIU

Section C

SOCIAL MANAGEMENT FRAMEWORK

7.0 SOCIAL MANAGEMENT FRAMEWORK

7.1 Rationale and Objectives

Based on the assessment of social impacts and risks, field visits and stakeholder conslutatoins, a social management framework (SMF) has been prepared to guide the detailed social assessment, screening and preparation of plans and strategies as appropriate for the project interventions to be taken up under the project. The purpose, approach to preparation of the draft SMF and the entitlement framework containing the provisions for different project activities are presented in ensuing sections.

The SMF would apply to all project interventions under HPHDP at locations identified at this stage and at locations identified during project implementation.

7.2 Purpose

The specific purpose of the SMF is to:

a) develop a framework in line with provisions of relevant Acts and Rules, and other projects being implemented with financial support from multi-lateral funding agencies (Asian Development Bank, World Bank, etc.);
b) bring together and build upon the previous experiences, stakeholder interactions and good project implementation practices;
c) enhance institutional capacity at the State (PCU) and DIU and BIU for implementation of social management plans; and
d) establish mechanism and processes for grievances redressal and monitoring and evaluation, etc.

The Framework comprises the following:

- Screening of Packing, Processing and Market Infrastructure for selection of sites - already identified (at this stage) and to be selected in the future
- Social Inclusion Strategy
- Gender Strategy
- Tribal Development Framework (Indigenous Peoples Framework)
- Citizen Engagement Framework

7.3 Principles of the SMF

The broad principles of the Social Management Framework to be followed are described below:

- Compulsory acquisition of private land is to be completely avoided by exploring all viable alternative project designs and adopting a screening approach;
- take all required for land for the project activities or interventions on a voluntary basis i.e. either through: i) lease, ii) voluntary donationstated in agreements (WUA/FPOs), and iii) gift deed;
- take due precautions to minimize disturbance to sensitive locations or location having cultural significance;
- share information, consult and involve project beneficiaries in identifying social issues likely to arise during project implementation;

- Ascertain broad community support based on free, prior and informed consultation with all communities and in particular while preparing Tribal development plans .
- Pay special attention to small and marginal farmers, women and tribals and secure their participation in all project planning, implementation and instituiotnal proceeses, as well as project benefits;
- Ensure that project does not involve any kind of activities involving child labor; and
- Ensure equal opportunities and wage to women/female workers as applicable acts;

7.4 Screening for Adverse Impacts

The project proposes different types of infrastructure across various locations in the state. These involve both renovation, expansion or modernization of existing facilities and green-field investments. While in some cases, the locations are known, in other cases, these would be identified during project implementation. **No private land would be acquired under the project.**

Table 35 below presents details of approximate land requirement for each type of infrastructure and source of land.

Table 35 Approximate land requirement by type of infrastructure and source of land

Type of infrastructure/ intervention	Land requirement/unit		Source of land
	Bigha (local unit)	Hectare (ha)	
Component A			
Nurseries, Progency-cum-Demonstration Orchard (PCDO)	NA	0.01 to 0.5	PCDO or University land
Irrigation infrastructure (water storage)	As per demand		Land to be provided by registered WUA/FPO. Details to be included in the agreement between project and WUA/FPO
Centres of Excellence	NA	10 to 12	Already with Department of Horticulture
Component B			
Compressed Atmosphere Storages (CAs)	15-20	1.25 to 1.5	Existing land of HPMC /Horticulture Department
Agro-processing Centres	25-30	2 to 2.5	Existing government land or lease of land under section 118 of HP
Common Service Centres	NA	0.03	Panchayat land or individual land on lease in case of investor outside of the state (under Section 118 of Act H.P. Tenancy and Land Reforms Act, 1972: Himachal Pradesh Tenancy and Land Reform Rules, 1975)
Pack House	1.5	0.125	Existing government premises, horticulture department or transferred from government
Component C			
Market yards	12-15	1 to 1.25	APMC land
Source: Interactions with DoH, HPMC and Project Implementation Plan, HPHDP, 2015			

Each existing and identified site for any project intervention would be screened using format (See **Annexure VIII**) to assess adverse impacts, if any. The screening exercise would cover the following:

- impacts *on:*
    - *land, Shelter, fixed assets, crops, trees,*
    - *businesses or enterprises due to land acquisition and lead to loss of income sources and means of livelihoods*
    - *access to natural resources, communal facilities and services*
- Estimate on affected persons
- Nature/Type of affected persons (*Poor, female-heads of households, or vulnerable, Encroachers and/or squatters)*
- Nature/Type of Common Resource

Only sites without any encumbrances i.e. without encroachments or unauthorized occupation would be selected to site or undertake project infrastructure/interventions.

If for any project intervention, there is no existing land, then land would be either taken on lease, or as a gift(**See Annexure X** for formats provided by Department of Revenue, GoHP)or on voluntary donation basis from Farmer Producer Organizations (FPOs) or Water User Associations (WUAs)

7.5 Social Inclusion Strategy

The project would ensure inclusion of small and marginal farmers, women farmers and tribal farmers within the implementation structures, community institutions and proposed project interventions by undertaking the following:

Selection of Individual Beneficiaries: As stated in the PIP, criteria for selecting growers would be based on technical, financial and social parameters; distribution of planting material would be on first-come-first served basis. The project would ensure criteria developed would provide commensurate weightage to all such social groups and ensure such groups too have equal access to private goods or farm level interventions proposed under the project and avoids elite capture.

Representation in institutions/bodies formed: Many new associations or groups would be formed under the project such as Water user Associations, Farmer Interest Groups, Farmer Producers Organization, besides which existing growers associations and women's groups be supported. The project will include inclusive criteria for membership, representation, recording participation by social groups in meetings and institutional planning and decision making processes, membership in executive committees. Further such groups would also be adequately represented within grievance mechanisms and also in M&E activities including user satisfaction surveys.

Socially inclusive Benefit Sharing for shared/public goods: Under the project, Irrigation infrastructure involving selection of clusters (under Component A), provision of space for farmers in cold chain storages (under Component B) and Markets (under Component C) present areas wherein the better placed farmers can usurp project benefits. E.g. the PIP in case of irrigation infrastructure presents: low priority to isolated clusters and social and environment considerations, while in case of Cold Chain storages exclusively reserves one fourth of the installed capacities to individual needs of the farmers about are for such growers. Further it proposes in case of irrigation infrastructure, that the WUA shall be

involved right from the field investigations, survey, designing and formulation of the detailed project report. Hence, District level coordination committee responsible for ensuring adherence to selection criteria would ensure appropriate targeting strategies and suitable criteria/benefit sharing norms (in the Community Operational Manual) in selection of such clusters to cover all different social groups such as small and marginal farmers, women farmers and tribal farmers. Further, it would ensure that DIUs, BIU, Service Provider, NGOs, Community mobilizers are made conversant with these norms and effectively communicate such norms and provisions to the beneficiaries of these social groups. These would be monitored at the District level (DCIUs and DIUs) and PCU. PCU would be responsible to liaise with concerned bodies such as growers associations, women and child development department, tribal development department tribal advisory council in ITDP areas.

Information and knowledge Sharing: Project proposes information sharing vide workshops, training and exposure visits. Project would ensure that all participation at all such events would be fair representation of such groups. Number of participants by social group/category would be recorded along with suggestions/comments received. As women may be reluctant to move out of households for a period of few days for trainings, etc, efforts would be made to organize such events in proximity to their area.

Responsive interventions: The project would respond to many of the concerns directly heard/ expressed during consultations. E.g. provision of market yards, ropeways, beekeeping, vermi-composting, training on cultivation of mushrooms, exposure visits were some of the key demands that were expressed by participants. As there could be more such latent demands, it is recommended that at the time of collection of Baseline data for monitoring and evaluation purposes and also during consultations/FGDs with women, such requests would be elicited from the participants, diligently recorded and forwarded to DIU. The Social Development Specialists and SMS, HEO within the BIU and DIUs would review, explore the possibility and attempt to accommodate as many of such requests.

Capacity building: Female Community mobilizers - new and existing and locals in the tribal areas would be encouraged with commensurate incentives, provided with additional trainings as necessary with a view to engage them for the full project duration and thereby ensure that rapport established with such social groups is continued during project implementation and beyond.

7.6 Gender Strategy

The social assessment study highlighted the following:

- women contribute significantly to agriculture (except marketing of produce) and horticulture activities including horticulture trainings
- do not have ownership of land except in certain areas/tribal areas wherein women own land too
- enjoy fair representation in elected political bodies
- are desirous of trainings (mushrooms, onions) and exposure visits, etc. though are constrained by the inability to stay from their households for longer duration;
- Have many state government schemes for their empowerment including additional subsidies in agriculture and horticulture activities.

Overall, women engaged in agriculture/ horticulture development are key to improving agriculture and horticulture productivity, and would need to be engaged in project activities. The project will have potentially significant impact on promoting gender inclusiveness through employment creation in post-

harvest management and processing which traditionally employ a higher proportion of female labor. As women farmers are key project stakeholders and carry the risk being excluded, the strategy aims mainstream gender issues and concerns in all interventions at every stage, across all institutions and processes

Under the gender strategy, the project undertake the following:

a. Gender disaggregated socioeconomic baseline: The M&E consultant would include gender disaggregated information on women farmers and labour as part of the Baseline data collection for subsequent usage as part of M&E activities planned including mid-term and end-term evaluation and achievement of KPI;

ii) Focus Group Discussions and mobilization: In order to ensure their needs are well articulated, expressed, articulated and recorded, FGDs would be conducted using experienced community mobilizers/facilitators, besides engaging NGOs who specialize / have prior experience of working with women farmers, groups. Women and child development departments would be consulted for ensuring effective interactions. These FGDs or meetings would be scheduled in terms of time and location so as to maximize their participation. Such meetings would continue across all stages of every project intervention.

iii) Inclusion of women in associations, bodies: Even though women contribute significantly to the agriculture/horticulture activities, lack of land ownership impedes their access to interventions. Hence inclusion of women producers in farmer interest groups, water user associations and common service centers would be ensured. Besides, their inclusion would be ensured farmer selection criteria for provision of public/shared/private goods under various proposed interventions.

iv) Training and capacity building: Women farmers/groups would be provided with requisite technical training on management of orchards, soil, nutrients, pests and diseases; entrepreneurial support on indigenous beekeeping, vegetable cultivation, vermi-composting; participation of women producers in post-harvest management and market yards; and other demand driven income generation programs, including those supported under the horticulture mission. The training programmes/modules will be customized to meet women farmers' expectations and requirements. Trainings on-site, village-level demonstration and exposure visits close proximity of habitation would be ensured so that constraints in staying out of households for long duration is overcome. Financial literacy and accounting to enable access to financial services and exposure to market transactions would be encouraged. In case of women in tribal areas, such trainings would be conducted using culturally appropriate IEC materials and in culturally appropriate manner.

v) Socially inclusive Benefit Sharing for shared/public goods: Suitable criteria/benefit sharing norms in selection of such clusters to cover women producers, farmers would be ensured.

vi) Convergence with existing state level schemes for empowerment of women: Responsive interventions dovetailing project interventions with existing schemes for drudgery reduction e.g. provision of farm implements would be promoted by provision of such implements on a group basis.

vii) Gender dis-aggregated monitoring indicators: Such monitoring indicators would be developed to monitor and evaluate the project and would be used in the proposed i) process monitoring; ii) impact evaluation studies and thematic studies. User satisfaction surveys too would lay

emphasis satisfaction of women producers/farmers with project interventions, activities and processes.

viii) Inclusion in Grievance redressal mechanisms: Representation of women farmers in grievance mechanisms would be mandatory at all levels.

ix) Developing a female team of mobilizers/facilitators: Female Community mobilizers - new and existing would be encouraged with commensurate incentives, provided with additional trainings as necessary with a view to develop a team or cadre that would: i) facilitate faster outreach of project information to such women farmers/groups; ii) ensure adherence to selection criteria; iii) engage them for the full project duration and thereby ensure that rapport established with such social groups is continued during project implementation and beyond.

7.7 Citizens Engagement Strategy

Social Assessment indicated that many programs and schemes exist for the benefit of the farmers however communication on and community awareness of these schemes is rather limited, besides engagement thus far had been more focused on individual rather on a cluster as would be required in some of interventions under this project involving public/clubbed goods. Therefore, in a project of this nature involving many demand driven community based interventions and beneficiaries across different social groups, the citizen engagement strategy needs to engage with them to ensure intended outcomes are achieved. Key elements the strategy are:

i) Participatory planning, implementation and monitoring: Some of the project interventions such as Common Service Centers and their design, and planning and implementation of community water schemes would involve multiple stakeholders including small and marginal farmers, women, tribal, etc. In such exercises, inclusion and involvement of farmers across all social groups at all stages of planning, implementation and monitoring would be made mandatory. For this purpose, meetings organized and conducted would ensure representation of all such groups besides recording their attendance by category/group. Periodic user satisfaction surveys, continual process monitoring would lay emphasis on quality of interactions during such meetings.

ii) Use of ICT in beneficiary feedback, grievance redressal: Feedback from beneficiaries (through user satisfaction surveys), complaints or grievances would be recorded through innovative use of ICT systems. Such information would be collated at the District level for usage in planning and implementing and course and further reporting to PCU/PIUs.

iii) Information dissemination: Enhancing outreach on relevant horticulture programs and scientific practices related to management of planting material, orchards, soil, nutrients, mitigation of pests and disease; besides capacity building of FPOs and WUAs with respect to institutional functioning, record keeping, benefit sharing, and operation and management of water schemes and CSCs would be ensured. Other aspects would include: development and dissemination of training calendar, information on convergence of schemes; facilitate sharing of experiences amongst farmers through undertaking of exposure tours, besides provision of technical advice, demand estimation for project interventions

iv) Support to grievance redressal mechanisms: By information dissemination and technical advice and feedback the strategy would also support the grievance redressal system;
v) Monitoring beneficiary satisfaction: User satisfaction surveys would be a critical part of the strategy as it would help gauge the satisfaction levels and elicit the need for any additional or corrective actions.

vi) Social impact screening for post-harvest infrastructure, CSCs and minor irrigation schemes: Participatory screening for adverse impacts on land - existing government or newly identified land for planned infrastructure interventions such as market yards, CSCs, Irrigation schemes, would be key areas of engagement.

7.8 TRIBAL DEVELOPMENT FRAMEWORK

(Detailed framework is attached in Annex XII Tribal Development Framework)

HPHDP would be implemented across all the twelve (12) districts in the state. In the three major tribal districts - Chamba, Kinnaur and Lahaul-spiti, area expansion, rejuvenation and replantation under Apple and area expansions under the other fruits; setting up of PCDOs, greenfield packhouses, Compressed Atmosphere storage (CAs), FPOs and Common Service Centres (CSCs) would be major activities. Given the presence of scheduled tribes (indigenous peoples), the project triggers World Bank's Operational Policy (OP) 4.10 on Indigenous Peoples.

While some project interventions such as Market yards, Cold storages, area expansion are broadly identified by location, subsequent interventions would be planned in tribal areas based on demand assessment and with their free, prior and informed consent. No acquisition of lands is proposed for any intervention under the project and as a result, no direct impacts on tribal communities pertaining to land acquisition are envisaged. As activities such as irrigation infrastructure i.e. water storage/supply are demand driven, their actual locations would be known at a later date. Hence, the preparation of a Tribal Development Framework is a pre-requisite. The TDF would form the basis for preparation of TDP as and when the projects and site locations are identified and on screening whether the impacted population indeed possess the four characteristics as defined in the Operational Policy 4.10.

The principal objectives of TDF/IPDF are to:

- avoid or to minimize to the extent possible, any kind of adverse impact on the tribal community and to suggest appropriate mitigation measures;
- ensure that the project engages in free, prior and informed consultation with tribal people in the entire process of planning, implementation and monitoring of project;
- identify the views of tribal people regarding the proposed project and ascertain broad community support for the project;
- to ensure that project benefits are accessible to the tribal communities living in the project area;

The TDF would comprise the following key features:

i) **Awareness generation Activities and Informed Consultations**: It would involve conducting of FPICs, with tribal communities to generate awareness on the project and assess interest and demand for any project interventions. For this purpose, suitable culturally compatible IEC

materials would be prepared/used. These would be undertaken at all stages of the project i.e. while preparing and later implementing TDP to effectively reach out to the communities. During these FPICs, broad community support to the proposed interventions will be documented (See Annexure X for indicative format for FPIC) for this purpose, community mobilizers, preferably locals would be engaged. Participatory instruments such as Transect Walk, etc. would be deployed;

ii) **Socio-Economic Baseline**: The project would undertake a socio-economic baseline of all tribal clusters wherein project interventions would take place. It would enable to accord priority in selection for areas (of non-tribal) with higher proportion of tribal. Particularly in non-tribal area or clusters where demand for any project intervention is recorded. These would be undertaken by the M&E consultant within the first six months of project implementation.

iii) **Preparation and implementation of Tribal Development Plan (TDP)**: As there could be project interventions in non-tribal areas or areas having lower tribal population, a screening exercise would be carried out to assess if indigenous peoples are present in the project area and possess the following characteristics as defined in OP 4.10:self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; andan indigenous language, often different from the official language of the country or region.

iv) If the communities meet the above characteristics, particularly in non-tribal areas, a social assessment requires to be carried out. The social assessment is intended to evaluate the project's potential positive and adverse effects on indigenous people and to explore various measures which avoid adverse effects. If such measures are not feasible, the project would identify minimization or mitigation measures and should ensure that indigenous peoples receive culturally appropriate benefits under the project. The results from the screening process would determine whether a TDP would require to be prepared.

v) **Representation:** Efforts would be made ensure inclusion of small and marginal farmers and also women in any project intervention. Adequate representation for women and tribal would be ensured in any of institutions formed under the project such as FIGs, FPOs, WUAs, etc. Inclusion of Scheduled Tribes (men and women) in farmer organizations and their federations, especially in non-tribal areas would be ensured. In tribal-dominated areas, such bodies would be headed by tribal leaders. Also such representation would be ensured in any training, exposure visits, etc.

vi) **Special Provision for Community needs**: As such hard and backward areas could have specific community needs (e.g. ropeway for access, farm equipment, etc.) there would be a special corpus of funds at the PCU level that could be accessed based on business plans submitted by FIGs/WUAs or any specific needs as identified and recorded during FPICs conducted in these areas. Process for the same would be as follows:

vii) **Training and exposure visits**: Customized training modules (WUA guidelines, grievance resolution, use of farm inputs, implements, pesticides, fumigants, etc.) would be prepared and imparted n a culturally appropriate manner. Besides exposure visits would be suitably identified and organized. Capacity Building: Personnel - SMS, HEO, HDO, SDS, SDC, involved from PCU, BIU, DIU and other agencies would be oriented on tribal development and social safeguards issues, prior to commencing work in these areas.

viii) **External Support for preparation of TDP**: As the department has limited exposure to safeguard requirements or in preparation of such plans, its capacity would be augmented by provision of an External Consultant for an initial period of 2-3 years. Once adequate capacity is built within the line departments, TDP - preparation would be undertaken in house i.e. by the line department.

ix) **Convergence with existing tribal schemes**: As there exists many central sponsored and state level schemes, the Social Development Personnel at PCU and DIU will identify such schemes, inform the communities and promote convergence in so as to have a better spatial and demographic coverage and thereby maximize benefits from such intervention.

The implementation of TDF (including preparation and implementation of TDP) will be undertaken in accordance with overall project implementation schedule. As per the proposed institutional arrangements, there would be Social Development Coordinator at the Project Coordination Unit level at the state level. S/he would be supported by a Social Development Specialist at the District level, who in turn would be supported by the Horticulture Development Officer at the District Implementation Agency (DIU) and Horticulture Extension Officer (HEO) and Subject Matter Specialist (SMS) at the Block Implementation Agency (BIU). Community Mobilizers as necessary would be involved in preparation and implementation. Monitoring of TDF would be consistent with the overall M&E under Component D and its overall responsibility would lie with the PCU at the State Level. In this it would be supported by DIU and BIU. It would be responsible to monitor the project along agreed monitoring indicators. Budget for implementation of TDF. Key elements of the budget include provision of an External consultant for an initial period of 2-3 years, conducting of FPICs, preparation and dissemination of culturally appropriate IEC material, training and exposure visits as planned and budget for provision of any special community needs as may be identified during implementation.

SECTION D

INSTITUTIONAL & IMPLEMENTATION ARRANGEMENTS, MONITORING, GRIEVANCE REDRESSAL& BUDGET

8.0 IMPLEMENTATION, MONITORING, GREIVANCE REDRESSAL AND BUDGET

This chapter presents the institutional and implementation arrangements for the project overall, specific arrangements to implement ESMF and its implementation schedule in respect of the overall project cycle;the proposed monitoring and evaluation mechanisms including M & E indicators and finally features of mechanism to redress grievances.

8.1 Institutional and Implementation Arrangements

The implementation of various components and sub- components of the project shall be carried out by the following departments or Project Implementing Units as given in **Table below:-**

Table 36 Institutions Responsible by Sub Component

Institutions responsible by sub-component			
SN	**Component**	**Sub- Component**	**Implementing Department**
1	Component-A. (Horticulture Production and Diversification)	A.1 Enhance availability of imported rootstocks and cultivars	PIU-UHFand SPV
		A.2 On farm and community level investments:	PIU-Horticulture
		A-3 Demonstration and adoption support	PIU-Horticulture
2	Component-B (Value Addition and Agri-enterprise Development)	B.1 Common Service Centre and Farmers Producer Organizations	PIU-Horticulture
		B.2Supply chain infrastructure support	PIU-HPMC
		B-3 Agri-Enterprise Support (Agri-Business Promotion Facility) (ABPF)	PCU
3	Component-C (market development & sector stewardship)	C.1 Economic and Market Information and Intelligence Services (EMIS)	PIU-HPSAMB
		C.2 Development of negotiable warehouse receipts (NWRs)	PIU-HPMC
		C.3 Up-gradation and modernization of select agricultural wholesale markets	PIU-HPSAMB
4	Component-D (Project Management, Monitoring and Learning)	D.1 Project Management	PCU & PIU
		D. 2 Information and Communication Technology (ICT)	PCU & PIU
		D-3 Capacity Building	PCU & PIU
		D-4 Procurement arrangement(as per manual)	PCU & PIU
		D-5 Financial Management(as permanual)	PCU & PIU
		D-6 Monitoring and Evaluation	PCU
		D.7 Environmental and Social safeguards	PCU
		D.8 Project Redressal & accountability action Plan	PCU
Source: Project Implementation Plan, HPHDP			

Sections below present the state and district level project implementation arrangements.

8.1.1 State level

1. Overall management and coordination would be the responsibility of the HPHDP Society, a registered body established by GoHP to implement the project. The Society has a Governing Council and an Executive Body.

2. The Governing Council under the Chair of the Chief Secretary, Government of Himachal Pradesh, has Principal Secretaries/Secretaries of the implementing agencies, Principal Secretaries Finance and Planning, and Vice Chancellor of the State Horticulture University as members. Additional Chief Secretary – Horticulture is the member secretary. The council will meet once a year to provide overall strategic guidance, policy directives for smooth implementation, and monitor implementation of the project. The key role of the broad based governing council headed by the senior most civil servant in the state is to ensure a coordinated approach across different line departments and stakeholders in the project, and resolve any outstanding issues requiring high-level decision. The committee has the power to approve need-based changes in the design, budget and administrative issues in project implementation.

3. The Executive Body is chaired by the Additional Chief Secretary – Horticulture, and has Commissioners and Directors of theimplementing agencies as members. Project Director (PD), HPHDP is the member secretary of the Executive Body and representatives from NABARD and State Level Banking Committee are special invitees. It will meet quarterly to ensure efficient execution of project activities.

4. Coordination of day-to-day project implementation, planning and scheduling, procurement management, financial control, as well as reporting and monitoring will rest with the Project Coordination Unit (PCU), which is part of the HPHDP society. The PCU is headed by a full-time PD who will report to the Executive Body. The PCU will be responsible to:
    i. assist the implementing agencies in preparing annual plans and budgets;
    ii. monitor progress of project components/sub-components, preparing quarterly progress reports, evaluating performance, and providing feedback to implementing agencies;
    iii. ensure the financial reports are available, audited, and submitted to the World Bank within six months of closing of the financial year; and
    iv. Hire technical experts, and key consultants, as needed, for project implementation, monitoring, and technical evaluation.

    The PCU would be staffed by a team of professional staff and support staff, including a Chief Financial Controller, Procurement Specialist, M&E and MIS specialists, Social and Environment Specialists, Agri-business Specialist, Financial Services Specialist, and other technical personnel. In addition, the PCU would have representatives deputed from the participating implementing agencies, to coordinate with their respective department/agency.

Special Purpose Vehicle (SPV) for Nursery

A Special Purpose Vehicle (SPV), a registered body established by GoHP is responsible for the propagation of elite planting materials. With a view to ensure adequate availability of elite planting material to the growers in the state, a conscious decision has been taken by the State Govt to re-organise nurseries/ Progeny cum Demonstration Orchards into Special Purpose vehicle (SPV) an autonomous body registered under the societies act.

It would be the responsibility of the SPV society to create need based infrastructure, which inter alia includes land development, creation of assured irrigation facilities, strengthening of existing building, stores, fencing etc., so that the following important activities to be undertaken in the PCDOs/ farms are carried out efficiently and effectively. During the project processing, the GoHP had taken an early action towards the implementation of the specific reform of restructuring of Progeny Cum Demonstration Orchards (PCDO) of Department of Horticulture (DoH), by hiving off selected PCDOs into a Special Purpose Vehicle (SPV), and provided a governance structure with financial and administrative autonomy. This has been done with the objective of enabling sustainable production of high quality elite planting material for different fruits crops. A MoU will be signed between the DoH and the SPV for transfer of the identified PCDOs along with the assets and seconded staff. This SPV would be operated on commercial basis, and it would reinvest the funds generated, into the operations and maintenance of the organization, and the SPV is expected to become a financially viable organization after the first three years of operations. As the need arises and based on the performance assessment at midterm, the legal status of the SPV would be changed from Society to Company. Further, international and national consultants will be recruited to provide technical assistance on the best available technology and practices adopted in horticulturally advanced countries of the world.

Four Project Implementing Units (PIUs) have been setup within the Department of Horticulture, Himachal Pradesh Horticulture Processing and Marketing Corporation (HPMC), Himachal Pradesh State Agriculture Marketing Board (HPSAMB), and University of Horticulture and Forestry (UHF) to oversee the implementation of their specific activities. These PIUs will be responsible for preparing, implementing and monitoring their respective annual action plans. A nodal officer has been appointed by each department to effectively liaise with the PCU. Besides the nodal officer, each PIU will be supported by procurement, finance, safeguards, and technical specialists, as needed.

The PIU acts as a link between the PCU and the final beneficiaries. The PIU also get the assistance of the concerned district or regional officer of their department in order to ensure smooth implementation. The PIU's of the line departments shall function under the overall guidance and control of the respective head of the department. It will comprise of Nodal Officer of the rank of Class I officer drawn from the departmental cadre with the support staff. The head of the department will constantly monitor that the activities pertaining to the department are being implemented in accordance with the strict observance of World Bank guidelines and as per schedule of the project.

Using project funds, PCU and the implementing agencieswill hireservice providers (e.g., international institution, consulting firm, academia, or others) to deliver the technical assistance needed for strengthening their institutional capacity and supporting their PIUs with the implementation of component-specific activities.

8.1.2 District level

At the district level there would be two committees - a coordination committee and an implementation committee.

District level Coordination committee would be responsible to ensuring coordination and review the project progress at the district level, a District Coordination Committee (DCC), headed by the Deputy Commissioner, comprising all implementing agencies, lead bank, with Deputy Director of Horticulture as member secretary, will be established. The committee at the District level shall comprise of the following:-

1. Deputy Commissioner (chairman)
2. Deputy Director of Agriculture (member)
3. Manager, Lead bank of the District (member)
4. Executive Engineer, IPH (member)
5. DGM/Regional Manager, HPMC (member)
6. Secretary, APMC of the District (member)
7. Deputy Director of Horticulture (member secretary)

The DCC would have the responsibility to ensure that (i) the participant selection criteria is adhered to, consistently, by all the implementing agencies; and (ii) at a micro level, the convergence of complementary activities is maximized (e.g., on-farm irrigation development through micro irrigation, weather insurance, etc.). DCC would be supported by Block level Implementation Units (BIUs) consisting of Horticulture Extension Officer (HEO), Subject Matter Specialist (SMS), Irrigation Specialists, and Community Mobilizers/Facilitators.

District Implementation Unit: The implementation of activities pertaining to Horticulture Department shall be looked after by the Deputy Director of Horticulture in respective District of the State. He/She is assisted by the Subject Matter Specialists and Horticulture Dev. Officer at the District headquarters and block level. The Deputy Director of Horticulture is head of office as well as drawing disbursing officer in respective district and actual execution and implementation of project activities shall be carried out at this level. It would comprise of the following members:

Table 37 Institutional Structure of District Implementation Unit

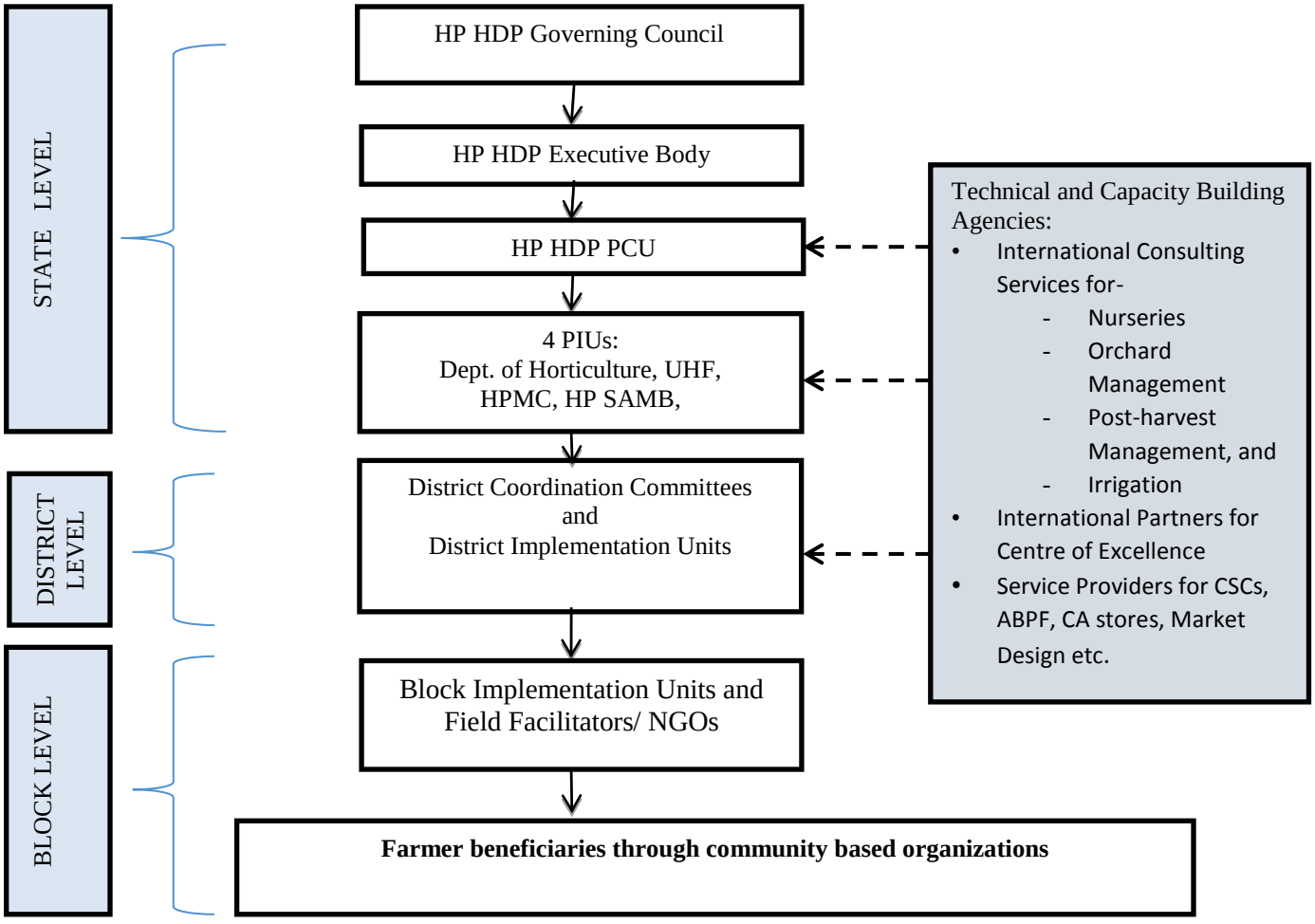
Designation	Numbers
Govt staff	
Deputy Director of Horticulture	One in each District
Subject Matter Specialist	One each at the District level
Horticulture Development Officer	1-2 for each District
Hired staff	
Bank / Financial Specialist	One for each District (except Lahaul & Spiti)
Agribusiness expert	One for each District (except Lahaul & Spiti)
Social Development Specialist	One for each District (except Lahaul & Spiti)
Irrigation Team	
Junior Engineer	One for each District (except Lahaul & Spiti)
Draughtsman	One for each District (except Lahaul & Spiti)
Surveyor	One for each District (except Lahaul & Spiti)
Source: Project Implementation Plan, HPHDP, 2015	

8.1.3 Block level

Block Implementation Unit (BIU):A subject matter specialist has been posted at the Sub division level to oversee the activities of 2-3 Dev. Blocks falling under the jurisdiction of the subdivision. He/she shall be assisted by the Horticulture Dev. Officer and Horticulture Extension Officer posted in each Block. At the Block level the Subject matter Specialist of the Sub- Division and Horticulture Development officer of the respective Blocks shall be responsible for the implementation of the project activities in their jurisdiction. They shall be assisted by the Horticulture Extension Officers posted at the HEC/PPC level. Block team shall comprise of following:-

Table 38 Institutional Structure of Block Implementation Unit

Designation	Numbers
Govt Staff (Deputed from Horticulture Department)	
Subject Matter Specialist(SMS)	One SMS for two blocks
Horticulture Development Officer(HDO)	One HDO per block (78 blocks)
Horticulture Extension Officer (HEO)	3-7 HEOs per block
Irrigation Team (Hired staff)	
Junior Engineer	One for each block
Draughtsman	One for each block
Surveyor	One for each block
Facilitators /Community mobilizers	1-3 per block
NGOs	As decided based on need
Source: Project Implementation Plan, HPHDP, 2015	



Source: Project Implementation Plan, HPHDP

Figure 8 Implementation Arrangements for HPHDP

8.2 Roles and responsibilities specific to ESMF implementation

5. There would be a separate Environment & Social Cell (ESC) within the PCU. This cell will have one Social Development Specialist and one Environment Specialist and will be responsible to coordinate with the participating Project Implementation Units (PIUs). The Social Development Specialist and one Environment Specialists at the PCU level will interact with the PIU-Horticulture, HPMC &HPSAMB and the DIU & BIU responsible to coordinate community mobilization towards ESMF and TDF implementation. In addition, Social Development Specialists would be contracted at the DIUs. The Horticulture Development Officer (HDO) in PIU (Horticulture) will be designated as Community Extension Officer and the Nodal Officer, PIU (HPSAMB & HPMC) will be given additional responsibility of Community Extension Officer for attending to safeguards aspects under the project.To address theissue of lack of capacity amongst the implementing agencies, a capacity development and training programme will beundertaken for whichprovision has been made under Capacity building cost tables.

6. Roles and responsibilities specific to ESMF implementation are presented below:

Table 39 Roles and responsibilities by implementation agency

Agency	Roles and Responsibilities
E&S Cell at PCU (& PIUs)	*Overall* • To prepare Annual Action Plan in consonance with PDO; • Clear project based proposals/ requiring approval of Project Director at PCU level and approve projects • contract service provider/NGO and external consultant (for preparation of TDP) as necessary • overall responsibility for implementation of TDF (and SMF) rests with the E&S specialists at the PCU would oversee, monitor & review implementation of the ESMF and TDF implementation for project activities in close association with PIU, DIU, financial Institutions, farmers, societies, grower associations, self-help groups, state institutions and other similar entities; • liaise with relevant PIUs, other government departments and in case of tribal areas liaise with Tribal Development Department, Tribal Advisory Council and HP SCST Development Corporation as necessary; *Reporting* • Prepare and submit Monthly, Quarterly, Annual progress reports to the concerned authorities • provide orientation, training to concerned personnel of DIU and BIU on ESMF provisions; *Planning and approval* • undertake field visits and participate in FPIC consultations periodically; • in respect of TDP, review findings from screening exercise, review and approval of TDP prepared by DIU; • organize exposure visits as necessary; • promote convergence /dovetailing of existing schemes with project interventions; and *Citizen engagement* • Operationalize Information Communication Technology (ICT) enabled Management Information System (MIS) up to grass root level *Monitoring* • contribute to internal monitoring of TDF implementation; and

Agency	Roles and Responsibilities
	Grievance redressal • provide support as necessary in resolution of grievances
DIUs	*Overall* • responsible for implementation of activities pertaining to Horticulture Department, would be responsible for implementation of ESMF and TDF components of implementation; • contribute to preparation of annual action plans under the project *Planning and implementation* • provide necessary support to M&E agency in collection of Baseline data • participate, interact, consult with all level district level stakeholders on preparation and implementation of annual activities; • provide guidance and be responsible for preparation of culturally appropriate IEC materials for interventions in tribal areas • support District Coordination Unit in ensuring adherence to farmer selection criteria • responsible for implementing strategies for inclusion, women and tribal • in respect of ESMF and TDF, participate in training provided by PCU on TDF provisions; • In respect of TDP o initiate screening exercise, o review its findings and o participate in FPIC consultations during planning and implementation; o initiate preparation of TDP and o seek/obtain approval from PCU; and o disclosure TDP; • promote convergence /dovetailing of existing schemes with project interventions; • undertake field visitsas necessary; *monitoring, reporting* • provide support to District level Coordination Unit in internal monitoring of project activities and specifically on ESMF and TDFby reporting on a quarterly basis; and • support activities of M&E agency throughout project cycle
BIUs	*planning and implementation support* • Provide support as necessary to HDO and also to the SDS at the DIU in implementation of ESMF and TDF • provide support to BIU and DIU in internal monitoring of project implementation (including ESMF and TDF) by reporting on a quarterly basis; • participate in FPICs during preparation of TDP; • Propose /provide support as necessary in sharing of ideas through exposure visits, trainings, etc. • mobilize communities, create awareness on the project • communicate information regarding TDF; • generate demand by holding multiple consultations, if required; • organize FPICs, FGDs with special groups as necessary; • record meeting discussions and thereby support SDS (DIU) in preparation and implementation of TDPs; *Monitoring* • provide support to monitoring and evaluation exercises; and *grievance redressal* • respond to queries, complaints on the subject matter and thereby contribute to the grievance redressal;
External	*Preparation and implementation support*

Agency	Roles and Responsibilities
Consultant (for preparation of TDP)	• Provide support to PCU,DIU and BIU in preparation of TDP; • participate in FPICs conducted at identified project locations; • provide inputs to the preparation of culturally appropriate IEC materials for interventions in tribal areas; • Provide inputs, orientation and requisite training towards building capacity for the personnel of the project implementing agencies.
External consultants for preparation of EIA EMP	*Preparation of EIA/EMP to support high impact infrastructure sub projects* *The consultant will carry out a detailed environmental impact assessment of the proposed project activities and suggest applicable design alternatives and mitigation measures* *The consultant will also prepare an environment management plan to be followed and monitored during construction and operation phases of the sub project*

9.0 MONITORING, EVALUTION AND REPORTING

9.1 Monitoring & Evaluation

The results monitoring and evaluation system (M and E) takes into account the comprehensive nature of the operation and includes the following core elements: (i) a rigorous impact evaluation with baseline, midline and end line household and community surveys allowing for adjustments during implementation; (ii) an ICT-based Integrated Horticulture Management and Monitoring System (IHSMS) for monitoring project implementation; and (iii) a reporting system with half yearly and annual progress reports with data generated from the IHSMS. In addition, the project will introduce ICT-based tools to capture beneficiaries' feedback; assess changes in the performance of beneficiaries over time; and real time monitoring and evaluation of all the activities carried out under various components of the project. The M and E system will leverage the potential of geographical information system (GIS) for evidence based monitoring and planning. The M and E system would allow tracking of small and marginal farmers' inclusion in project investments, interventions, and community institutions. It will also for monitoring of gender inclusion and impact and facilitate gender disaggregated analysis. The baseline will involve a gender focused module, including work time dimensions of women engaged in horticulture.

9.1 Project Coordination Unit (PCU):

(i) The PCU will also be responsible for:
(ii) analysis of all project-level M&E information and generation of regular 6-monthly M&E reports;
(iii) updating key performance indicators by consolidating the information provided by different implementing agencies and the external M&E agency;
(iv) conducting independent field visits to monitor implementation and outputs of selected project activities;
(v) commissioning special M&E studies as needed;
(vi) maintaining the Project Management Information System (PMIS);
(vii) identifying bottlenecks and corrective actions, if needed; documenting success stories;
(viii) regular reporting to the Project Management Committee and the Project Steering Committee; and six-monthly reporting to the World Bank on the project status.

9.2 Project Implementing Units (PIUs)

Nodal officers in each of these PIUs will be responsible for process and performance monitoring of the individual activities within the purview of the respective agencies. They would be responsible for (i) consolidating and analyzing all M&E data provided by district, block officers, and service providers, as relevant; (ii) validating M&E data in the PMIS entered at the District/Block/market level and entering additional data as required; (iii) monitoring field level activities and identifying corrective actions, if needed, as well as documenting success stories; and (iv) providing monthly reports to the PCU. Furthermore, implementing agencies, through their district and block offices would assume the primary responsibility of collecting data to update the process and performance indicators. The data would be consolidated and managed by the relevant PIUs and PCU.

9.3 M&E Consultant

The primary responsibility of the M&E consultant is to create an M&E framework for the entire HPHDP project in consultation with the PCU and PIUs. This framework must be aligned with the project and intermediate outcome indicators. In order to do so, the M&E consultant will define key process and performance monitoring indicators, data collection frequencies, and formats for collecting the relevant information. The M&E framework will clearly specify data collection responsibilities of the different implementing agencies and the external consultants. The M&E consultant will be responsible for collecting data for their independent monitoring, of both process and performance indicators.

Specific Responsibilities of the M&E consultant are to: (i) conduct the Baseline Survey for the project; (ii) monitor and evaluate the progress in the provision of critical project inputs and activities; (iii) evaluate progress in achieving the project outputs and outcomes and evaluate the project's impact at key junctures during the project period, to assess progress towards achieving project's objectives; (iv) strengthen the capacity of the project implementing agencies to monitor the project impact and use the PMIS by providing on-the-job training; (v) design and implement a Participatory M&E System (PMES) using state-of-the-art methods and tools that will monitor the performance of relevant activities such as the activities of community level institutions, FPOs . The consultants shall identify suitable participatory M&E mechanisms and tools such as the use of community score cards, focus groups, and participatory social auditing. The methodology and approach for the PM&E shall be designed in close consultation with the key stakeholders and will be finalized in consultation with the PCU (vi) prepare six-monthly M&E reports for the PCU which would summarize the achievements of the preceding six months, cross-cutting issues and recommendations, and updated project indicators; and (vii) provide three comprehensive reports - the baseline survey and two impact evaluation assessments at the time of the 2nd, project mid-term review and at project completion.

Baseline Survey. The baseline survey for the project will collect information that will aid in project planning as well as to provide baseline values for the M&E framework. The baseline survey will be completed within the first six months of project implementation. In order to enable an impact evaluation of the project,the baseline survey will include would disaggregated data analysis for i) small and marginal farmers; ii) women farmers; and iii) SC and ST farmers. It will also include a special module with respect to women farmers (time work dimensions) and small and marginal farmers.

Impact Evaluation and Thematic Studies. In addition to the regular six monthly monitoring reports, there are two junctures during the project period where impact assessment studies will be undertaken by the M&E agency. These studies will evaluate HPHDP's performance and progress towards achieving the project's development objectives. The first impact evaluation would be at the time of the second mid-term review (II MTR) of the Project, and, the second impact evaluation around the time of the Project completion. The first review (MTR) would include an impact assessment of the project to date, and also focus on procedures, implementation processes and recommend adjustments in the project design and/or implementation arrangements to overcome the identified bottlenecks. The second major impact evaluation review would be a comprehensive overall impact assessment, including quantitative and qualitative assessment of progress, against project development objectives. The M&E Consultant will also carry out thematic studies to inform the implementation of the project and to serve as a source of learning for the PIUs involved. The impact evaluation studies and analyses would include a disaggregated assessment of impacts with respect to i) small and marginal farmers; ii) women farmers; and iii) SC and ST farmers. Specific Thematic study and analyses would be undertaken with respect to women farmers and small and marginal farmers.

9.4 Project Management Information System (PMIS)

An integrated project monitoring and management system leveraging the potential of ICT and new media technologies will be designed, developed and deployed under the project. The M&E system will use the features of GPRS enabled mobile devices and data analysis tools, to enable submission of data relating to the project activities under each of the components, directly by the field functionaries. This data submitted,will be Geo tagged and time stamped, thus enabling real time and evidence based monitoring of all the project activities. The project monitoring and management system will generate automated reports for all the PDO indicators, customized for each level of project administrators (role based access to data). Project would hire a consultant to develop and deploy this system. During preparation, a functional requirement study for preparing this system has been initiated. The IHSMS system will also track participation and benefit access of small and marginal farmers, women beneficiariesand SC/ST beneficiaries of the project under the various project components and departmental schemes. These indicators would be fully integrated in the project MIS.

9.5 User Satisfaction Surveys

PCU & PIUs would conduct such a survey with the assistance of the SP for M&E, since findings often help to pinpoint areas of vulnerability that may have been missed during the mapping exercise. These surveys will be conducted by the SP for M&E at the end of II year and IV year concurrent with the submission of the M&E Report. The parameters will mainly comprise of no. of farmers satisfied with the improved infrastructure, no. of private players satisfied with the introduction of reforms, no. of PPP enterprises that have reached their break-even point (BEP). The universe for the survey will be the area of operation of the SPV, CSC, Private sector investments under the HPMC, APMCs selected for the development & implementation of Modernization & Improvement Plans. The construction of the survey questionnaire (and its translation in local language, Hindi) will be done by the SP in consultation of the PCU. The survey findings on satisfaction would be disaggregated and analyzed with respect to i) small and marginal farmers; ii) women farmers iii) SC and ST farmers as well as tribal/backward areas.

9.6 ESMF Implementation Reporting.

The six-monthly project progress reports would include, inter alia: (a) up-to-date physical and financial expenditure data compared to annual and end-project targets; (b) updated indicators of project performance compared to annual and end-project targets; (c) successes and problems encountered during the reporting period with suggested remedial actions; and (d) ESMF implementation progress as well as socio-economic and environmental impacts and issues related to the project The project would conduct an ESMF implementation review/audit in the 2nd and 5th year of the project through external agencies. .

9.6 Monitoring Indicators

Indicators to be followed while monitoring project implementation would be as per provided in Annexure XI Implementation of the ESMF and TDF would follow the activities planned as per the overall project cycle. **The Table** Below presents the implementation schedule

Table 40 Arrangements as per Sub Project Cycle

Phase	ESMF (and TDF) Activity	Objectives	Process	Responsibility	Outcome
Pre-planning	**Identification of subproject/intervention and Screening of activities and categorization depending on impact**	To ensure that sub-projects with potentially significant environmental/ social issues are identified at an early stage and avoided.	Evaluate all the available information /on environmental and social aspects. **Environment**: Use EMF categorization of projects to indicate high/low impact. Based on this level of expected environmental and social impacts, field visits, compiling with regulatory requirements the sub-project is eligible for selection or rejection. **Social:** Use the Social Screening checklist to screen projects for adverse impacts and to assess mitigation measures if any are required Conduct FPICs in Tribal areas (and in non-Tribal areas with persons meeting characteristics laid out in the OP 4.10) to ascertain broad community support	Implementing Agencies, SPs/ Design Consultants, E&S Cell, District level Social Development Specialist and TDP consultant /Block level officials	Sub-project selected/ rejected and categorized according to Low or High Impact. Based on screening, ascertain if any mitigation is required and whether TDP is to be prepared Selection of activities to be taken up for planning and design and finalizing procedures to ensure compliance with triggered policies.
Planning	**Preparation** DPRs with EIA, EMP Design of Project interventions using EGs and Social Strategies (Gender, Social inclusion and Citizen engagement)	To integrate the ESMF provisions into sub-project DPRs. To ensure that relevant environmental and social issues have been identified and appropriate mitigation measures have been designed to address them.	**Environment**: For all high impact sub-projects, an external consultants will prepare EIA EMP along with the DPR. For all low impact sub-projects, with, environmental guidelines and mitigation measures detailed in the ESMF shall be incorporated by EAs Social: Include provisions at every level as per Social Strategies. For projects requiring TDP, conduct FPIC, social assessment (as per given TDP outline) including baseline	Independent Consultants and PIUs District level Social Development Specialist and TDP consultant /Block level officials	EIA EMP and TDPprepared as part of DPR and disclosed prior to commencement of civil works for the subproject. Costs of EMP and TDP monitoring incorporated into the DPR.
Implementation	**Implementation** Implementation of Environmental and social Guidelines and mitigation measures. Compliance with EMP provisions and monitoring measures	To ensure that the prescribed environmental and social mitigation measures (including construction stage) are implemented.	**Environment**: The prescribed environmental mitigation measures (construction stage measures) as identified through the EMP are adequately implemented, indicators are monitored For subprojects with low impact, the PIU needs to report on mitigation measures that have been implemented. Social: Implement laid out provisions as per social strategies including inclusion criteria, special provisions for Tribal; continue conducting FPICs	E&S Cell, PIU District level Social Development Specialist TDP consultant /Block level officials	Monthly EMP reporting for high impact subprojects Semi-annual safeguards progress report will indicate: • That EGs have been incorporated into the implementation phase of low impact subprojects. • monitoring as per indicative list of indicators (provided in Annexure XI) including grievances

Phase	ESMF (and TDF) Activity	Objectives	Process	Responsibility	Outcome
O&M	**Supervision, Monitoring and Evaluation** Environmental supervision and monitoring	To ensure that environmental and social aspects are integrated into the sub-projects	**Environment**: Monitoring of indicators will be conducted as per project monitoring protocol. Environmental monitoring for operational facilities as per the EMP and EGs- conducted by the designated environmental officers of the implementing agencies for all the sub-projects Social: Conduct user satisfaction surveys and other M&E activities; continue conducting FPICs	PCU, PIU NGOs?	PMU will submit bi annual reports to The World Bank on Safeguards Implementation.

Table 41 ESMF Year wise implementation schedule

S.No.	Activity	Months (7 years/84 months)													
		6	12	18	24	30	36	42	48	54	60	66	72	78	84
Initial Establishment activities															
1	Setting up E&S Cell within PCU, PIUs														
2	Contracting of Environment specialist/ officer and SDS at DIUs & M&E specialist at PCU														
3	Prepare information on IPM and pesticide use including list of pesticides and insecticides which are banned														
4	Setting up/operationalizing GRMs														
5	Contracting of M&E agency														
6	Operationalizing ICT enabled MIS system under Citizen engagement strategy														
7	Development of socially inclusive criteria for selection of farmers, farmer clusters and its dissemination														
8	Develop Community Operations Manual for water harvesting structures including guidelines , criteria, etc.														
9	Provision of orientation training on ESMF & TDF and safeguards														
ESMF & TDF implementation															
10	Collection of Baseline data - gender disaggregated by M&E														
11	Contracting of External Consultant (for TDPs) and contract renewal till 3 years														

12	contract renewal for External Consultant (for TDPs) till 3 years														
13	Provision of refresher training on ESMF & TDF and safeguards														
14	Introduce IPM														
15	Introduce vermi compost production														
16	Plan and Implement TDPs														
17	*Prepare Culturally Sensitive /Appropriate materials*														
18	*Liaise with relevant Tribal bodies*														
19	*Conduct FPICs*														
20	*Identify Special Community Needs*														
21	*Identify convergence of schemes*														
22	*Implement TDP*														
23	Conducting of Consultations, FGDs, FPICs (including transect walks, if necessary)														
24	undertake Screening on identified land to ascertain impacts														
25	Identify and Take land voluntarily as required for project infrastructure														
26	Payment of Annual lease amounts														
27	Developing of Annual Training Calendar including needs expressed														
28	Deliver /Provide Trainings														

Monitoring & Evaluation															
29	Undertake internal monitoring on ESMF & TDF Implementation (using suggested indicators)														
30	Conduct user satisfaction surveys and Thematic studies														
31	Conducting Impact evaluation at II Mid-term review of project														
Reporting															
32	Submit half yearly monitoring reports including E&S issues														
Project Completion															
33	Conducting Impact evaluation at End-Term of project (using suggested indicators)														

10. CAPACITY BUILDING AND TRAINING

The project stakeholders will apply Environmental and Social safeguards mentioned in ESMF in all project activities during planning and implementation phases. Capacity Building or project staff is vital in maintaining the sustainability of the project, emphasizing on knowledge development and skills building. Capacity building exercises including orientation, technical, refresher, advance trainings, workshops and exposure visits, focusing on ESMF safeguard implication and monitoring, would be undertaken. These will be organised in accordance with capacity development strategy of the project. The capacity building exercises along with monitoring and learning process would not only help to ensure the environmental and social safeguard application, but also develop awareness and understanding towards environmental solutions by the communities. The training programmes will be coordinated and anchored by the PCU

The key objectives of the training plan are:

i. create awareness about HPHDP activities and their environment and social impacts
ii. create awareness about the Environmental Guidelines, activities as per social strategies that provide information on how to mitigate or avoid those impacts
iii. To create awareness about the concept, approach and processes of ESMF including selection of sub-projects, application of the specific EGs, social strategies, preparation of EMPs, TDPs monitoring performance of ESMF and reporting
iv. Application of ESMF, TDF and monitoring EMPs, TDPs for specific activities

Trainings on IPM

IPM is a key project strategy and hence trainings on how to implement IPM would also need to be mainstreamed. The measures provided in the EMF are to be incorporated at the time of planning an intervention, technical training on those components should be covered as a part of mainstream project training activities along with integrated crop management.

Exposure Visits: Exposure visits for staff will be organised to different Horticulture, Agriculture projects in different parts of the country to broaden their concept and vision on integrated crop management, integrated pest management and environment and social best practices which mainly help in bringing attitudinal change in the farmers. For the adopter farmers, visits will also be organized to research institutions on soil & water conservation, horticulture and agricultural universities existing near the project area in order to expose them and link them with these institutions for support in the future.

Type of Training	Frequency	Target Group	Content	Modality
Orientation training ESMF	Launch of Project + Yearly	PCU, PIU , DIUs, BIUs	• Sensitization on potential environment and social impacts and their mitigation measures and application within a sub-project cycle • Brief concept of SMF, TDF, EMF, EGs, EIA, Social Strategies • Institutional arrangement for implementing ESMF& TDF	Lectures, Presentations
State level Training	Twice a year	Environment and Social Specialist PMU& SDS, DIU Environment and Social Specialist in designated PIUs Service Providers and NGOs, Tribal Development Consultant	• Sensitization on potential environment and social impacts and their mitigation measures • Environmental EGs&activities within social strategies including Screening • ESMF process, institutional arrangements for implementing ESMF& TDF • Applying EGs and monitoring of EMPs, TDPs • Integrated Nutrient Management/Pest Management	On field demonstrations, case studies and best practices. Lectures, Presentations Exposure Visits
District Level	One in each district where project has investments Refresher Trainings	Environment and Social Specialist in designated PIUs Service Providers and NGOs Lead Farmers Representatives of FPOs, Tribal Development Consultant	• Environmental EGs • ESMF process, institutional arrangements for implementing ESMF • Applying EGs, Screening, Social Strategies in design and operation • Integrated Nutrient Management/Pest	On field demonstration, presentations, lectures and best practices Exposure Visits

Type of Training	Frequency	Target Group	Content	Modality
			Management	
Block Level	One in each Blockwhere project has investments Refresher Trainings	Environment and Social Specialist in designated PIUs Service Providers and Horticulture Extension Officers, Subject Matter Specialists, Tribal Development Consultant Lead Farmers Representatives of FPOs	• Environmental EGs • ESMF process, institutional arrangements for implementing ESMF • Applying EGs, Screening, Social Strategies in design and operation • Integrated Nutrient Management/Pest Management	On field demonstration, presentations, lectures and best practices Exposure Visits
Farm Level	before interventions are initiated Refresher Trainings	Members of WUA Members of FIGs/FPOs Lead Farmers Adopter Farmers in cluster, small and marginal, women and tribal farmers	• Environmental EGs and activities within Social Strategies • Applying EGs in design and operation • Integrated Nutrient Management/Pest Management • Training on water conservation, water usage, operations and maintenance of WHS. • technical knowhow, extension, and practical training on management of orchards, soil, nutrients, pests and diseases, nurseries; • Training and entrepreneurship promotion in indigenous beekeeping, vermi-composting, fruit processing, nursery management/development (grafting, budding, etc.)	On field demonstration, presentations, lectures and best practices Exposure Visits

11. IMPLEMENTATION BUDGET

ESMF& TDF Budget

Thecost of ESMF implementation comprises of staffing, trainings, capacity building activities, engagement of NGOs, M&E consultants, etc. and has been budgeted as part of the overall project costs. Cost of implementation of TDF including conducting FPICs, preparation of IEC materials, Training and Exposure visits, External consultant to provide support in preparation of TDPs (for 2-3 years) additional resource persons, specific project investments, feasibility study on organic GI certification and provision of funds for meeting any special community, as identified (included under Component A) are included in the TDF budget. All these costs of procurement would be met with World Bank funds following World Bank

In view of the environmental and social management measures to be implemented, necessary budgetary provisions should be made in the DPRs for the individual projects requiring EIA/EMP. Tentative budget for each of the project should include the environmental management costs other than the good engineering practices, cost of environmental monitoring.

Budgetary estimate for fulfilling the project requirements as per ESMF is estimated to be about INR 18.6 crores. Remaining is towards environmental management & capacity building.

12.0 GRIEVANCE REDRESSAL MECHANISM

12.1 Grievance Redressal Mechanism

7. The GRM would comprise of arrangements at PCU and PIU levels, Complaint Handling Mechanisms, User Satisfaction surveys. These are described below:

12.1 PCU and PIU level

8. The GM (Technical & HRD) in the PCU and the Nodal Officers of PIUs will be appointed PIO's or any other officers already appointed in implementing line departments. Similarly, PD in PCU and the Heads of the Departments would be the Appellate Authorities to decide upon the appeals pertaining to RTI. All the names of these officers will be displayed on the projects website. All the line departments have already information officers and Appellate officers functioning in their offices and institutions under their control assisted by the Govt. from District level to State level. Regional information Commissioners and State information Commissioners are appointed under RTI Act, who function as state level appellate authority. In order to ensure proper education of all the stakeholders in this regard, the implementation of the reforms and their expected benefits to the stakeholders will be given wide publicity in the project vicinity. Contact persons & their contact addresses/phonons. will also be displayed prominently for the knowledge of the farmers, traders, commission agents, etc.

9. The members of beneficiary institutions, viz., Horticulture, HPSAMB (APMC), HPMC, CSC, along with the prominent personalities of the village where Project interventions are undertaken would be involved quarterly to get the feedback of the activities undertaken in the Project. The details of feedback would cover the following: (a) quality of the work performed, (b) misappropriation of allocated funds, (c) the progress of work compared to the timelines of the Project, (d) dissemination of the Project details, and (e) transparency in the conduct of the Project activities. The district officer of the concerned line dept. would collect the data of feedback from such villages by sending personnel to such villages on quarterly basis and submit the data so collected to the concerned PIU through MIS. The format for the feedback would be devised by the respective PIU and sent to all the district offices of the concerned line depts.

10. The Grievance Redressal Officer and the Appellate Authority for the redressal of the grievances for various sub-components in the project, along with the time period stipulated for addressing the complaints finally, are given below. **The contact details will be disclosed on the project and PIU's websites and will be updated regularly.**

12.2 Complaint handling mechanisms

11. All the district and regional level offices of the line depts., viz. Horticulture, Agriculture, HPSAMB,HPMC & UHF Nauni, will designate one senior officer, in each district office, as the Grievance Redressal Officer, wherever it has not been constituted so far, who will receive any complaint relating to any matter relating to the project. The Regional or District Head of the concerned line departments will be designated as the Appellate Authority relating to the grievance redressal. The names and contact details of these officers will be published on the website of concerned agency or line department. The nature of complaints which may be envisaged to be received by the Grievance Redressal officer at the district level can be enlisted as follows:

    (i) Procurement related complaints,

(ii) Quality of material used in constructed related complaints,
(iii) Quality of construction related complaints,
(iv) Measurement of work completed related complaints,
(v) Completion Certificate related complaints,
(vi) Payment of the bill related complaints,
(vii) Quality of delivery related complaints; and
(viii) issues relating to ESMF and TDF implementation

12.3 District and Block Level Grievance Handling Arrangements

Arrangements at District and Block Level are presented below:

Table 42 Grievance Handling Arrangements

Level	Roles
First level Executive Committee of the FPO, WUA	This would be the first level of handling grievances to which any aggrieved person or complainant would report his grievance. The Committee would be responsible to maintain a grievance register that records • Number of grievances received. • discussion on grievances and minutes of the meetings, • resolution status They would also share copy of these grievances with Block Development Officer
Second level Block Level committee (headed by the BDO and comprising HEO, Social Mobilizers)	If the aggrieved person or complainant is not satisfied with the resolution provided at the first level, then he would approach the Block level committee. The Committee would be responsible to provide necessary support to resolution by appropriate liaising with relevant departments - horticulture, agriculture, irrigation, etc. It would maintain a grievance register that records • Number of grievances received. • discussion on grievances and minutes of the meetings, • resolution status
District Level Coordination Committee (as per composition provided in Section 8.1.2)	If the aggrieved person or complainant is not satisfied with the resolution provided at the above two levels, the s/he would approach the District level

Details of scope of work of these committee, their composition by district, requisite trainings, meeting procedures and processes including frequency, reporting would be detailed in the Community Operations Manual.

12.4 World Bank Grievance Redressal system

12. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures.

Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

12.5 Revision/ Modification of ESMF and TDF

As the project implementation period would be seven years, it is likely to bring changes to the operating environment with experiences gathered in application of this ESMF during implementation, besideschanges in external factors such as the legal and regulatory environment (country/state), the ESMF is

Intended to be a "live document" enabling revision, when and where necessary. Unexpected situations And/or changes in the project or sub-component design would therefore be assessed and appropriate Management measures will be incorporated by updating the ESMF to meet the requirements of applicable legislations and Bank safeguards policies. Such updating of provisions and procedures would Be undertaken, as appropriate in consultation with all implementing agencies and the World Bank. Any Changes to the ESMF & TDF will required to be cleared by the World Bank.

ANNEXURES

Annex I: Environmental Guidelines

Annex II: IPM and INM plan

Annex III: List of pesticides not permissible 132 (WHO classes IA, IB and II)

Annex IV: PEQ compliance

Annex V: Chloropicrin

Annex VI: Details on Stakeholder Consultations

Annex VII: Details on Project Interventions by District

Annex VIII: Social Impact Screening Checklist

Annex IX:Outline of TDP

Annex X:Format for recording Free, Prior and Informed Consultation

Annex XI:Monitoring indicators

Annex XII:Tribal Development Framework

Annex I Environmental Guidelines

Guidelines have been prepared for the following measures taking into account the project interventions that are linked to them. The following tables of guidelines and actions have been prepared to guide the project management unit in taking proper measures for the environmental issues and concerns during preparation, implementation and operation activities.

Table 43 Environmental Guidelines and Applicable project interventions

No #	Environmental Guideline	Applicable project Interventions	Stage of Application
1	Soil and Water Conservation	♦ Orchard management ♦ Water harvesting structures and minor irrigation scheme management	Design and Operation
2	Soil Health Management	♦ Application of Fertilizers and Organic manures ♦ Vermicompost production and application ♦ Area Expansions, replantation and rejuvenation of orchards	Design and Operation
3	Agriculture/Horticulture	♦ Integrated crop management ♦ Scientific orchard management ♦ Area Expansions, replantation and rejuvenation of orchards	Operation
4	Water Harvesting Structures	♦ New Community irrigation schemes ♦ Improvement of existing schemes ♦ Construction of water harvesting structures, check dams, small lifts ♦ Rain water harvesting ♦ Poly lined tanks ♦ Lift irrigation ♦ Water Abstraction	Design and Operation
5	Water Use	♦ Formation of WUAs ♦ Fostering and capacity building of WUAs ♦ Drip Irrigation schemes	Operation
6	Operation of FPO	♦ Storage and Handling of Inputs ♦ Common Service Centers ♦ Upgrading supply chain infrastructure ♦ Solid, Liquid Waste Management ♦ Construction of storage facilities, and installation of machinery.	Operation
7	Health and Safety Guidelines for Operational Faculties	♦ Market Yards ♦ Pack Houses ♦ CA/CS storage with Sorting Packing Grading	Operation

Table 44 Environmental Guidelines

SOIL & WATER CONSERVATION	EG SG 1.1	Levelling of crop fields and maintenance of terraces / bunds to check water runoff and soil loss.
	EG SG 1.2	Storage of surface/Rain water through water storage structures.
	EG SG 1.3	Vegetative soil conservation measures around the water engineering structures (bio-engineering measures).
	EG SG 1.4	All check dams must be below a height of 10m
	EG SG 1.5	Quarrying for stones prior to construction of any structure in a site should strictly prohibited. The engineering structures for DLT should be constructed from loose bolder/stones lying alongside the drainage line.
	EG SG 1.6	Use of stone riser technique for field bonding should be adopted as a preventing measure to check soil erosion.
	EG SG 1.7	In case any run off from higher hill slopes is damaging the bench terracing, then diversion channels need to be made at the upper portions to safely divert run off to drainage lines
SOIL HEALTH MANAGEMENT	EG SH 2.1	Check whether bio fertilizers being used is approved for use in HP by seeking guidance from District Horticulture Officer, Department of Agriculture, and Govt. Of HP who is also represented on the HP HDP Society.
	EG SH 2.2	Organic manures in the form of FYM /Compost /Vermicompost should be applied regularly to not only meet nutrient requirements of the plants but to also enhance soil biotic activity for maintaining soil health.
	EG SH 2.3	Store Bio fertilizers in cool and dry place away from heat and direct sunlight.
	EG SH 2.4	Bio fertilizers and treated seeds should not be mixed with chemical fertilizers, insecticides and pesticides.
	EG SH 2.5	Organic manures should be applied as basal dose, preferably at the time of the last ploughing and should be incorporated into the field
	EG SH 2.6	Organic manures should not be mixed with chemical fertilizers at the time of its application.
	EG SH 2.7	Crop residues & weeds not being used as fuel or fodder should be incorporated into the soil or composted.
	EG SH 2.8	Avoiding soil tillage (where possible) during times of the year when heavy rainfall events are likely
AGRICULTURE/ HORTICULTURE	EG AG 3.1	High nutritional value traditional crops should not be totally replaced by high yielding varieties.

	EG AG 3.2	To maintain biological fertility of the soil, planting of nitrogen fixing species on the crop field bunds should be done.
	EG AG 3.3	Adoption of scientific orchard management practices promoted under the project in existing orchards
	EG AG 3.4	Protected cultivation (use of polyhouse, polypit, polytrench, etc.) to reduce the chances of HYV crop failure and reduce human wildlife conflict.
	EG AG 3.5	Follow POP for management of high density planting, pollination, fertility management practices, bio control agents and bio-fertilizers.
	EG AG 3.6	Consider canopy protection using netting in fruit orchards to increase protection from heat stress, frosts and hail.
	EG AG 3.7	Encourage participation of adopter farmers in integrated crop management (ICM) demonstrations
	EG AG 3.8	To retain soil health and reduce soil contamination & water pollution, use of bio-fertilizers (bio-compost, vermicompost, organic mulch (Green manure), microbial inoculants, etc.) and bio-pesticides should be promoted.
	EG AG 3.9	Use of permissible chemical pesticides should only be done in accordance to the application timings and safety measures mentioned in IPM strategy of the project.
	EG AG 3.10	Encourage participation of adopter farmers in post-harvest management demonstrations
WATER HARVESTING	EG WH 4.1	Rain water harvesting and storage of surface water (of streams, nalla, etc.) through water storage ponds/pits should be encouraged.
	EG WH 4.2	Construction of Roof Rain Water Harvesting Tank will help to collect rain water for domestic uses and kitchen gardening.
	EG WH 4.3	Tanks/Ponds meant for storage of harvested water should be polylined and also covered suitably to avoid loss of water due to percolation and evaporation respectively.
	EG WH 4.4	Regular disinfection by chlorination and use of filters in storage structures will reduce chances of water borne diseases.
	EG WH 4.5	Proper designing, size and site selection for channel should be ensured.
	EG WH 4.6	Construction of smaller underground tanks to reduce chances of leakage.
	EG WH 4.7	Use of Ferro-cement for repairs of tanks.
	EG WH 4.8	Deep wells may not be dug to reduce drawing of underground water.
	EG WH 4.9	Do not allow runoff from cattle sheds, sullage, etc. to enter the pond or allow solid wastes into the farm pond.

	EG WH 4.10	Fish rearing to consume the mosquito eggs.
	EG WH 4.11	Rules and regulations over sharing and rational use of water to be framed by the stakeholder communities with support from NGO
	EG WH 4.12	Selection of site for community water storage tanks should be as per the convenience and cooperation of stakeholders to reduce conflicts among users.
	EG WH 4.13	Installation / lying of pipelines deep in the ground will reduce freezing of water and.
	EG WH 4.14	Compaction of the excavated soil in the dug pipelines
	EG WH 4.15	The SP and PCU in consultation with relevant line departments should develop standard designs for various water harvest, storage and recharge structures.
	EG WH 4.16	All constructions of water related structures should be based on actual site survey and conform to these designs only.
	EG WH 4.17	Top soil removed during the process of digging ponds, trenches etc. should be used to build bunds and excess soil should be spread over the rest of the farm
	EG WH 4.18	As far as possible, WHS should be sited where there are no trees. If tree cutting is unavoidable, then compensatory planting in the ratio of 1:10 should be carried out and the beneficiary group made responsible for maintaining it with at least 90% survival till 3 years.
	EG WH 4.19	Before the water is let into the pond, it should be passed through a silt filter to prevent frequent silting up of the farm pond. A simple silt filter would be a ditch that is filled with gravel and rocks through which water would flow before entering the farm pond.
	EG WH 4.20	Every farm pond should also have an outlet channel to allow excess water to flow out. This would ensure that the bunds of the farm pond are not under strain when the farm pond is overflowing
WATER USE	EG WU 5.1	Matching water availability with crop water demand
	EG WU 5.2	Compulsory use of organic mulch throughout the cropping season to minimize evaporation losses and thereby reduce water demand of crops
	EG WU 5.3	Compulsory use of micro irrigation to irrigate crops in all water regimes so as to reduce absolute quantity of water applied and also increase water use efficiency. Simple low pressure, gravity fed drip systems could be used to reduce costs to the beneficiary.
FARMER PRODUCER ORGANISATION	EG FPO 6.1	Maintain proper records of procurement and sale of pesticides specifying the brand name and name of active ingredients.
	EG FPO 7.2	Stock and promote sale of safety gear to be used while handling pesticides (for example, hand gloves, plastic masks, etc.).

	EG FPO7.3	The FPO shall not stock, sell and promote agri-chemicals indiscriminately. It shall make strong efforts to ensure that its members follow IPM and INM and accordingly shall stock and sell inputs relevant to implementing INM and IPM.
	EG FPO 7.4	If pesticides are to be sold or stocked at more than one place, take separate licenses for every such place and display the license in a prominent part of the premises that is open to public. → Do not sell pesticides in classes Ia, Ib, and II (WHO Classification of Pesticides by Hazard). → Do not sell pesticides without ISI Mark Certification. → Do not stock or sell any insecticide unless it is: properly packed, properly labelled and the package includes information leaflet (including safety guidelines). → Do not change or remove any inscription or mark made by the manufacturer on the container, label or wrapper of any pesticide.
	EG FPO 7.5	For sale of insecticides maintain a separate register showing names and addresses of all the persons to whom it has been sold or distributed and the quantities to be sold or distributed.
	EG FPO 7.6	Do not sell or store pesticide in the same building where any articles consumable by human beings or animals are manufactured, stored or exposed for sale. Store in a separate room which is well built, dry, well-lit and ventilated and of sufficient size.
	EG FPO 7.7	Acquire license to sell, stock, exhibit and distribute pesticides from the competent authority (District Agriculture Officer).
	EG FPO 7.8	Coordinate with Department of Horticulture, Agriculture and Krishi Vigyan Kendra to provide training to farmers on integrated pest and nutrient management
	EG FPO 7.9	Stock and sell bio fertilizers and organic manures such as vermicompost.
	EG FPO 7.10	Take license to sell fertilizers from the competent authority (District Agriculture Officer).
	EG FPO 7.11	Immediately after the date of expiry segregate and stamp all such stocks as 'not for sale' and keep in a separate place with clear sign displaying that it is date-expired pesticide. Dispose these stocks in an environment friendly manner.
	EG FPO 6.12	Provide soil testing and fertilizer recommendation services to member farmers
	EG FPO6.13	All the organic waste (Bark & Seed of the Fruit, Pulp of Fruit and Vegetables, Decayed Fruit) should be re-used as compost for agricultural purposes.
	EG FPO 7.14	Ensure waste produce composting or dumping areas are well away from packing and handling facilities to avoid re-contamination of harvested produce with disease, and to avoid attracting vermin to the packing facility.
	EG FPO 6.15	Prevent any nutrient rich run-off from composting sites from causing contamination of waterways (surface and groundwater).
	EG FPO 6.18	At the CSC level, water is used for washing and other purposes. Thus proper drainage system should be in place so that the greywater can be collected in a sock pit through a drainage pipe.

	EG FPO 6.19	Inorganic waste (packaging material, plastic containers) should be re-used after proper washing. The damaged and unusable canes and bottles should be sent for recycling.
	EG FPO 6.20	Production of FYM/ Compost/ Vermicompost at the farmers' level as well as the FPO level should be incorporated in the business plan
HEALTH AND SAFETY OF OPERATIONAL FACILITIES	EG HS 7.1	Cover mouth and nose with cotton cloth or mask for protection against dust and other particulate matter
	EG HS 7.2	Install fire extinguishers
	EG HS 7.3	Maintain a first aid kit at work place
	EG HS 7.4	Never exceed the maximum permissible speed and load of machine
	EG HS 7.5	Ensure that children and lay persons do not have access to sites with high speed machinery
	EG HS 7.6	Work sites must be in places where sufficient ventilation and light are available
	EG HS 7.7	Work sites must have access to safe drinking water and sanitation facilities

Project interventions not complying with the policies/regulations

Project interventions with severe environmental impacts and those not complying with the policies/regulations of state government, government of India and World Bank's safe guard policies should not be promoted under HPHDP. A list of these activities is given below:

a. Digging of irrigation tube well without taking required permission from the relevant authority will not be supported.

b. Purchase, stock, sale, distribution or exhibition of the following pesticides will not be supported:

- Pesticides classified in Class Ia, Ib and II of WHO classification;
- Pesticides banned by the Government of India;
- Pesticides banned by the State Government.
- Purchase, stock, sale, distribution or exhibition of pesticides and chemical fertilizers will not be supported without the requisite licenses.

c. No activity will be carried out in Critical or Endangered Natural Habitats

d. Construction of roads, buildings, check dams, embankments, etc., will not be supported without prior approval of the design by a qualified Engineer.

e. Embankment / check dam exceeding 10 meters in height will not be supported.

f. Activities involving direct/untreated discharge into any water body any industrial waste, sewerage or other polluting substance will not be supported.

g. Any industrial activity, effluent treatment plant will not be supported without requisite permission from the applicable Pollution Control Board.

Table 45 Likely Environmental issues in construction and their mitigation

S. No.	Likely Issues	Mitigation measures
1	Generation of noise during construction	The construction activities involving generation of¬ noise should be carried out in the daytime only and should be avoided in the night; Acoustic barriers may be used in case residential¬ area is in the immediate vicinity or classes are disturbed in the existing facility
2	Loss of top soil	Top soil excavated from the site should be carefully handled. It should be collected separately and stored as a heap which is appropriately covered. The heap should not be put in the direction of wind to avoid dust generation; Maximum effort should be made to utilize the topsoil for landscaping within the site;
3	Air pollution due to digging and levelling activities	Water sprinkling shall be practiced; Construction machinery shall be properly maintained to minimize exhaust emissions of CO, SPM and Hydrocarbons; These activities shall be avoided in very high wind and cover should be provided for loose construction material
4	Water contamination and health risks associated with setting labour camp for construction	Toilet shall be earmarked for both men and women contractual workers; Adequate drinking facilities shall be provided at the construction site; Temporary crèche facility may be provided in case of migrant labourers children residing in the camps to ensure safety
5	Air pollution due to movement of vehicles	All the vehicles entering the site to be asked to have updated PUC (Pollution under control) certificate; Sprinkling of water shall be practiced at the site
6	Land and water contamination due to vehicle movement	Proper maintenance of vehicle shall be ensured out to avoid any leakage of oil or grease.
7	Safety issues due to vehicle movement at the site	Vehicle speed is to be restricted to 15km/hour at site; Provision of adequate personal protective equipment like safety helmets, face masks, safety shoes, safety goggles etc. for the safety of workers
8	Air pollution due to use of D.G set	D.G set to be optimally used with proper orientation and adequate stack height; Stack monitoring carried out on regular basis; Proper maintenance of the DG Set should be carried out on regular basis;

		Acoustic enclosures are to be provided with the D.G sets to minimize the noise levels
9	Land and water contamination due to waste generated at site	Waste shall be stored at designated place after segregation on the basis of category (hazardous and non-hazardous); Hazardous waste shall be disposed of to the authorized vendors only.
10	Issues like child labour during construction at site	Provision of clause in contractor's agreement that bans child labour and forced labour at project site. Adequate procedures to avoid or prevent hiring/entry of child labour at the project site

Annex II: IPM Strategy

Introduction and Background

During the project span of seven years the pesticide usage would increase, hence, this document has been prepared as a guidance for integrated pestmanagement. IPM combines specific cultural, chemical, and horticultural needs of a particular crop to develop a broad-based approach to controlling the pests. Given the obvious importance of chemical pesticides in controlling pests and thereby managing better productivity and also given the clearly adverse impacts of its excessive use, the HPHDP has adopted Integrated Pest Management (IPM) as the key strategy to combat pests and diseases in the project.

Till recently, great emphasis was laid on application of chemical pesticides, which initially proved beneficial, but after continuous and indiscriminate use, it lead to some adverse impacts as summarized below:

- Development of resistance in target insects/pests and they are no longer eliminated with recommended doses.
- Destruction of useful insects that were natural predators of problem-insects due to continuous use of chemical insecticides
- Pollution of soil and water sources resulting in reduced soil productivity
- Deposition of pesticide residues in the environment that ultimately enters the human food chain
- Secondary outbreak of pests due to loss of natural enemies

IPM is a broad ecological approach of pest control (insects, diseases, weeds, rodents etc.) employing all methods and techniques viz. cultural, mechanical, genetical, regulatory, biological and chemical in a compatible manner to keep pest population below economic threshold level (ETL) and also reduces the residual effects of chemicals on both plants and animals. The project will greatly benefit with the implementation of IPM but will require a strategy for awareness, training and monitoring to support its implementation.

Objectives of Integrated Pest Management Plan

The purpose of this document is to describe a Plan by which the project can promote and support safe, effective and environmentally sound pest management in horticultural interventions undertaken under HP-HDP. The Plan promotes the use of biological and environmental control methods and the reduction in reliance on synthetic chemical pesticides.

1. Maximize production& minimize inputs
2. Minimize environmental pollution
3. Manage pests below ETL through bio-control involving release of indigenous natural enemies of pests
4. Minimize occupational health hazards due to chemical pesticides.
5. Preserve ecosystem and maintain ecological equilibrium.
6. No or less use of chemical pesticides for minimum pesticide residues.

Replacement of agricultural chemicals by substituting with biological inputs (bio fertilizers, FYM, vermi-compost, bio-agents, bio-pesticides etc.)Integrated Pest Management is the approach now being adopted world-wide to address the issue of excessive use of chemical pesticides in agriculture. The World Bank's Operational Policy 4.09 defines integrated pest management as a mix of farmer-driven, ecologically based pest control practices that seeks to reduce reliance on synthetic chemical pesticides. It involves managing pests (keeping them below economically damaging levels) rather than seeking to eradicate them.

- Relying, to the extent possible, on non-chemical measures to keep pest populations low and
- Selecting and applying pesticides, when they have to be used, in a way that minimizes adverse effects on beneficial organisms, humans, and the environment.

The World Bank Operational Guidelines

The World Bank & IFC Pesticide guidelines aims to ensure that the pesticide

- Must have negligible adverse human health effects
- Should be effective against target pests and minimal effect on non-target species
- Development of pest resistance to be kept in view
- Public health pesticides must be safe for inhabitants and animals

Integrated pesticide management specifically identifies the following as the key in pest control.

- A categorical preference for bio control methods along with institutional and capacity building for the same.
- Reducing reliance on synthetic chemical pesticides and only if approved by IPM approach.
- Does not permit under any circumstance the use IA, IB and II classified pesticides. Listing of these chemicals and provided by the World Health Organization is given at the end of the report.
- Recommends the use of Participatory IPM along with specific investment components for the same.
- Permits category III type chemicals and these are listed at the end of the report. But even these must be used as part of the IPM strategy. Not all chemical l Pesticides if it is likely to be used without training and safety.

6.5.3 IPM Tools

- Identification of pests & diseases for the crop in the area
- Assessment of ETL for major pests/diseases
- Cultural methods
- Physical/ mechanical methods
- Biological methods
- Bio-pesticides
- Chemical methods (preferably use chemicals that are less toxic and have a shorter life after application)

The IPM process starts with monitoring, which includes inspection and identification, followed by the establishment of economic injury levels. The economic injury levels set the economic threshold level. That is the point when pest damage (and the benefits of treating the pest) exceed the cost of treatment. Crop monitoring, that keeps track of the pests and their potential damage, is the foundation of IPM. This provides knowledge about the current pests and crop situation and is helpful in selecting the best possible combinations of the pest management methods. Identification of minor and major pests, diseases in the project areas has been conducted and depicted in the table below.

Table 46 Important Diseases of fruits of HP

S. No.	Name of fruit crop	Important pests	Important diseases
1	Pome fruit (Apple & Pear)	San Jose Scale, Woolly apple Aphid, European Red Spider Mite (*Panonychus ulmi)* Two-spotted spider mite *(Tetranychus urticae)*, Blossom Thrips (*Thrips flavus)*, Apple root borer (*Dorysthenus hugelii)* Stem borer *(Apriona cinerea,* Defoliating beetles, Leaf roller (*Archips spp.),* Tent caterpillar (*Malacosoma indicum),* Defoliating caterpillar (Zagaena moth, Indian Gypsy moth),etc.	Apple Scab (*Venturia inaequalis),* Powdery mildew (*Podosphaera leucotricha),* Pre mature leaf fall *(Marsonina coronaria*), Canker disease complex – Smoky Blight (*Sphaeropsis malorum),* Pink canker (*Corticium salmonicolor),* Stem Canker (*Botryosphaeria dothidea),* Stem Black (*Coniothecium chomatosporium),* Nail Head canker (*Nummularia discrete),* Silver Leaf canker (*Chondrostereum purpureum),* White root rot (*Dematophora necatrix),* Collar rot (*Phytophthora cactorum,* Crown gall (*Agrobacterium tumefaciens),* Hairy roots (*A. Rhizogenes), etc*
2	Stone fruits (Peach, Plum, Almond, Apricot, Cherry)	Peach leaf curl aphid (*Brachycaudus helichrysi),* Green Peach Aphid (*Myzus persicae),* peach fruit fly (*Bactrocera zonata,* Plum fruit moth (*Cydia funebrana),*	Bacterial gummosis (*Pseudomonans spp.),* Peach leaf curl (*Taphrina deformans),* Brown rot & Blossom Blight (*Monilinia laxa,* Leaf spot of cherry (*Cercospora circumscissa),* Powdery mildew of plum (*Podosphaera oxycanthae),* Powdery mildew of peach & Apricot (*Sphaerotheca panosa),* Stigmina Blight of peach and apricot (*Stigmina carpophylla*), White root rot (*Dematophora necatrix),* Bacterial leaf spot and gummosis of Almond (*Xanthomonas compestris),* Shot hole (*Cedrcospora spp),Peach X disease, etc*
3	Walnut	Walnut weevil (*Polydrusus mollis)*	Blotch (*Gnomonia leptostyla),* Die Back (*Glomerella cingulata),* Powdery mildew (*Phyllactinia roborish)*
4	Pomegranate	Anar Butterfly (V*irchola isocrates)*	Canker (*Ceuthospora phyllosticta)*
5	Citrus fruits	Citrus psylla (*Diaphorina citri),* White Fly (*Dialeurodes citri),* Citrus leaf minor (*Phyllocnistis citrella),* Citrus butterfly (*Papilio demoleus),* Citrus nematodes (*Tylenchulus*	Canker (*Xanthomonas compestris pv. Citri),* Die Back (*Colletotrichum gloeosporoides),* Gummosis (*phytophthora spp.),* Citrus decline (Disease complex involving nutritional disorders, infection with fungi, virus MLOs and nematodes), Fruit rot

		semipenetrans, Radopholus similis)	(*Penicillium italicum, P, digitatum)*
6	Mango	Mango hopper (*Amirtodus atkinsoni),* Mango mealy bug (*Drosicha mangiferae),* Mango stem borer (*Bactocera rufomaculata,* Fruit Fly *(Ceratitis cosyra)*	Anthracnose (*Colletotrichum gloeosporioides,* Powdery Mildew (*Oidium Mangiferae),* Mango Malformation (*Fusarium moniliformae),* Mango Die back (*Botryodiplodia theobromae)*
7	Litchi	Red Rust mite (*Acerialitchi)*	

Source: Horticulture University, Nauni, Solan

Table 47 ***Disease and pest of flowers and vegetables in HP***

S. No.	Target Crops	Target disease	Target Insect-Pest
	Vegetable		
1.	Tomato	Early blight (*Alternaria solani*) Late blight (*Phytophthora infestance*) Bacterial spots (*Xanthomonas euvesicatoria)*	Fruit borer (*Helicoverpa armigera*)
2.	Capsicum	Virus complex Anthracnose (*Collectrichum capsici*) Powdery Mildew (*Leveillula taurica*)	Aphids Fruit Borer (*Helicoverpa armigera*)
	Flowers		
1.	Chrysanthemum	Septoria leaf blight (*Septoria obese* and *S. chrysanthemella*) Alternaria (*Alternaria* sp.)	Chrysanthemum aphids (*Macrosiphoniella sanborni*) Two-Spotted Spider Mites (*Tetranychus urticae*)
2.	Marigold	Alternaria leaf spots (*Alternaria* sp.) Powdery Mildew (*Leveillula taurica*)	Two Spotted Spider Mites (*Tetranychus urticae*) Green peach aphids (*Myzus persicae*)

Source: Horticulture University, Nauni, Solan

Assessment of Economic Threshold Level: This is based on the concept that most plants can tolerate at least some pest damage. In an IPM programme where the economic threshold is known, chemical controls are applied only when the pest's damaging capacity is approaching the threshold, despite application of other alternative management practices.The level of pest population is very important consideration for taking up control measures. Pest population must be maintained at levels below those causing economic injury. The economic threshold is the pest density at which control measures should be determined to prevent an increasing pest population from reaching economic injury level. The determination of these thresholds is a pre-requisite to the development of any pest management strategy.

Priority wise various control methods of IPM has been described in the following tabular form:

Procedure	How it will be done	Remarks
Biological	Conservation of all natural enemies & bio agents of all the harmful insect & pests e.g. Birds, Parasites & pathogens, As these	First and Prime priority will be of biological method of IPM.

Procedure	How it will be done	Remarks
	are farmer's friend, therefore all these are to be conserved.	
Cultural	• Avoidance of monoculture in large belts • Improved disease resistant varieties. • Summer ploughing. • Optimum plant densities. • Avoiding excessive irrigation. • Avoiding high nitrogenous fertilization. • Trap crops	
Mechanical	• Damage/Destroy all the eggs of the insect. • Destroy any material infested by insect, pest and diseases.	Second priority
Chemical	• If the loss is beyond ETL then only we will go for chemical control, and here only safe chemicals will be used.	This will be only last and ultimate priority and only, if crop loss is beyond ETL.

Bio-control methods: Control of insect pests and diseases through biological means is one of the most important components of IPM. In broadest sense, bio-control is use of living organisms to control unwanted living organisms (pests). In other words deliberate use of parasites, predators and pathogens to maintain pest population at a level below those causing economic losses either by introducing a new species into the environment or by increasing the effectiveness of those already present. The different types of bio-control practices are grouped as under:

1. **Introduction:** In this process a new species of bio-agent is introduced to a locality for its establishment against its host. Introduction is made only after laboratory examination and field trials for its efficiency.

2. **Augmentation:** In this process the population of natural enemies already present in an area is increased by releasing either laboratory reared or field collected bio-agents of same species in such number as would require to suppress the population in that area.

3. **Conservation:** This is the most important component of biological control and plays a major role in pest suppression. In this process natural enemies already present in the nature are protected from being hilled. The different practices required to protect the natural enemies are listed below:

   (i) Collection of egg masses and placing them in bamboo cage-cum-bird percher for allowing emergence of parasites and withholding of pest larvae.
   (ii) Educating farmers through field days, radios & T.V. to differentiate pests and defenders and sparing the defenders during field spray.
   (iii) Chemical spray should be adopted as last resort and that too after observing pest defender ratios and economic threshold level (ETL).
   (iv) Use of broad spectrum pesticides should be avoided.
   (v) Use of selective and relatively environmental friendly (REF) pesticides.
   (vi) Strip or spot application of pesticides.
   (vii) Growing trap crop on the borders of main fields before the actual sowing of a crop to trap pest and develop natural enemies.
   (viii) Augmentation of crop defenders by release of egg and larval parasites andPredators
   (ix) Root dip/seedling treatment for gall midge prone area.

(x) Crop rotation and inter-cropping also help in conservation of defenders.
(xi) User recommended dose and concentration of pesticides.

Use of Botanical Pesticides: These can be prepared in various ways. They can be as simple as raw crushed plant leaves, extracts of plant parts or as complex as chemicals purified from the plants. Pyrethrum, neem, tobacco, garlic, and pongamia formulations are some examples of botanicals. Some botanicals are broad- spectrum pesticides. Botanicals are generally less harmful to the environment, because of their quick degrading property. They are less hazardous to transport. The major advantage is that these can be formulated on-farm by the farmers themselves.

Cultural Methods: Cultural methods of pest control consist of regular farm operations so performed, which either destroy the pests or prevent them from causing economic losses. These practices have been used since long for pest control and needs thorough knowledge of crop production, biology and ecology of pests and their natural enemies. The various cultural practices can be grouped under the following heads:

- Preparation of nurseries or main fields free from pest infestation e.g. removal of plant debris, trimming of bunds, treating of soil and deep summer ploughing which kill various stages of insects.
- Testing of soil deficiencies for micronutrients on the basis of which fertilizers Should be applied.
- Selection of clean and certified seeds and treating of seeds before sowing for Seed borne diseases.
- Selection of seeds of relatively past resistant/tolerant varieties. These resistant/tolerant varieties play a significant role in past suppression and thus avoid considerable economic losses arising out of pest attack. Many of such crop varieties have been released / are being released.
- Crop rotation also plays an important role in pest suppression.
- Synchronized sowing and proper plant spacing.
- Optimum use of fertilizers at appropriate time. It is well-known fact that highdoses of Nitrogen fertilizers increase pest incidence.
- Proper water management (alternative wetting and drying to avoid waterstagnation).
- Harvesting as close as to ground level.
- Proper weed management. It is well-known fact that the weeds besides competing with crop for micronutrients also harbour many pests.
- Educate farmers with the ecology of crops and pests for adjusting of time of sowing and harvesting to escape peak season of pest attack. Explore and use traditional knowledge banks (old farmers) in the villages.

Mechanical and physical methods: In this process manual labour is involved where we also take the help of some tools. Various practices involved are grouped as under:

- Collection of egg masses, larvae, pupae and adults where possible and either destroy them or place them in cage-cum-bird pushers for conservation of natural enemies and withholding of pest species.
- Removal and destruction of diseased or pest infested portion of plant parts.

- Use of rope in rice crop before flowering for dislodging larvae of bests e.g. caseworm and leaf folder.
- Use of light traps and destruction of trapped pests.
- Use of pheromone traps for monitoring and suppression of pest population.

Regulatory methods: Rules formed by various agencies and Government are implemented under this method. Quarantine rules are enforced strictly disallowing infected materials to be imported and transported to other parts where there is no pest problem. Ban on certain dangerous chemicals is also enforced and regulated.

Table 48 list of relatively environment friendly pesticides and insecticides

(i) Insecticides: Endosulfan, Monocrotophos, Phosphamidon, Phosalone, Malathion, Exydemeton methyl, Carbofuran (for soil application).
(ii) Fungicides: Copper oxycholoride, Carbendaxim, Mancoseb, Thiram, Streptocycline.
(iii) Weedicides: Anilofos, Pendimethalin, Thiobencarb, Butachlor, Oxyfluorfan, 2,4 – D.
(iv) Rodenticide: Zinc phosphide, Bromodiolone.
(v) New introductions: Neem based insecticides, such as, Neem oil based emulsion containing 0.9% azadirachitin, Neem kernol based emulsion containing 0.15% Asadirachtin.

Chemical methods: Use of chemical pesticides is the last resort when other methods fail to keep the pest population below economic threshold level (ETL). Although there is advancement in pest management research, pesticides would continue to play an important role in crop protection. Therefore, use of pesticides should be judicious, based on pest surveillance and ETL to minimize not only the cost but also reduce the associated problems. While going for chemical control the following points must be strictly followed:

- Economic threshold level should be observed.
- Selection of relatively environmental friendly pesticides.
- Ensure that farmers are sensitized to the use and safe disposal of insecticides, fertilizers etc. and that these harmful chemicals are not used beyond their expiry.
- If the pest is present in strips or in isolated patches, whole field should not be sprayed.
- Pest and defender ratio must be observed. If ratio is 1:1, there is no need of pesticide spray.

Where chemical pesticides are deemed essential to control pest attack, the project shall ensure that pesticides procured or used in the project are not on the list of pesticides banned by GoI or belong to Classes Ia, Ib or II of the WHO classification of pesticides (See Annex III)

IPM implementation in HPHDP

Awareness creation: This is an essential component in the IPM that includes, Manuals, pamphlets, brochure, and Farmers discussions to create awareness about IPM in each of the clusters in HPHDP. In addition, IPM is more effective when coupled with INM and appropriate irrigation management. Therefore, the project would provide support and help the farmer groups /Farmer Producer Company to

source required inputs such as bio fertilizers, biocontrol agents, bio pesticides, etc. guidelines for soil nutrient management have been provided in section
Strategy for Soil and Nutrient Management

Pamphlets and posters on safe use of pesticides which deal from purchase, transport, storage, application to disposal must be provided to the farmers. All supports to pesticide sprayers and equipment must include making available a protective gear.A major impact of pesticide usage is on water. Hence, reducing pesticide usage by adopting IPM/NPM and permitting only class III pesticides, while substantially reducing pesticide usage, the threat to water contamination reduction is possible. Educating the community not to spray pesticides during or just before a rain must be included in the awareness material.

Capacity Building and Training: In order to train a large no. of farmers, training of trainers will be carried out which would cover Horticulture Extension Officers, project implementation units, service providers who in turn would train adopter farmers in the clusters. Each cluster would have a Lead Farmer on whose plot the entire package of practices including IPM would be demonstrated. Groups of about 20-30 farmers (both men and women) would be attached to each such Lead Farmer and his/her plot for meeting regularly and learning by observation and experimentation.

Monitoring: The project will also evaluate the impact of adopting IPM approaches, such as relationship between climate and pest incidence, application of pesticide vis-a-vis pollination and extent of pest attack and economic damage, and evaluate the success of the package of practices, including IPM. Training, demonstrations, etc., for implementing IPM has been provided in the ESMF budget. A number of the monitoring indicators covering both adoption as well as knowledge of IPM among P farmers will be assessed periodically as part of internal monitoring, external E &S audit as well supervision missions from the World Bank.

The focus of monitoring and evaluation will be to assess the buildup of IPM capacity in the Farmer Producer Groups and the extent to which IPM techniques are being adopted in production, and the economic benefits that farmers derive by adopting IPM. It is also crucial to evaluate the prevailing trends in the benefits of reducing pesticide distribution, application and misuse.

Table 47 Monitoring activities IPM

	Activity	**Responsibility**	**Methodology**	**Time/frequency**
1	Whether IPM package including relevant literature, pamphlets and banned list of pesticides has been circulated to all farmers	Horticulture Department, District PIU and SP	Check if the material has been circulated to all adopter farmers.	Periodic field visits to the clusters
2	Purchase/Selection of Pesticides	Horticulture Department, District PIU and SP	Where are pesticides being purchased from and in what quantity and are they in line with the IPM guidelines Provide, as required, available bio-control agents	Periodic field visits to the clusters
3	Use of Bio-fertilizers and vermicompost	Horticulture Department, District	Organize awareness camps in villages on latest technology	Periodic visits and consultations with

		PIU and SP	in organic farming, and vermicomposting Monitor availability and production of vermi-compost, as absence may diminish interest	adopter farmers and FPO.
4	Training and awareness creation	PCU, Horticulture Department, District PIU and SP	Organize at least one linkage workshop every year. This would be critical to sustain IPM approaches Beyond the project period. Training of Agri/Hort staff (project and line department) in IPM	A constant monitoring of training and exposure visits

Pest and Disease Surveillance

As part of IPM strategy, a pest surveillance will be undertaken electronically. Pest surveillance is an effective tool as an information system, which renders all pest control methods more effective. It aims at monitoring and forewarning of likely buildup of pests in order to facilitate planning and adoption of suitable control strategy based on ETL. In other words pest surveillance acts as a guiding principle in determining the areas and time needing the pest control.

Table 48 IPM Strategy Year Wise Strategy

Activity	Years										Action Points
	1		2		3		4		5		
Training of Hort staff (project and line department) in IPM											Train at recognized national/state institutions and state universities
Training of Facilitators/ and Service providers in IPM											Will be useful for inclusion and orientation of women stakeholders in IPM approaches, as they are the main agricultural workers.
Developing relevant literature and pamphlets for distribution with list of banned chemicals (update lists as required)											Should be in local language and appealing visually. Distribute these during demonstrations at clusters and awareness camps.
Awareness camps for farmers											Organize awareness camps in villages on latest technology in vermi compost production, IPM concept, safe use, handling and disposal of insecticides/pesticides, identification and distinction between predators and pests.
Provide technical inputs and support to identified farmers and later use them as models for replication by other interested farmers											Arrange inputs in form of bio-pesticides, bio-weedicides, bio-fungicides, bio-fertilizers, bio-control agents (predators) etc. Converge with relevant departments of Agriculture, Livestock and Horticultural for this purpose
Develop and distribute guidelines on safe use of pesticides/insecticides											Emphasize avoiding use of broad-spectrum pesticides, chemicals that wipe out useful insects etc. Use recommended dose and concentration of pesticides. Do not support sale and use of banned

Activity	Years					Action Points
	1	2	3	4	5	
						fertilizers, pesticides, insecticides etc.
Conduct bench-mark survey and prepare checklist of pests/pathogens						Use local research institutions, agricultural universities and extension system workers for identifying major area-specific pests
Training and Tie-up for supply of vermi-compost						Will be required for farmers to immediately switch over to bio-fertilizers, as absence may diminish interest
Legume plantations in farm bunds and fields, promoting use of mulch, setting up of vermi-compost units						Link with other arable land development programmes. Plantations be raised simultaneously with vermi-compost units so that increase in productivity can be seen in fields. Long-term availability of vermi-compost is needed to sustain IPM
Set up demonstration plots						Set up demonstration plots once farmer awareness and training has initiated and after setting up of vermin-compost units. This will reduce delays in adopting IPM and will lead to quick results encouraging others to follow suit
Introduce and provide readily available IPM packages						Available IPM packages be provided to farmers for immediate adoption.
Provide, as required, available bio-control agents						Use existing provisions of line departments or state bio-control labs for this purpose.
Introduce vermicomposting						Organize training and exposure visits, and conduct trainings on vermicompost production
Document progress						Record changes in inputs and outputs and develop economic gains table for popularizing it among farming community

Constraints in Implementing IPM

Despite the plans for implementing IPM, several constraints exist. The table below summarizes the constraints in promoting IPM on a large scale.

Table 49 Constraints in implementing IPM

Constraint/Risks	Mitigation
Availability of selective pesticides, effective against crop pests but not against natural enemies of pests, is a problem.	Make available selective bio-pesticides to farmers, as per their requirements.
One of the basic points of IPM is ETL, which have not been worked out for all the pests and combination of pests for different varieties and regions.	Support participatory research programs with farmers and research organizations to work out ETL for various pests within different project districts
Potential of bio-control agents has not been evaluated fully for many agents.	Do not introduce bio-control agents that have not been worked out in detail and are still in study stage. Use only ready to release and duly approved bio-control agents.
Techniques of mass rearing of several bio-agents are still not well developed.	Ensure timely breeding and supply of predators to farmers; improve linkages with relevant line departments and other institutions.
Farmers in many cases are aware of new technologies but are unable to access it leading to disillusionment and consequently non-adoption of the technology.	Ensure that demonstrations are alongside awareness building and that there is no gap between demonstration and supply of new technology, lest people lose interest.

Lack of adequate trained manpower at the field level to work with farmers to help them learn IPM.	Ensure that a cadre of IPM resource persons are created in every cluster, especially in the SP2 teams. Ensure that regular trainings and refresher courses are conducted for IPM resource persons before the beginning of each crop season. Organizations such as Agri Man Ecology (AME) Foundation, PRADAN, FES, ASA may be contacted to develop appropriate training manuals for promoting IPM through FFS approach.

Criteria for Pesticide Selection and Use

The procurement of any pesticide in a Bank financed project is contingent on an assessment of the nature and degree of associated risks, taking into account the proposed use and the intended users. With respect to the classification of pesticides and their specific formulations, in reference to the World Health Organization's Recommended Classification of Pesticides by Hazard and Guidelines to Classification. The following criteria apply to the selection and use of pesticides in,

- They must have negligible adverse human health effects.
- They must be shown to be effective against the target species.
- They must have minimal effect on non-target species and the natural environment.

Pesticide Storage, Handling and Disposal

Exposure to pesticides may occur when handling and spraying pesticides. The exposures to pesticides may occur in following situations:

- When handling the pesticides product during opening of the package, mixing and preparation of the spray.
- When spraying the pesticides.
- When disposing the pesticides solution and containers General precautions:
    1. The operator should also wear a protective hat and face shield or goggles.
    2. Do not eat, drink or smoke while working.
    3. Wash hands and face with soap and water after spraying and before eating, smoking or drinking.
    4. Shower or bath at the end of every day's work and wear new clean clothes.
    5. Wash overalls and other protective clothing at the end of every working day in soap and water and keep them separate from the rest of the family's clothes.
    6. If the insecticide touches the skin, wash off immediately with soap and water.

7. Change clothes immediately if they become contaminated with pesticides. Inform the supervisor immediately if one feels unwell.

Protective Clothing and Equipment

Absorption of pesticides occurs mainly through the skin, lungs and mouth. Specific protective clothing and equipment given below must be worn in accordance with the safety instructions on the product label.

- Broad-rimmed hat (protects head, face and neck from spray droplets).
- Face-shield or goggles (protects face and eyes against spray fall-out).
- Face mask (protects nose and mouth from airborne particles).
- Long-sleeved overalls (worn outside of boots).
- Rubber gloves.
- Boots

Storage

1. Pesticides storehouses must be located away from areas where people or animals are housed and away from water sources, wells, and canals.
2. They should be located on high ground and fenced, with access only for authorized persons. However, there should be easy access for pesticides delivery vehicles and, ideally access on at least three sides of the building for fire-fighting vehicles and equipment in case of emergency.
3. Pesticides must NOT be kept where they would be exposed to sunlight, water, or moisture which could affect their stability.
4. Storehouses should be secure and well ventilated.
5. Containers, bags or boxes should be well stacked to avoid possibility of spillage. The principle of first expiry first out should be followed.
6. Stock and issue registers should be kept up to date. Access to the pesticides should be limited to authorized personnel only.
7. The store room should have a prominently displayed mark of caution used for poisonous or hazardous substances. It should be kept locked.
8. Containers should be arranged to minimize handling and thus avoid mechanical damage which could give rise to leaks. Containers and cartons should be stacked safely, with the height of stacks limited to ensure stability.

Transportation

1. Pesticides should be transported in well-sealed and labelled containers, boxes or bags.
2. Pesticides should be transported separately. It should NOT be transported in the same vehicle as items such as agricultural produce, food, clothing, drugs, toys, and cosmetics that could become hazardous if contaminated.
3. Pesticides containers should be loaded in such a way that they will not be damaged during transport, their labels will not be rubbed off and they will not shift and fall off the transport vehicle onto rough road surfaces.
4. Vehicles transporting pesticides should carry prominently displayed warning notices.
5. The pesticides load should be checked at intervals during transportation, and any leaks, spills, or other contamination should be cleaned up immediately using accepted standard procedures. In the event of leakage while the transport vehicle is moving, the vehicle should be brought to a halt immediately so that the leak can be stopped and the leaked product cleaned up. Containers should be inspected upon arrival at the receiving station. There should be official reports to the

national level and follow-up enquiries in the event of fires, spills, poisonings, and other hazardous events.

Disposal of remains of pesticides and empty packaging

i. At the end of the day's work, the inside of the spray pump should be washed and any residual pesticides should be flushed from the lance and nozzle.
ii. The rinsing water should be collected and carefully contained in clearly marked drums with a tightly fitted lid. This should be used to dilute the next day's tank loads or disposed properly by the supervisor at disposal sites like pits or digs.
iii. Never pour the remaining pesticides into rivers, pools or drinking-water sources.
iv. Decontaminate containers where possible. For glass, plastic or metal containers this can be achieved by triple rinsing, i.e. part-filling the empty container with water three times and emptying into a bucket or sprayer for the next application.
v. All empty packaging should be returned to the supervisor for safe disposal according to national guidelines.
vi. Never re-use empty insecticide containers.
vii. It shall be the duty of manufacturers, formulators of pesticides and operators to dispose packages or surplus materials and washing in a safe manner so as to prevent environmental or water pollution.
viii. The used packages shall not be left outside to prevent their re-use.
ix. The packages shall be broken and buried away from habitation.

Disposal of Expired Pesticides

i. Adequate measures should be undertaken to avoid expiry of stocks in storehouses.
ii. First Expiry First Out principle should be strictly followed during stock movements.
iii. The expired stock should be returned to manufacturer for disposal as per guidelines preferably through incineration process.
iv. The chemical efficacy should be tested before disposal of expired pesticides to find out possibility of usage. The efficacy and active ingredient percentage of pesticides is tested and certified by the authorized testing laboratory.

Health Monitoring

1. In case of accidental exposures or appearances of symptoms of poisoning, medical advice must be sought immediately.

In case of organ-phosphorus (Malathion), regular monitoring of cholinesterase (CHE) level should be carried out and spray men showing decline in CHE to 50% should be withdrawn and given rest and if needed medical aid.Strengthening of Bio Control laboratories of Department of Horticulture (Rajhana):-

Department of Horticulture, Himachal Pradesh established State Biological Control Laboratory during the year 2002 as a step forward for the adoption and promotion of Integrated Pest Management with the objectives of mass multiplication of Bio Control agents, their conservation and to minimize the indiscriminate and non-judicious use of pesticides by imparting technical know how about various IPM

approaches among the fruit growers of the state. In Departmental Lab, multiplication and release of Bio-agents like C*hrysoperla* sp., *Tricogrammachilonis, Trichogramma pretiosum, Trichogramma embryophagumAphytis* sp.and *Aphelinus mali* which are being used against pests of apple, peach, mango, pomegranate etc., is already in process. These Bio-agents are being multiplied *in-vitro* and in polyhouse.

Most of the facilities have already been created in the laboratory for multiplication of above mentioned Bio-agents. With the addition of some inputs in already present facilities, some more number of Bio-agents, Bio-pesticides and Bio fertilizers could be produced and production capacity of the laboratory could be increased manifold. This will help in bringing more and more area of fruit, vegetable and flower crops under organic farming

Potential Bioagents/ bioproducts to be prepared in the laboratory

Trichogramma chilonis,T. embryophagum,T. pretiosum,Chrysoperla carnea Aphytis sp. Proclia group,*Encarsia* sp.,*Chilocorus infernalis, Aphelinus mali, Cryptolaemus montrouzieri,Trichoderma* spp, Nuclear polyhedrosis virus, *Bacillus thuringiensis,Beauveria bassiana,*Pheromone lure

Bio-control agents/Bio-pesticides to be multiplied/ produced in the laboratory

Bio- control agent	Capacity per year	Area to be covered
Trichgramma cards	200,00 cards per year	3,000ha
Chrysopid Adults	300,00 per year	1800ha
Cryptolaemus beetles	100,000 beetles per year	40-60ha
Aphytis sp./Encarsia sp.	200,000,00 per year	160ha
Chilocorus beetles	100,000 per year	40ha
Aphelinus mali	500,000,00 per year	500ha
Trichoderma fungi	2000 kg	400-500ha
Pheromone lure	2000	200ha
NPV	2000lt	2000ha
Bt	2000kg	1000ha
Beauveria bassiana	2000kgs	

Funds required for the unit size of the model in brief are given below:

S.N.	Particulars of Expenditure	Size/Unit	Amount (Rs in lakhs.)
1	Two buildings are required(one for predators, parasites and other for fungal and viral based products) (one building is available) another building of 400 m^{2} is **required**	**400 sq.mt.**	**1,00.00**
2	**Poly-house required (1000 sq.mt.) One polyhouse of 100 sq. mt. available, Additional area of Poly-house (900 sqmt.)**	**900 sq.mt.**	**9.00**
3	**Electricity etc.(Transformer)**		**7.00**
4	**Water harvesting structure**		**1.00**
5	**Vermin Compost Unit**		**0.50**

6	**Laboratory Equipments**		**0.50**
	Total funds required		**219.00**

Strategy for Soil and Nutrient Management

Maintaining and Improving Soil Structure

Compaction of topsoil due to farm mechanization or any other reason results in reduced soil productivity. Efforts would be required to minimize soil compaction by regularly educating the farmers and holding farmer camps. Good soil management practices, as listed below should be shared with the farmers for adoption:

(i) No tillage or zero tillage technique to be used for ploughing or sub-soiling; ICAR guidelines should be followed for this.
(ii) Prevent livestock grazing on farm when soils are wet to prevent damage to soil structure.
(iii) Encourage regular cultivation on free-draining soils.

Preventing soil erosion

Soil erosion also leads to reduced land productivity and could takes place due to changes in cropping pattern and management, farm mechanization, overgrazing by livestock and rainfall. Farmer education and awareness building would be required to prevent and/or minimize soil erosion by holding farmer camps. Some of the soil erosion control measures that could be adopted by farmers include:

(i) Maintaining organic matter: Organic matter and microorganisms acts as cement in binding small soil particles into aggregates. Good amount of soil organic matter has larger soil aggregates that resist erosion.
(ii) Maintaining of crop residue cover: Crop residue cover on uncultivated fields helps prevent erosion and also adds to soil productivity. It prevents direct soil erosion due to rain action and also retards flow velocity of runoff, which again reduces incidences of erosion and allows soils to absorb more water.
(iii) Reduce tillage: Reduced and minimum tillage systems leave a good soil residue cover to prevent erosion and conserve soil moisture.

Selecting fertilizers appropriately and applying optimally.

Excess application of fertilizers also results in loss of soil productivity. Timing, technique, dose and type of fertilizer are very critical in getting best results and maintaining soil nutrient profile. Farmer education through local language brochures, farmer camps etc would be required to ensure proper use of fertilizers. Farmers should be encouraged to adopt good practices some of which are listed below:

(i) Nutrient deficiency signs on growing crops should be carefully observed for finalizing the type and dose of fertilizers.
(ii) Farmers should be encouraged to get the soils tested and analyzed at accredited laboratories to determine the nutrient profile and therefore type and dose of fertilizers.
(iii) Farmers should be encouraged to learn about different fertilizer application techniques, like broadcasting, row/band placement, top dressing, side dressing, foliar application etc and then choose the most relevant technique.Farmers should be encouraged to use bio-fertilizers, vermi-compost and farm yard manure.
(iv) To maintain natural productivity, green manure crops could be grown during fallow season.

Annexure III List of Pesticides banned and permissible under the project

Aldrin	Benzene Hexa Chloride (BHC)
Calcium Cyanide	Chlordane
Copper acetoarbenite	Dibromocworopropane (DBCP)
Endrin	Ethyl Mercury Chloride
Ethyl parathion	Heptachlor
Manzona	Methomyl 24% Formulation
Nicotine Sulphate	Nitrofen
Paraquate dimethyl sulphate	Penta Choloro nitrobenzene
Penta cholorophenol (PCP)	Phenyl Mercury Acetate (PMA)
Sodium Methane Arsonate (MSMA)	Tetradifon
Toxaphene	Phosohamidon 85% SL
Methomyl 12.5% L	Aldicarb
Chlorbenzilate	Deildrin
Ethyl dibromide (EDB)	Maleic Hydrazide
Trichloro Acetic Acid (TCA)	Aluminium phosphamide
Carbofuran 505 WP	Captafal 80%
Malathian 25 DP & 50% EC	Methoxy ethyl mertcury chloride (MECE)

Extremely hazardous (Class Ia) technical grade active ingredients of pesticides (common name) not permissible in the project

Aldicarb	Difethialone	Parathion-methyl
Brodifacoum	Diphacinone	Phenylmercury acetate
Bromadiolone	Disulfoton	Phorate
Bromethalin	Ethoprophos	Phosphamidon
Calcium cyanide	Flocoumafen	Sodium fluroacetate
Captafol	Fonofos	Sulfotep
Chlorethoxyfos	Hexzchlorobenzene	Tebupirimfos
Chlormephos	Mercuric chloride	Terbufos
Chlorophacinone	Mevinphos	
Difenacoum	Parathion	

Highly hazardous (Class Ib) technical grade active ingredients of pesticides (common name) not permissible in the project

Acrolein	*Ethiofencarb*	Omethoate
Allyl alcohol	Famphur	Oxamyl
Azinphos-ethyl	*Fenamiphos*	Oxydemeton-methyl
Azinphos-methyl	Flucuthrinate	Paris green (C)

Blasticidin-S	Fluoroacetamide	Pentachlorophenol
Butocarboxim	Formetanate	*Pindone*
Butoxycarboxim	Furathiocarb	Pirimiphos-ethyl
Cadusafos	Heptenophos	Propaphos
Calcium arsenate	Isazofos	Propetamphos
Carbofuran	Isofenphos	Sodium arsenite
Chlorfenvinphos	Isoxathion	Sodium cyanide
3-Chloro-1, 2-prppanediol	Lead arsenate	Strychnine
Coumaphos	Mecarbam	Tefluthrin
Coumatetralyl	Mercuric oxide	Thallium sulphate
Zeta-cypermethrin	Methamidophos	Thiofanox
Demeton-S-methyl	Methidathion	Thiometon
Dichlorvos	*Methiocarb*	Triazophos
Dicrotophos	Methomyl	Vamidothion
Dinoterb	Monocrotophos	Warfarin
Edifenphos	Nicotine	Zinc phosphide

Moderately hazardous (Class II) technical grade active ingredients of pesticides (common name) not permissible in the project

Alanycarb	Endosulfan	Paraquat
Anilofos	Endothal-sodium	Pebulate
Azaconazole	Esfenvalerate	Permethrin
Azocyclotin	Ethion	Phenthoate
Bendiocarb	Etrimfos	Phosalone
Benfuracarb	Fenazaquin	Phosmet
Bensulide	Fenitrithion	phoxim
Bifenthrin	Fenobucarb	Piperophos
Bilanafos	Fenpropidin	Pirimicarb
Bioallethrin	Fepropathrin	Prallethrin
Bromoxynil	Fenthion	Profenofos
Bromuconazole	Fenthin acetate	Propiconazole
Bronopol	Fentin hydroxide	Propoxur
Butamifos	Fenvalerate	Prosulfocarb
Butylamine	Fipronil	Prothiofos
Carbaryl	Fluxofenim	Pyraclofos
Carbosulfan	Formothion	Pyrazophos
Cartap	*Fuberidazole*	Pyrethrins
Chloralose	Gamma-HCH	Pyroquilon
Chlordane	Guazatine	Quinalphos
Chlorfenapyr	Haloxyfop	Quizalofop-p-tefuryl
Chlorphonium chloride	Heptachlor	Rotenone
Chlorpyrifos	Imazalil	Sodium fluoride

Clomazone
Copper sulphate
Cuprous oxide
Cyanazine
Cyanophos
Cyflutrin
Beta-cyfluthrin
Cyhalothrin
Cypermethrin
Alpha-cypermethrin
Cyphenothrin
Deltamethrin
Diazinon
Difenzoquat
Dimethoate
Dinobuton
Diquat
Imidacloprid
Iminoctadine
Ioxynil
Ioxynil octanoate
Isoprocarb
Lambda-cyhalothrin
Mercurous chloride
Metaldehyde
Metam-sodium
Methacrifos
Methasulfocarb
Methyl isothiocyanate
Metolcarb
Metribuzin
Molinate
Nabam
Naled
Sodium hexafluorosilicate
Spiroxamine
Sulprofos
Terbumeton
Tetraconazole
Thiacloprid
Thiobencarb
Thiocyclam
Thiodicarb
Trizamate
Trichlorfon
Tricyclazole
Tridemorph
Vernolate
Xylylcarb

Slightly hazardous (Class III) technical grade ingredients of pesticides (common name) permissible under IPM.

Acephate
Acetochlor
Acifluorfen
Alachlor
Allethrin
Ametryn
Amitraz
Azamethiphos
Bensultap
Bentazone
Bromofenoxim
Butroxydim
Chinomethionat
Chlormequat (chloride)
Chloroacetic acid
Chlorthiamid
Copper hydroxide
Copper oxychloride
Cycloate
Mefluidide
Cyproconazole
Metamitron
Dicamba
Fluchloralin
Flufenacet
Fluoroglycofen
Flurprimidol
Flusilazole
Flutriafol
Fomesafen
Furalaxyl
Glufosinate
Hexzzinone
Hydramethylnon
Ipropenfos
Isoprothiolane
Isoproturon
Isouron
Malathion
MCPA-thioethyl
Mecoprop
Mecoprop-P
Cymoxanil
Metalaxyl
Desmetryn
Mthylarsonic acid
Resmethrin
Sethoxydim
Simetryn
Sodium Chlorate
Sulfluramid
Tebuconazole
Tebufenpyrad
Tebuthiuron
Thiram
Tralkoxydim
Triadimefon
Triadimenol
Tri-allate
Triclopyr
Triflumizole
Undecan-2-one
Uniconazole
Ziram
Cyhexatin
Mepiquat
Dazomet
Metconazole
Dichlormid

Metolachlor
Dichlorophen
Nitrapyrin
Dienochlor
N-octylbicycloheptene
Dimepiperate
Paclobutrazol
Demethipin
Pirimiphos-methyl
Dinocap
Propanil
Dodine
Pydridaben
Etridiazole
Pyrifenox
Fluazifop-p-butyl
Dichlorobenzene
2-Napthyloxyzcetic acid
Diclofop
Octhilinone
Difenoconazole
Oxadixyl
Demethametryn
pimaricin
Diniconazole
Propachlor
Dithianon
Pyrazoxyfen
Esprocarb
Pyridate
Ferimzone
Quizalofop
Myclobutanil
Dichlorprop
Nuarimol
Diethyltoluamide
dicarboximide
Demethachlor
Pendimethalin
Dimethylarsinic acid
Prochloraz
Diphenamid
Propargite
Empenthrin
Pyridaphenthion
Fenothiocarb
Quinoclamine

Technical grade active ingredients of pesticides unlikely to present acute hazard in normal use (common name) permissible in the project

Aclonifen
Amitrole
Anthraquinone
Azimsulfuron
Benazolin
Benomyl
Bifenox
Bispyribac
Bromacil
Bupirimate
Butralin
Carbendazin
Chloramben
Chlorfluszuron
Chlorothalonil
Chlorpyrifos methyl
Chlozolinate
Clofentezine
Cloxyfonac
Cyclosulfamuron
Cyromazine
Daminozide
Dichlobenil
Acrinathrin
Ammonium sulfamate
Asulam
Azoxystrobine
Benfluralin
Benoxacor
Bioresmethrin
Bitertanol
Bromobutide
Buprofezin
Butylate
Carbetamide
Chloransulam methyl
Chloridazon
Chlorotoluron
Chlorsulfuron
Cinmethylin
Clomeprop
Cryolite [C]
Cycloxydi
Diamuron
Desmedipham
Dichlofluanid
Alloxydim
Ancymidol
Atrazine
Benelaxyl
Benfuresate
Bensulfuron-methyl
Biphenyl
Borax
Bromopropylate
Butachlor
Captan
Chlomethoxyfen
Chlorbromuron
Chlorimuron
Chlorpropham
Chlorthal-demethyl
Cinosulfuron
Clopyralid
Cycloprothrin
Cyhalofop
Dalapon
Diafenthiuron
Diclomezine

Dicloran
Diclosulam
Diethofencarb
Diflibenzuron
Diflufenican
Dikegulac
Dimefuron
Dimethirimol
Dimethomorph
Dimethyl phthalate
Dinitramine
Dipropyl isocinchomerate
Dithiopyr
Diuron
Dodemorph
Ethalfluralin
Ethephon
Ethirimol
Ethofumesate
Etofenprox
Famoxadone
Fanarimol
Fenbutatin oxide
Fenchlorazole
Fenclorim
Fenfuram
Fenhexamid
Fenoxycarb
Fenpiclonil
Fenpropimorph
Fenuron
Fenuron-TCA
Ferbam
Flamprop
Flucarbazone-sodium
Flucyclozuron
Flufenoxuron
Flumetralin
Flumetsulam
Fluometuron
Flupropanate
Flupyrsulfuron
Flurenol
Fluridone
Flurochloridone
Fluroxypyr
Fluthiacet
Flutolanil
tau-Fluvalinate
Flopet
Fosamine
Fosetyl
Gibberellic acid
Glyphosate
Hexaconazole
Hexaflumuron
Hexythiazox
Hydroprene
Hymexazol
Imazamethabenzmethyl
Imazapyr
Imazapyr
Imazaquin
Imazethapyr
Imibenconazole
Inabenfide
Iprodione
Iprovalicarb
Isoxaben
Kasugamycin
Lenacil
Linuron
Maleic hydrazide
Manozeb
Maneb
Mefenacet
Mepanipyrim
Mepronil
Metazachlor
Methabenzthiazuron
Methoprene
Methoxychlor
Methyldymron
Metiram
Metobromuron
Metosulam
Metoxuron
Metsulfuron methyl
Monolinuron
2-(1-Naphthyl) acetamide
1-Naphthylacetic acid
Napropamide
Naptalam
Neburon
Niclosamide
Nicosulfuron
Nitrothal-isopropyl
Norflurazon
Ofurace
Oryzalin
Oxabetrinil
Oxdiazon
Oxine-copper
Oxycarboxin
Oxyfluorfen
Penconazole
Pencycuron
Pentanochlor
Phenedipham
Phenothrin
Phenylphenol
Phosphorus acid
Phthalide
Picloram
Piperonyl butoxide
Pretilachlor
Primisul furon
Probenazole
Procymidone
Prodiamine
Prometon
Prometryn
Propamocarb
Propaquizafop
Propazin
Propham
Propineb
Propyzamide
Pyrazolynate
Pyrazosulfuron
Pyrimethanil
Pyriminobac

Pyriproxyfen	Pyrithiobac sodium	Quinclorac
Quinmerac	Quinoxyfen	Pyrithiobac sodium
Quintozene	Rimsulfuron	Siduron
Simazine	Spinosad	Sulfometuron
Sulphur	Tebutam	Tecnazene
Teflubenzuron	Temephos	Terbacil
Terbuthylazine	Terbutryn	Tetrachlorvinphos
Tetradifon	Tetramethrin	Thiabendazole
Thidiazuron	Thifensulfuron-methyl	Thiophanate-methyl
Tiocarbzil	Tolclofos-methyl	Tolylfluanid
Transfluthrin	Triasulfuron	Tribenuron
Trietazine	Triflumuron	Trifluralin
Triflusulfuron-methyl	Triforine	Triticonazole
Validamycin	Vinclozolin	Zine

Annex IV: Import and Post Entry Quarantine of Imported Plant Material

The improved plant material shall be imported by the HPHDP from the reputed nurseries situated outside the country. The plant material shall be initially kept in the PEQ under the observation of the DIA (Prof. & Head, Department of Mycology and plant Pathology) to oversee the entry of any pest and disease coming with the plant material from the country of origin. The field officers of the Department at the District and block level as well staff of the PCDOs/ farms shall coordinate with the DIA for ensuring that the imported plant material is free from any pest and disease.
The supply of improved cultivars to the farmers shall be undertaken by calling EOI to be published in the newspaper at the end of one year of mandatory PEQ plantation and observation period is over in the PY1. It is purposed to distribute 200, 000 No. of fruit plants to the farmers for demonstration after one year of PEQ period. The detail of plants to be distributed is as under:

Table 50 No. of fruit plants to be imported

Crop	Plants for on farm demo orchards (No.)	Area covered (Ha.)
Apple	142800	119
Pear	12800	12
Apricot	4800	4
Plum	9600	9
Peach	6000	5
Walnut	9600	24
Cherry	14400	13
Total	**200000**	**186**

In the first three years of the programme, a large amount of plant material will be imported (see Table Above) These plants will be placed in 'quarantine' sites, in the PCDOs. There will also be additional quarantine nursery sites in Shimla (Annu, 2 sites), Chamba (Kilod, 2 sites: Nehla, 1 site) and Sirmour (Kawagdhar1 site). The latter are for the 251,000 No. trees imported for early establishment of demonstration orchards at farmer's field.

There are strict rules around quarantine requirements for imported plant material, and these rules and regulations will be strictly adhered to by the programme. The regulations are listed in the 'Plant Quarantine Order (Regulation of Import into India), 2003'.

The environmental impacts seen as consequences of entry, establishment of imported root stocks are the spread of various kinds of pests which have the risk of introduction in temperate fruits in Himachal Pradesh. Some of these are Fire blight, codling moth and plum pox virus. The pest risk analysis is mandatory for all the plants/plant material prior to its import into India as per PQ Order, 2003. Pest surveillance is an integral component of plant quarantine services to make them useful and effective.

Table 51 Potenial Risks and Mitigation Measures with Imported Plant Material

	Potential Risk	Mitigation Measure
1	A pest or disease outbreak in the stoolbed or nursery, particularly if it related to a quarantine organism, could result in loss of a substantial amount of plant material, and potentially delay achievement of targets.	To mitigate this risk, strict hygiene and monitoring protocols will be imposed to prevent major outbreaks occurring. To further mitigate the risk, nurseries will be established at different sites (3+), so that an outbreak will not threaten the entire production. The imports of plant material from offshore should be minimised, to limit the risks of importing foreign pests and diseases.
2	Release of diseased material from nurseries to orchards which would have a detrimental effect on area expansion and the long term health and viability of the crop.	Plant imports shall be restricted to the first 3 years of the programme. A measured approach to area expansion using material produced from locally propagated trees will aid this. Rapid establishment of nurseries, and focus on rapid multiplication in the early years will minimise the quarantine risks from imported material. The project will also seek international advice on best practice hygiene and Pest and Disease monitoring.
3	Risk of nurseries bulking up millions of trees, but not have the demand for these trees from growers.	A good ICT programme about the project, and support and advice networks for potential growers. Plant material will be pre ordered, so that the nurseries are not left holding valuable material that cannot be sold. The project also has an accreditation scheme for nurseries to ensure only high quality material is released to growers.

Accreditation of Fruit Nurseries: Existing rules framed under the Himachal Pradesh Fruit Nurseries Registration and Regulation Act, 2015 provide for record keeping of the Departmental Fruit Nurseries. However, each one of them individually does not completely define a Model Horticulture Nursery. Therefore, it is imperative to define a Model Nursery in all the three aspects of Nursery Infrastructure, Production system and Quality parameters of planting material and Good Nursery Management Practices in a comprehensive manner and put a nursery recognition regime in place. A model Horticulture Nursery should function as a reliable source of supply of quality planting material for horticulture crops. With a view to ensure availability of good quality planting material as outlined above, the National Horticulture Board (NHB) has started a system of Recognition of Horticulture Nurseries on voluntary basis. Hence, the fruit nurseries to be taken over from the Department under the SPV shall be accredited with the NHB to establish a network of quality nurseries across the State for the purpose of propagation and distribution of quality planting material of specified horticulture crops to the farmers.

The following action shall be taken in this regard by the Incharge of PCDO/Fruit Nursery.

- The Incharge of the PCDO shall apply to the NHB for the accreditation of the Fruit Nursery on the prescribed Performa as given on the website of NHB i.e. www.nhb.gov.in.
- Necessary data with regard to management of Fruit Nursery shall be provided to the team visiting for inspection and accreditation of fruit nursery

Surveillance provides vital information for development of robust quarantine policies and also facilitates early detection of invasive alien species which is very essential for their eradication. Establishment of pest free areas and areas of low pest prevalence to gain market access can be achieved only through well-designed pest surveillance programme. Imported plants will be inspected by a designated inspection authority (DIA), to ensure that no new pests or diseases are imported into the country. Plants detected with new pests or diseases will be destroyed and containment measures put in place. The Dr. YS Parmar University of Horticulture & Forestry, Nauni, Solan (HP) is currently the registered DIA for carrying out these inspections.Even beyond the quarantine period, pest and disease monitoring and management is essential to ensure a supply of healthy, disease-free trees to growers. Training of nursery staff at all levels to recognise abnormal plants or pest and disease issues will be essential to provide early detection of pest or disease issues.

For import and quarantine requirements for imported root stocks the following steps will be followed based on Plant Quarantine Order 2003 (Ministry of Agriculture, GOI)

1. Project applies year to year basis about the intention to import planting material and shall be kept at specified locations for Post Entry Quarantine for a year as per Plant Quarantine Order 2003.

2. Undertaking from Professor & Head, Plant Pathology, UHF Nauni, Solan (Designated PEQ Authority for HP) that they will conduct (PEQ) at the specified locations.

3. Applied to Secretary MOA, GOI for import permit along with Pro forma Invoice of the material and the consent of Professor & Head, Plant Pathology to conduct PEQ.

4. Inspection of PEQ sites and facilities by GOI officers.

5. Issue of Import Permits by Directorate of Plant Protection, Quarantine & Storage, Faridabad (MOA, GOI).

6. Import of planting material from the nursery accompanied by the Phytosanitory certificate issued by the concerned agency of the country of origin.

7. Inspection and release of material by Directorate of Plant Protection, Quarantine & Storage, Faridabad (MOA, GOI).

8. Material kept for PEQ under the supervision of Professor & Head, Plant Pathology, UHF Nauni, Solan (Designated PEQ Authority for HP).

9. Satisfactory PEQ report submitted by the PEQ Authority to Directorate of Plant Protection, Quarantine & Storage, Faridabad (MOA, GOI).

10. After all these steps, the material can be put to use by the concerned agency (HPHDP)

Annex V Details of Chloropicrin

Specific Apple Replant Disease (SARD) is a major problem in apple orchards worldwide, preventing re-establishment of healthy apple orchards. SARD will be a major impediment to the replanting requirements for the programme. Remediation such as soil fumigation in apple replant land is standard practice in many countries, and fumigated replant land will generally be as productive as untreated new land. Some apple growers in India have historically used formalin to drench replant soil, but this is now illegal. Internationally, chloropicrin, Telone II (1,3-dichloropropene), metam sodium and basamid (Dazomet) are widely used as pre-plant fumigants, with chloropicrin or chloropicrin/Telone mixes being most favoured for apple replant. Of these products, only Dazomet is currently registered in India.

The current unavailability of chloropicrin in India seriously restricts the options available to Indian growers, and impacts the project's plans for replanting and rejuvenation of orchards. Without chloropicrin, growth and productivity of replanted trees will generally be extremely poor, and probably economically unviable. The replanting targets that have been set for the project are based on efficient fumigation of soil allowing almost immediate replanting, followed by rapid establishment and productivity of replanted trees. Chloropicrin unavailability will also have repercussions for nurseries, which will rely on fumigation of land between removal of one batch of trees and planting of the next. Without this, nursery productivity and tree health will decline, unless substantial new areas for nursery production can be found every year. However, other soil management practices could potentially be used in some situations. These include soil replacement, incorporation of organic material, fallow, soil solarisation, crop rotation etc. Information on these practices, including their pros and cons shall be provided to growers. Comparison of these practices with soil fumigation will be made in PCDOs to allow informed decisions to be made by growers.

Pursuit of registration of chloropicrin in India is an early aim of this project by year 2 of this programme. Each fumigation team will be capable of treating 15 ha per year.

Standard Operation Procedures for application of chloropicrin.

(Hand application) Metered concentrated or dilute emulsified product applied through a robust, sealed hand held injection tool to a depth of 30/50 cms on an individual or 30cms grid pattern. Applied through or before sealing the barrier film.

(Drip application) Metered concentrated or dilute emulsified product continually injected (specialist equipment) into the irrigation flow through a pre-laid and barrier film covered tested drip irrigation system. The irrigation system is primed prior to introduction of the product and flushed after application. The dripper spacing can vary but 30cms is the normal spacing with the distance between irrigation lines also normally being 30cms

(Motor driven) Metered concentrated or dilute emulsified product is introduced to a depth of 30- 50 cms through injection points evenly spaced (30 cms) across the treatment width. Barrier film can be laid concurrently or separately.

Formulation of chloropicrin that would be most suitable for Himachal Pradesh would be Chloropicrin 100 and Chloropicrin EC wit possible dosage range 30g/65g/m^2 (dependent on Indian registration and demonstration trials results per unit area being recommended in USA and/or other countries)

Issues that may impact the timelines for trials and application of cholorpicrin

1. steep topography and accessibility of orchards
2. No registered available pre-plant solution for Specific Apple Replant Disease (SARD), nematodes or other soil borne pathogens.
3. Lack of modern clonal rootstocks and limited varieties.
4. Lack of high health status quarantine nursery for imported and domestic plant material and modern orchards planting/growing systems.
5. Shortages of on farm water storage for drip and mini sprinkler irrigation.

Potential Environment Risk	Environmental Guidelines
Cholorpicrin is toxic to mamals and birds, and shouldn't contaminate any water source even while disposing of equipment washwaters or rinsate.	Cholorpicrin only through drip (trickle) irrigation systems and not through any other type of irrigation system.
Low level of Knowledge to fumagators/handlers of cholopicrin	Information that must be provided annually and must include the following: (1) what fumigants are and how they work, (2) safe application and handling of soil fumigants, (3) air monitoring and respiratory protection requirements for handlers, (4) early signs and symptoms of exposure, (5) appropriate steps to take to mitigate exposures, (6) what to do in case of an emergency, and (7) how to report incidents.
The project staff, applicators lack information about cholorpicrin, trained human resources not deployed may lead to toxicity of soil and risk of direct exposure to handlers.	The project will deploy a Soil Fumigant Training Program: Certified applicator training that provides information on (1) how to correctly apply the fumigant, including how to comply with new label requirements; (2) how to protect handlers and bystanders; (3) how to determine buffer zone distances; (4) how to complete an FMP and the post-application summary; (5) how to determine when weather and other site-specific factors are not favorable for fumigant application; (6) how to Develop and implement emergency response plans.
For untarped applications of chloropicrin, leaching and runoff may occur if there is heavyrainfall after soil fumigation.	Do not connect an irrigation system (including greenhouse systems) used for pesticide applications to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place

Annex VI- Details on Stakeholder Consultations

S. No.	Date	Group
1	18/11/2015	Mahakali Farmer Cooperative , Jubal Hatti
2	18/11/2015	RegionalHorticulture Research and Training Station Dr. Y. S. Parmar University, Mashobra-
3	19/11/2015	Water User Association, Thalai village, Theog Block
4	19/11/2015	Farmer consultation at Narkhanda
5	19/11/2015	Shathla Cooperative society, Shathla
6	19/11/2015	HPMC CA, Grading sorting and packing facility- Jarol Tikkar, Kotgarh—
7	19/11/2015	Ikant wadi – Matiana
8	06/12/2015	Government Department Consultation -Agriculture Department, Kullu—
9	07/12/2015	Public Consultation –Jia Village-Bhunter
10	07/12/2015	Fruit Grower Association---
11	10/12/2015	Public Meeting at Teesa block, Chamba,--
12	10/12/2015	Meeting with Block Development Officer, Teesa, Chamba district
13	10/12/2015	Meeting with Churaha Valley Alternative Agro and Horticulture Development, Marketing Cooperative Society
14	10/12/2015	Meeting with Tribal Women SHG (with Jagori - NGO)

Annex VII - Details on Project Interventions by District

Table 52 District wise details of Project Interventions

	Unit	Shimla	Kullu	Kinnaur	L&S	Solan	Sirmaur	Mandi	Chamba	Una	Hamirpur	Kangra	Bilaspur	Total (unit)
Apple	**Ha**													
Area Expansion	**Ha**	1000	800	300	200	0	2000	700	2000	0	0	0	0	7000
Rejuvenation	**Ha**	3500	2300	1500	0	0	0	1500	0	0	0	0	0	8800
Re plantation	**Ha**	1500	900	100	0	0	0	500	0	0	0	0	0	3000
Other Fruits	**Ha**													
Area Expansion	**Ha**	1350	1450	50	0	1200	1850	600	1300	900	500	1400	600	11200
Total	**Ha**	7350	5450	1950	200	1200	3850	3300	3300	900	500	1400	600	30000
PCDOs	**No.**													
Apple	**No.**	5(Duttanagar, Sarahan, Anu, Chopal, Gopalpur)	1 (Bajaura)	2(Gyabong, Pooh)		1(UHF)	2(Kwagdhar, Bagthan)	2(Janjhali, Kingas)	1 (Kilod)			2 (Palampur, HPKW)		
Other Fruits	**No.**	2 (Dhalli, Khadrala)	3 (Chowai, Sagot, Bajaura)			2 (Patta Mehloy, Darlaghat)	4 (Norha, Jbbal Chandresh, Rajgarh, Shirumyala)	2 (Pangna, Harabagh)	2 (Rajpura, Bhanota)		1 (Badiyana)	3(Jach, Bhumpal, Indpur)	1 (Nihal)	
Bee keeping														
Agri-Processing Centres	**No.**					2 (Parwanu, Jabli)		1 (Jarol)						

	Unit	Shimla	Kullu	Kinnaur	L&S	Solan	Sirmaur	Mandi	Chamba	Una	Hamirpur	Kangra	Bilaspur	Total (unit)
Market Yards	**No.**													
Existing		2 (Parala-Theog, Bhattakkuffar)	3 (Bhuntar,Patlikuhal, Shaat)			2 (Solan, Parwanwo)	1(Ponta Shahib)	2(Takoli,Kangani)				2 (Dharamshala,Palampur)		
Greenfield (Nos)		1 (Mendheli)	1 (Bandrol)											
Total		**3**	**4**			**2**	**1**	**2**				**2**		**14**
Pack houses	**No.**													
Existing	**No.**	4 (Gumma, Jaroltikkar-, Oddi-Kumarsain, Rohru,	1 (Patlikuhal)											
Greenfield (Nos)	**No.**		1 (Bhunter)	4 (Pooh, Ribba, Nichar, Sangla)	1 (Spiti)		3 (Rajgarh/Nauradhar, Sangarh, Shillai)	2 (Jangheli, Karsog)	4 (Churah , Bharmour, Salooni , Pangi)					
Total	**No.**	5	2	5	1		3	4	4					24
FPOs	**No.**	4 (Theog, Rohru, Jubber Hatti, Chopal)	3 (Kullu, Nagar, Nirmand&Rampur)	1(Reckongpeo)	1(Lahaul)	1 (Solan& Kandaghat)	2 (Papnta Sahib,Sangarh))	3 (Sadar, Bahl, Karsog)	4 (Bharmaour, Salooni , Bhatiya	1(Una)	2(Nauaun, Bijri)	3 (Nurpur, Samloti, Palampur)	2 (Bhager, Namhol)	27

	Unit	Shimla	Kullu	Kinnaur	L&S	Solan	Sirmaur	Mandi	Chamba	Una	Hamirpur	Kangra	Bilaspur	Total (unit)
									t, Chamba)					
CSCs	**No.**	5 (Theog, Rohru, Jubber Hatti, Chopal)	4 (Kullu, Nagar, Nirmand&Rampur)	1(Reckongpeo)	1(Lahaul)	2 (Solan& Kandaghat)	3 (Papnta Sahib,Sangarh))	4 (Sadar, Bahl, Karsog)	5 (Bharmaour, Salooni, Bhatiyat, Chamba)	1(Una)	2(Nauaun, Bijri)	4 (Nurpur, Samloti, Palampur)	3 (Bhager, Namhol)	27
CA	**No.**													
Existing		5 (Gumma, Jaroltikkar-, Oddi-Kumarsain), Rohru,	1 (Patlikuhal)											
Greenfield (Nos)							Nauradhar		Churah					
Cold Storages	**None Proposed under this project**													
Source: Department of Horticulture, HPMC, Y.S.Parmar University, HPSAMB														

Annex VIII–Social Impact Screening Checklist

Issues	Findings/Observations
Land, purchased (mutual consent), lease or donation	
Purpose of land take for CSC/CA, Agro-processing centres, storage/Irrigation(water Storage structures)/Market Yard, etc.	
Ownership status and current usage of land to be taken	
Any loss of/impact on:	**Y/N, If Y, provide description**
agricultural, residential and other productive assets	
Shelter, fixed assets	
crops, trees	
businesses or enterprises due to land acquisition and lead to loss of income sources and means of livelihoods	
access to natural resources, communal facilities and services	
Change in land use, leading to adverse impact on social and economic activities	
Information on Affected persons/Common Resource	
Estimate on affected persons	[ ] No [ ] YesIf Yes, approximately No.
Nature/Type of affected persons	
Poor, female-heads of households, or vulnerable	[ ] No [ ] YesIf Yesapproximately No.
Encroachers and/or squatters	[ ] No [ ] YesIf Yesapproximately No.
Nature/Type of Common Resource (Provide description)	
Outcome: Is the site free of any encumbrances: Yes or No:	

Annexure IX - Format for recording Free, Prior and Informed Consultation

Date:	
Venue:	
Participant Details	
Category	**Number of Participants**
Village community	
Women	
Government Officials	
Tribal	
NGO, cooperative Societies	
Total	

Consultation Summary

Introduction of the Project(Intervention):

Profile of the Farmers:

Current Agriculture/Horticulture practice(Production, Market):

Ongoing Government Scheme(Including Subsidy):

Issues, experiences , Constrains, challenges:

AnticipatedProject Benefit:

expected support(Training, Farm inputs, Exposure visits):

Anticipated Adverse Impact

Overall Support to project

Signature of the Participants (Annexed)

Annex X - Outline of TDP

1. Project Description - HDHDP and proposed sub-project
2. Objectives of TDP
3. Methodology for preparation of TDP (include results from the Screening exercise)
4. Minimization of impacts
5. Social Assessment
    a. Household survey findings
    b. Impact details - positive impacts and adverse impacts on assets, community resources, livelihood etc.
    c. Outcomes of free and prior informed consultations (FPIC) undertaken to prepare the sub-project
6. Action Plan
    a. mitigation measures (as outlined in the TDF)
    b. FPICs to be undertaken during implementation
    c. implementation schedule (by activities and months)
        i. FPIC
        ii. Provision of mitigation measures
        iii. monitoring of implementation
    d. monitoring indicators (as necessary by sub-project)
    e. implementation budget including cost of
        i. mitigation measures
        ii. conducting FPICs - material, logistics
        iii. miscellaneous contingency
    f. grievance mechanisms (by level of mechanism)

Annex XI - Monitoring indicators

Type	Indicators
KPI	Number of direct project beneficiaries of which female (percentage)
Impact Indicators	Number of direct project beneficiaries of which: • small farmers • margiinal farmers • tribal farmers (segregated by men and women)
	Number of water users provided with new/improved irrigation Services segregated by male and female, small farmers, margiinal farmers, tribal farmers (segregated by men and women)
	Number of operational water users associations created/reconstituted and strengthened by composition segregated by (women farmers, small farmers, marginal farmers and tribal farmers (segregated by men and women)
	Number of clients who have adopted an improved horticultural/ agricultural technology promoted by the project. segregated by (women farmers, small farmers, marginal farmers and tribal farmers (segregated by men and women)
	Number of client days of training provided. segregated by (women farmers, small farmers, marginal farmers and tribal farmers (segregated by men and women)
Project Outcome Indicators	Number of farmers who received elite planting material segregated by (women farmers, small farmers, marginal farmers and tribal farmers (segregated by men and women).
	Percentage increase in net farm revenue over control group segregated by (women farmers, small farmers, marginal farmers and tribal farmers (segregated by men and women).
	Increased share of wholesale price realized by producers segregated by (women producers, small farmers producers, marginal farmer producers and tribal farmers (segregated by men and women)
	Increased share of selected horticulture commodities sold through new marketing channels. segregated by (women farmers, small farmers, marginal farmers and tribal farmers (segregated by men and women)
Intermediate Outcome Indicators	Measure of diversification (number of farmers adopting higher value cultivars) segregated by (women farmers, small farmers, marginal farmers and tribal farmers (segregated by men and women)
	Change in production volume for targeted commodities among project beneficiaries segregated by (women farmers, small farmers, marginal farmers and tribal farmers (segregated by men and women)
	Number of clusters covered by providing water harvesting & irrigation support by composition segregated by women farmers, small and marginal farmers, tribals
	Number of project beneficiaries adopting climate – smart agriculture (CSA) practices promoted by the project segregated by composition: women farmers, small and marginal farmers, tribals
	Number of farmers obtaining warehouse receipts. segregated by (women farmers, small farmers, marginal farmers and tribal farmers (segregated by men and women)
	Number of farmers adopting Good Agricultural Practices segregated by (women farmers, small farmers, marginal farmers and tribal farmers (segregated by men and women)
	Number of exposure visits conducted by composition of participants segregated by women farmers, small and marginal farmers, tribals
	Number of trainings organized by type of training (Beekeeping, vermicomposting, vegetable cultivation) and by composition of participants segregated by women farmers,

Type	Indicators
	small and marginal farmers, tribals
	No. of Ha of land brought under IPM
	No. of Ha of cropping area using integrated Crop management practices
	Increment (%) in cropping area using bio-pesticides
	Production increase of Vermicompost (tons) at the farm level
Physical	Quantum of land by type (Panchayat, private, government land) taken by type (lease, donation, gift) for setting up CSCs, Irrigation infrastructure,
	Number of infrastriucture sites with safe disposal of of solid and liquid waste
	Number of lands by type (Panchayat, private, government land) taken by location segregated by location - tribal and non-tribal areas
	Number of farmers giving up land segregated by men and women
	Number of lands (existing and newly identified) screened for adverse impacts
	Number of lands 'rejected' due to existing encroachments or unauthorized occupation
Institutional	Setting up of ES Cell with E&S cell at PCU, PIUs and DIUs
	Hiring of Social Development specialists at DIUs
	Number of water user associations formed segregated by composition of women farmers, small and marginal farmers, tribals
	Number of FIGs, FPOs and CSC segregated by composition of women farmers, small and marginal farmers, tribals
	Composition of GRMs by composition segregated by composition of women farmers, small and marginal farmers, tribals
Processes	Number of Consultations held by composition of participants segregated by women farmers, small and marginal farmers, tribals
	Number of female cadre/tribal cadre of community mobilizers formed
Tribal (specific community needs)	Number of specific community needs expressed and addressed by location (non-tribal areas and ITDP areas)
Grievance resolution	Number of grievances received by type of grievances
	Number of grievances segregated by women farmers, small and marginal farmers, tribals
	Number of grievances received and redressed by level and number of attempts

Annex XII Tribal Development Framework

1 Project Description

The Project Development Objective (PDO) is: "to support small farmers and agro-entrepreneurs to increase the productivity, quality, and market access of selected horticulture commodities in Himachal Pradesh". The project aims to address key well known gaps and deficiencies in the horticulture sector in Himachal Pradesh and transform the sector (and the overall rural economy) to being more productive, efficient and profitable. By doing so, it will contribute to the key aspects of GoHP and the Bank's strategic objectives related to faster and broader agriculture sector growth and inclusive development.

Target beneficiaries under the project will be small and marginal farmers. As majority (70 %) of agriculture producers in Himachal Pradesh are marginal, the project would mostly benefit this category of farmers. In addition, project will have potentially significant impact on promoting gender inclusiveness through employment creation in post-harvest management and processing which traditionally employ a much higher proportion of female labour.

2 Project Components and Planned Interventions

The project components and planned interventions are presented in the table below

Project Components and Interventions		
Component	**Objectives**	**Planned Interventions**
A. Horticulture Production and Diversification	to enhance horticultural competitiveness at the farm level by supporting access to knowledge, technology and finance in order to increase long term productivity and farm incomes in an environment marked by changing market patterns and increased climate variability	(i) enhancing producer's access to disease free elite planting materials; (ii) supporting sustainable intensification and diversification of horticultural production through technology and knowledge transfer, including harvest, capture, collection, delivery and distribution of water; and (iii) strengthening applied research and development; and enhancing the access to finance to producers.
B Value Addition and Agri-enterprise Development	improve value realization at the farm level, promote investments in agribusiness, fostering backward and forward linkages in the value chains for horticulture products, support supply chain infrastructure that prevents wastage and value erosion; and enable secondary and tertiary processing that create higher value for the produce	(i) building community/farm level marketing capacities and supporting them through matching grants to acquire productive assets; (ii) establishing a modern supply chain comprising pack-houses, controlled atmosphere (CA) stores, and processing facilities to be operated under Public Private Partnerships (PPP) arrangement; (iii) providing access to warehouse receipt systems linked to commodity exchanges; identifying, mobilizing and supporting agro entrepreneurs; (iv) facilitating access to finance for agribusiness enterprises, including collectives such as

Project Components and Interventions		
Component	**Objectives**	**Planned Interventions**
		producer companies.
C. Market Development	to provide an improved platform for market-related information and intelligence, expand market access through alternative marketing channels, enhance transparency in the price discovery process, and improve market infrastructure	(i) supporting market information and intelligence services; (ii) introducing of e-marketing platforms; and (iii) upgrading wholesale markets.
D. Project Management, Monitoring and Learning Project Management, Monitoring and Learning	ensure the effective implementation of the project activities and monitor and evaluate project implementation progress, outputs and outcomes, building on implementation experience.	support: (i) establishment and operations of Project Coordination Unit (PCU), which will oversee and coordinate activities of the implementing agencies of the project; (ii) establishment and operations of Project Implementation Units in the respective implementing agencies; and (iii) setting up of a monitoring and evaluation (M&E) system for the project, including a project management information system and contracting an external M&E agency to monitor project activities and impact. It will also finance dedicated staffing for the project activities that are attributable to the outcomes of the project, consultancies, training and related material, office equipment, and operational costs.
		Source: Project Implementation Plan, HPHDP, 2015

3 Project Interventions in Tribal areas

HDHDP would be implemented across all the twelve (12) districts in the state. In the three major tribal districts - Chamba, Kinnaur and Lahaul-spiti, area expansion, rejuvenation and replantation under Apple and area expansions under the other fruits; setting up of PCDOs, greenfield packhouses, Compressed Atmosphere storage (CAs), FPOs and Common Service Centres (CSCs) would be major activities. Project interventions in these Tribal dominated areas are presented in **Table 55** below:

Table 53 Project Interventions in major tribal districts by location

Project Interventions	Unit	Kinnaur	L&S	Chamba
Apple				
Area Expansion	**Ha**	300	200	2000
Rejuvenation	**Ha**	1500	0	0
Replantation	**Ha**	100	0	0

Project Interventions	Unit	Kinnaur	L&S	Chamba
Other Fruits				
Area Expansion	**Ha**	50	0	1300
Total	**Ha**	1950	200	3300
PCDOs	**No.**			
Apple	**No.**	2(Gyabong, Pooh)		1 (Kilod)
Other Fruits	**No.**			2 (Rajpura, Bhanota)
Bee keeping	**No.**	To be decided under the research component		
Agri-Processing Centres	**No.**	0	0	0
Market Yards	**No.**	0	0	0
Pack houses	**No.**			
Existing	**No.**	0	0	0
Greenfield (Nos)	**No.**	4 (Pooh, Ribba, Nichar, Sangla)	1 (Spiti)	4 (Churah, Bharmour, Salooni, Pangi)
Total	**No.**	5	1	4
FPOs	**No.**	1(Reckongpeo)	1(Lahaul)	4 (Bharmaour, Salooni, Bhatiyat, Chamba)
CSCs	**No.**	1(Reckongpeo)	1(Lahaul)	5 (Bharmaour, Salooni, Bhatiyat, Chamba)
CA	**No.**			
Existing	**No.**	0	0	
Greenfield (Nos)	**No.**	0	0	1 (Churah)

Source: Project Implementation Plan, HPHDP, 2015

4 Need for Tribal Development Framework (TDF)/Indigenous Peoples Development Framework (IPDF)

The World Bank recognizes that the identities and cultures of Indigenous Peoples are inextricably linked to the lands on which they live and the natural resources on which they depend. These distinct circumstances expose Indigenous Peoples to different types of risks and levels of impacts from development projects, including loss of identity, culture, and customary livelihoods, as well as exposure to disease. Gender and intergenerational issues among Indigenous Peoples also are complex. As social groups with identities that are often distinct from dominant groups in their national societies, Indigenous Peoples are frequently among the most marginalized and vulnerable segments of the population. As a result, their economic, social, and legal status often limits their capacity to defend their interests in and rights to lands, territories, and other productive resources, and/or restricts their ability to participate in and benefit from development.

Box 7.1 - % of tribal population by district

District	% age
Bilaspur	2.80
Chamba	26.10
Hamirpur	0.67
Kangra	5.60
Kinnaur	57.95
Kullu	3.84
Lahaul-Spiti	81.44
Mandi	1.28
Shimla	1.08
Sirmaur	2.13
Solan	4.42
Una	1.65

Source: HPSCSTC, 2014

As HDHDP would be implemented across all the twelve (12) districts having varied proportion of tribal population **(See Box 7.1)**, it triggers World Bank's Operational Policy (OP) 4.10 on Indigenous Peoples While some project interventions such as Market yards, Cold storages, area expansion are broadly identified by location, subsequent interventions would be planned in tribal areas based on demand assessment and with their free, prior and informed consent. No acquisition of lands is proposed for any intervention under the project and as a result, no direct impacts on tribal communities pertaining to land acquisition are envisaged. As activities such as irrigation infrastructure i.e. water storage/supply are demand driven, their actual locations would be known at a later date. Hence, the preparation of a Tribal Development Framework is a pre-requisite. The TDF would form the basis for preparation of TDP as and when the projects and site locations are identified and on screening whether the impacted population indeed possess the four characteristics as defined in the Operational Policy 4.10.

5 Objectives of TDF (IPDF)

The principal objectives of TDF/IPDF are to:

- avoid or to minimize to the extent possible, any kind of adverse impact on the tribal community and to suggest appropriate mitigation measures;
- ensure that the project engages in free, prior and informed consultation with tribal people in the entire process of planning, implementation and monitoring of project;
- identify the views of tribal people regarding the proposed project and ascertain broad community support for the project;
- to ensure that project benefits are accessible to the tribal communities living in the project area;

6 Methodology adopted for TDF (IPDF) preparation

For this purpose of preparation of TDF, the following approach was adopted:

- a desk based review of socio-economic baseline of STs in the state was carried out for which data was collected from the following secondary sources: (i) census records for demographic information,

(ii) Tribal Development Department and HP Scheduled Castes and Scheduled Tribes Development Corporation for information on notified Scheduled Tribes, details about various development schemes intended for the benefit of STs, i.e. both centrally sponsored and state level programs were reviewed.

- review of legal and regulatory provisions at the national, state and guidelines specific to the tribal areas of the state in order to understand their economic, social, and legal status and rights to lands, territories, and other productive resources.
- the institutional arrangements at state level - HPSCSTDC and Tribal Development Department had been studied and their current delivery systems.
- series of stakeholder consultations were carried out particularly in areas of project interventions that are currently identified. The participants in these interactions included: farmers, representatives from horticulture development department, irrigation and agriculture, cooperative societies. The purpose of these stakeholder consultations were to:
    - introduce the project - HDHDP to these communities;
    - understand the profile of the farmers in terms of size - large, medium, small and marginal, SC/ST and women;
    - current farm practices from production to marketing;
    - elicit their knowledge in respect of ongoing government scheme, including subsidies available:
    - elicit their concerns, constraints faced and challenges experienced that could feed into the project design or proposed interventions;
    - learn about their understanding of anticipated project benefits and adverse impacts, if any;
    - assess their demand in terms of expected support such as: training, farm inputs, exposure visits); and
    - seek their overall opinion and impressions on the proposed project.

7 Stakeholder Consultations

Stakeholder consultations were held to ascertain likely social and environmental issues that need to be addressed during project preparation; understand current practices from production to marketing, validate findings from desk reviews, understand perceived benefits of the various interventions, awareness regarding government schemes, constraints faced, prevalent government schemes, etc. Details are presented in ensuing sections.

Typology of stakeholders: The Stakeholder Consultation process considered a number of stakeholders who were engaged at different levels. The purpose was to ascertain their relevance and role in HPHDP during preparation and later during implementation. **Table 56** presents the stakeholder analysis:

Table 54 Stakeholder Analysis TDF

Stakeholder type	Importance in HPHDP	Rationale for consultation
Farmers women members of Self Help Groups (SHGs), Tribal Farmers, leaders,	These are persons mostly engaged in farming across the state and would be covered under the project interventions	While certain project interventions are already identified within tribal blocks, all such persons have varied experiences relating to farming, marketing of produce and have latent needs and demands that could be covered under the project design and processes such as need for training on

Stakeholder type	Importance in HPHDP	Rationale for consultation
		different crops, need for irrigation infrastructure, market yards, etc. Hence they were consulted to understand their concerns, previous experiences, expectations and suggestion on livelihoods restoration.
Farmers Producer Organization (FPOs), Producers, Farmer Interest Groups (FIG), Cooperative societies, Non Government Organization(NGOs)	These are persons currently practicing farming as a group or formed as a cooperative and have experiences in either collective procurement of farm inputs and marketing of produce, import and sale of rootstocks, setting up Polyhouses and/or forming water associations for setting up of irrigation infrastructure. While some of them practice horticulture others are engaged in vegetable and/or floriculture.	Such already formed group/cooperatives with varied levels of awareness give the project an opportunity to introduce the project interventions and help scale up. NGOs already operational in the area and involved in community mobilization would be key stakeholders in spreading awareness.
Horticulture Development (Subject Matter specialist, HDO, HEOs), Block Development Officers, Agriculture Department	These officials who are part of the project implementing agency, would be key to assessment of demand, planning and implementation of all proposed project interventions.	Informing them of the proposed project and understanding their present roles and responsibilities, constraints faced by these officials, need for capacity building were noted for proposing measures under the ESMF

Aims of Community Meetings and Institutional Consultations:

Table 57 below summarizes the objectives of the community meetings and PAP consultations held.

Table 55 Aims of Stakeholder Consultations

Community Level	**Institutional Level**
Create general public awareness amongst the potential beneficiaries about HPHDP	To learn about the current and best local level practices from district officials and cooperatives
Broadly explain the project processes and planned interventions	to learn about the current challenges faced in terms of accessibility, awareness regarding pesticides, fumigants and other farm inputs schemes
Elicit communities support to the project and Increase HPHDP acceptability	
Understand communities' current practices from procuring of inputs to marketing of produce - their experiences, success	Assess institutional capacity to plan and implement project interventions
Understand constraints faced, needs for training, exposure, capacity building	

Outcomes of Stakeholder interactions: Stakeholder consultations were organized in two of the tribal districts - Chamba and Kinnaur. Key Issues from stakeholders, responses provided and their incorporation in the ESMF is provided in the **Table below:**

Table 56 Aims of Stakeholder Consultations TDF

Stakeholders	Participants	Key issues discussed
Public Meeting at Teesa block, Chamba,	Farmers, HDO, HEO, Lead Farmers, NGO	• Support for marketing is an area of concern; though the department had been supportive in providing guidelines and technical inputs • apples were smaller in shape and less vibrant in color due to inappropriate farming practices or lack of necessary training on usage of pesticides by crop cycle • 10% area has irrigation facility • nearest market is Amritsar to which all produce is taken as they lack a market place here. Further the packaging facilities are relatively low as only 10 kg boxes are packed in here at Teesa whereas the markets in Shimla. There is no mechanized packing system here.
Meeting with Block Development Officer, Teesa, Chamba district	Block development officer, Department of Horticulture	• Jasoragarh, Chilli, Choli, Deola, Kajjur and Gujjar are the main tribal clusters. Accessibility is the main issue in the area, therefore exposure is very limited. • orchards in the area are senile and at the stage of re-plantation • provision of ropeway, etc. to overcome accessibility constraints can be considered
Meeting with Churaha Valley Alternative Agro and Horticulture Development, Marketing Cooperative Society, Teesa, Chamba district	Officials of society, Department of Horticulture,	• has 1023 members of which 70% are Tribals. • is involved in import of rootstocks, and their sale to farmers. Members of their society sell about 50% to 60% of their produce collectively. Recently they have taken up land for cultivation within their own society on lease at rate of Rs. 25000/ per bigha/year.
Meeting with Tribal Women SHG (with Jagori - NGO), Dogali, Choli Panchayat	Representative of NGO, Tribal women farmers	• women are also involve in agriculture activities right from preparation of land and harvest including seedling, application of fertilizers, sowing, ploughing, sowing, spraying, though sale of produce is exclusively undertaken by men who deal with the contractors or agents. • Few ladies in the village also have landholding of their own. • Most of the land is rain-fed with less than 10% of their land is irrigated. • Currently only subsistence agriculture is practiced and they consume whatever is produced. • some of the households are involved in beekeeping • Training on Mushrooms, onions, Beekeeping, Vermi-composting is expected

Key consultations in respect of their implications by component for TDF are summarized below:

Components	Summary
A: Horticulture Production and Diversification	• Quality planting material and technical knowledge of pesticides is key requirement as their current experience of inputs procured from government is not satisfactory • Irrigation infrastructure is a major need for which farmers are willing to support project interventions in terms of provision of land as necessary • Training and capacity building is a major requirement of farmers, entrepreneurs • Subsidies exist on different schemes in agriculture and horticulture thereby enabling convergence with project interventions • Expect technical training related to new technology related to Horticulture and Floriculture; and WUA practices relating to roles and functioning • need protection from hail storms and expect better insurance coverage • women groups are keen to cultivate mushrooms and other vegetables such as onions and also other trainings on beekeeping, etc.
B: Value Addition and Agri-enterprise Development	• cold storage is a major need for which farmers are willing to support project interventions in terms of provision of land as necessary • are keen to have better market access • Need training on E&S issues • Want better connectivity
C: Market Development and Sector Stewardship	Farmers are keen to have market yards closer to produce rather than individual carry goods to distant markets
D: Project Management, Monitoring and Learning	Are keen for more crop management practices and expect departments to provide necessary support in terms of farm inputs and knowledge, training, exposure visits

8 Legal and policy framework

The Acts and policies related to Scheduled Tribes at the state level and national level were reviewed to ascertain their relevance to the project. The Table below below reviews the existing legislations and assesses their relevance to the project:

Table 57 Summary of Social regulations and their applicability to Project

-			
Legislation (Year)	**Objective**	**Provisions**	**Applicability to Project**
National level			
Article 366 (25) of the Constitution of India Article 244(1) of Constitution	Article 366 (25) refers to Scheduled Tribes as those communities, who are scheduled in accordance with Article 342 of the Constitution, wherein communities shall be declared as such by the President through an initial public notification or through a subsequent amending Act of Parliament. The Fifth Schedule under Article 244(1) of Constitution defines "Scheduled Areas" as such areas as the President may by order declare to be Scheduled Areas after consultation with the Governor of that State.	Defines following essential characteristics, for a community to be identified as Scheduled Tribes are; Indications of primitive traits; Distinctive culture; Shyness of contact with the community at large; Geographical isolation; and Backwardness. The criteria for declaring any area as a "Scheduled Area" under the Fifth Schedule are; (a) preponderance of tribal population, (b) compactness and reasonable size of the area, (c) a viable administrative entity such as a district, block or Taluka, and (d) economic backwardness of the area as compared to the neighbouring areas	**Applicable** as some of the project interventions would be in tribal dominated areas, besides in other areas where tribal population is dispersed
Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 and HP State level policies	aims to ensure, a humane, participative, informed and transparent process for land acquisition with least disturbance to the owners of the land and other affected families and provide just and fair compensation to the affected families whose land has been acquired or proposed to be acquired or are affected by such acquisition and make adequate provisions for such affected persons for their rehabilitation and resettlement and for ensuring that the cumulative outcome of compulsory acquisition should be that affected persons become partners in development leading to an improvement	The Act • defines affected family, interested persons, project area, • details process to define public purpose and social impact, steps towards notification and acquisition • provides institutions (Appraisal committee, R&R administrator, R&R Commissioner; National Committee for Monitoring for Rehabilitation and Resettlement; LARR Authority, etc.) • details factors for consideration to determine market value of assets; solatium & multiplication factors applicable; and infrastructural amenities at	**Not applicable** all project interventions are planned either on land already belonging to government/project implementing agencies or taken voluntarily from communities or on lease

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Legislation (Year)	**Objective**	**Provisions**	**Applicability to Project**
	in their post acquisition social and economic status	resettlement site; apportionment and payment of compensation	
Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	framed to recognize and vest the forest rights and occupation in forest land in forest dwelling STs and other traditional forest dwellers who have residing in such forests for generations but whose rights could not be recorded. Its main objective is to facilitate the overall development and welfare of the tribal people by empowering them socially, economically and politically without any impact on their culture, habitation and tradition and in terms of their age old rights and privileges.	The Act provides three kinds of rights to Scheduled Tribes and Other Traditional Forest Dwellers: Land Rights: Right to continue cultivating land (less than or equal to four hectares) where they have been cultivating prior to 13 December 2005; Use Rights: Provides for rights to use and/or collect a) minor forest produce (tendu patta, herbs, medicinal plants) that has been traditionally collected, b) Grazing grounds and water bodies, c) Traditional areas of use by nomadic or pastoralist Communities Right to protect and conserve. Gives the community the right to protect and manage the forest.	**Not applicable** as no such project activities are proposed at present. Further such locations, if any are planned would be included in negative list of project
National Policy on Tribal Development, 1999	It seeks to bring scheduled tribes into the mainstream of society through a multi-pronged approach for their all-round development without disturbing their distinct culture Development.	It lists out measures to be taken in respect of: formal education, traditional wisdom, displacement and resettlement, forest villages, shifting cultivation, land alienation, intellectual property rights, tribal languages, Primitive tribal groups, scheduled tribes and schedule areas, administration, research, participatory approach and assimilation	**Applicable** as the policy will be applicable to project activities across the state wherein dispersed population exist besides in certain tribal dominated districts.
Panchayati Raj Act 1953, 73rd Amendment 1994	The act leads towards village governance and establish the bottom up approach. The Panchayati Raj Institutions considered as self Government for rural areas whether at the level of a village or a block or a district.	The Act aims to provide a 3-tier system of Panchayati Raj for all States having a population of over 2 million, to hold Panchayat elections regularly every 5 years, to provide seats reservations for scheduled castes, scheduled tribes and women; to appoint a State Finance Commission to make recommendations regarding the financial powers of the Panchayats and to constitute a District Planning Committee, to prepare a development plan for the district. The 3-tier system of Panchayati Raj consists of: Village-level Panchayats;	**Applicable** as some of the demand-driven project interventions such as irrigation infrastructure would be subject to these provisions

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Legislation (Year)	**Objective**	**Provisions**	**Applicability to Project**
		Block-level Panchayats and District-level Panchayats. Besides, it indicates the powers and responsibilities and also sources of funds	
Extension of Panchayati Raj to Scheduled Areas (PESA) 1996	to cover the "Scheduled areas", which are not covered in the 73rd amendment or Panchayati Raj Act of the Indian Constitution.	Key provisions include: • state legislation on panchayats in the scheduled area should take care of the customs, religious practices and traditional management practices of community resources • Every village shall contain a grama sabha whose members are included in the electoral list for the panchayats at village level • Planning and management of minor water bodies are entrusted to the panchayats	**Applicable** as project interventions are planned in Scheduled Areas of the state and these provisions have been applicable to these areas since 1996
Right to Information Act, 2005	provides a practical regime of right to information for citizens to secure access to information under the control of Public Authorities.	The act sets out • obligations of public authorities with respect to provision of information; • requires designating of a Public Information Officer; • process for any citizen to obtain information/disposal of request, etc • provides for institutions such as Central Information Commission/State Information Commission	**Applicable** as all documents pertaining to the project would be disclosed to public
National Agricultural Policy, 2000	The National Policy on Agriculture seeks to actualise the vast untapped growth potential of Indian agriculture, strengthen rural infrastructure to support	Provides approach for sustainable agriculture, food and nutritional security, generation and transfer of technology; inputs management and incentives for agriculture, Generation and Transfer of Technology,	**Applicable** as project would comprise many of the features enunciated in the policy

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Legislation (Year)	**Objective**	**Provisions**	**Applicability to Project**
	faster agricultural development, promote value addition, accelerate the growth of agro business, create employment in rural areas, secure a fair standard of living for the farmers and agricultural workers and their families, discourage migration to urban areas and face the challenges arising out of economic liberalization and globalisation	management reforms, institutional structure	
National Policy for farmers, 2007	Sets goals such as to: (i) improve economic viability of farming by substantially increasing the net income of farmers and to ensure that agricultural progress is measured by advances made in this income. (ii) To protect and improve land, water, bio-diversity and genetic resources essential for sustained increase in the productivity, profitability and stability of major farming systems by creating an economic stake in conservation. (iii) To develop support services including provision for seeds, irrigation, power, machinery and implements, fertilizers and credit at affordable prices in adequate quantity for farmers., etc.	• defines farmers that include tribal families / persons engaged in shifting cultivation and in the collection, use and sale of minor and non-timber forest produce • prescribes assets reforms required to empower farmers such as land, water, livestock, • provides for support services including credit, climate change, agricultural practices, etc.	**Applicable** as project would comprise many of the features enunciated in the policy
State Level			
The Himachal Pradesh Transfer of Land (Regulation) Act, 1968	Objective is to ensure protection to tribes in respect of their possession of land	It provides that "No person belonging to an Scheduled Tribe transfer his interest in any land by way of sale, mortgage lease, gift or otherwise to any person not belonging to such tribe except with the previous permission in writing of the Deputy Commissioner,	The act is applicable as the act's coverage extends to whole districts of Lahaul and Spiti and Kinnaur and to the sub-tehsils of Pangi and Bharmour in

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Legislation (Year)	**Objective**	**Provisions**	**Applicability to Project**
		excepting i) by way of lease of a building on rent; ii) by way or mortgage for securing loan to any Cooperative land Mortgage bank or cooperative society (all or majority members belonging to any ST) or by acquisition by the state government under LA act". Right, title or interest held by persons belonging to Scheduled Tribes in land are not be attached except when the amount due under such decree or order is due to the state government or to any cooperative land mortgage bank or cooperative society.	Chamba district
Results Framework Document for Tribal Development Department (2015-16)	The vision of this RFD is to ensure Socio-economic development of Scheduled Tribe population with a view to bridge the Socio-economic gap between Scheduled Tribe and General population. The mission is to facilitate the up-gradation of levels of administration and improvement of socio-economic infrastructure in Scheduled Areas as well as tribal population concentrated areas through area and population targeted approaches with a view to empower the tribals socio-economically to be at par with general population with special emphasis for women.	The Annual RFD accords weightage, set of actions, success indicators and target ratings (Poor to Excellent) to each of the following functions: All matters relating to planning generally e.g. assessment of resources, formulation of plans, laying down of targets and physical aspects and co-ordination in relation to matters affecting the tribal areas and the Scheduled Tribes of the State. (TSP); Periodical assessment and evaluation of Plan activities in relation to matters affecting the tribal areas and the Scheduled Tribes of the State. (Tribal Advisory Council, PAC, Boards); All policy matters including introduction of new schemes affecting the tribal areas and the Scheduled Tribes and consultation thereof by all administrative departments with the Tribal Development Department. (Matters relating to Tribal Advisory Council; Matters relating to the Himachal Pradesh Transfer of Land(Regulation) Act,1968;; Administration and Control of Scheduled Areas and Scheduled Tribes including Single Line Administration; and Matters relating to Integrated Tribal Development Projects (ITDPs)	Applicable as this document would incorporate/support some of the project level interventions
Single Line Administration in ITDP areas of Kinnaur, Lahaul Spiti	To provide single line administration to the ITDP areas of the state	Provides for Deputy Commissioner/Additional DC to exercise all powers of Head of the departments in respect of all officers posted in their area	Applicable as project interventions are planned in these areas and implementation would be routed through the

-			
Legislation (Year)	**Objective**	**Provisions**	**Applicability to Project**
and Bharmaur, 1988			DC/ADC
The World Bank			
Operational Policy 4.10 on Indigenous Peoples	ensures that indigenous population benefits from development projects and those projects' potentially adverse effects are avoided or mitigated and prescribes elements for a tribal development framework or tribal development plan	The World Bank defines Indigenous Peoples (IPs) by the following criteria: Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories; Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; An indigenous language, often different from the official language of the country or region;and Identification by the Borrower Country as an Indigenous Group. It seeks the borrower to engage in a process of free, prior and informed consultation.	Applicable as project interventions are to take place in tribal areas of the state
World Bank's Policy on Access to Information	This Policy governs the public accessibility of information in the Bank's possession that is not on a list of exceptions	Policy is based on five principles • Maximizing access to information; • Setting out a clear list of exceptions; • Safeguarding the deliberative process; • Providing clear procedures for making information available; and • Recognizing requesters' right to an appeals process. The policy outlines a clear process for making information publicly available and provides a right to appeal if information-seekers believe they were improperly or unreasonably denied access to information or there is a public interest case to override	WB is required to disclose Project related information during preparation and implementation as per this policy

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Legislation (Year)	**Objective**	**Provisions**	**Applicability to Project**
		an exception that restricts access to certain information.	

9 Socio-economic profile of ST's in the state

Major tribal areas in the state are three major tribal districts - Chamba (comprising of 2 blocks of Pangi and Bharmour), Kinnaur and Lahaul Spiti. There are total of 10 communities as notified in State's Scheduled Tribes list namely, Bhot, Bodh, Gaddi, Gujjar, Jad, Lamba, Khampa, Kanaura (Kinnaura), Lahaula, Pangwala and Swangala. There are total of 10 communities as notified in State's Scheduled Tribes list namely, Bhot, Bodh, Gaddi, Gujjar, Jad, Lamba, Khampa, Kanaura (Kinnaura), Lahaula, Pangwala and Swangala.

Population: According to the Census 2011 the population of Himachal Pradesh is 6864602 of which 392126 (5.71%) belongs to Scheduled Tribes. Kinnaur (57.95%) and Lahaul-Spiti (81.44%) have the highest Schedule Tribe populations. **Table 60** presents population of Scheduled Tribes by districts.

Table 58 District wise population of Scheduled Tribes

S. No	District	Total	Nos.	%
1	Bilaspur	381,956	10,693	2.80
2	Chamba	519,080	135,500	26.10
3	Hamirpur	454,768	3,044	0.67
4	Kangra	1,510,075	84,564	5.60
5	Kinnaur	84,121	48,746	57.95
6	Kullu	437,903	16,822	3.84
7	Lahaul-Spiti	31,564	25,707	81.44
8	Mandi	999,777	12,787	1.28
9	Shimla	814,010	8,755	1.08
10	Sirmaur	529,855	11,262	2.13
11	Solan	580,320	25,645	4.42
12	Una	521,173	8,601	1.65
State Total		**6,864,602**	**392,126**	5.71
				Source: Census of India, 2011

The tribal population of H.P. as per Census 2011, can be divided into three categories as under:

i. *Scheduled Tribes in Scheduled Areas:* District of Kinnaur, Lahaul-Spiti, the two Sub-Division of District Chamba viz. Pangi and Bharmour have been declared as Scheduled Area because majority population comprise of communities declared as Scheduled Tribe under the Fifth Schedule of the Constitution. These tribal areas are very remote and inaccessible having tough mountainous terrain and inhospitable climatic conditions thus involving high cost of infrastructural development and harsh living conditions. They are also considered as five Integrated Tribal Development Projects (ITDP) areas. Hence, 31.52% of the State's tribal population falls under the Scheduled Areas of the State.

ii. *Modified Area Development Approach (MADA):* The ambit of Tribal Sub-Plan was expanded in the Sixth Five Year Plan and Modified Area Development Approach was adopted to cover smaller areas of tribal concentration having 10,000 population in contiguous areas of which 50% or more were tribal. In Himachal Pradesh two such pockets namely Chamba and Bhatiyat- Blocks of the District

Chamba were identified in 1981-82. These two pockets cover 7.51% Scheduled Tribes as per Census 2011.

iii. *Dispersed Tribes Population:* During the Seventh Five Year Plan the strategy of Special Central Assistance (SCA) to Tribal Sub-Plan was further extended to cover all tribal living outside the Scheduled Area and Modified Area Development Approach pockets for beneficiary originated programme out of funds released by the Union Ministry of Tribal Affairs under Special Central Assistance. Besides Scheduled Area and MADA Pockets. 239,086 (60.97%) population belonging to Scheduled Tribes are residing in Non-Tribal areas of the State.

As a whole, out of total ST population in the State, 68.51% resides outside Scheduled Areas of the State.

Table 61 elaborates on the population breakup of tribal population for areas outside the Scheduled Areas.

Table 59 Tribal Population outside of Scheduled Areas

Name of District	Total number of villages	No. of villages having more than 40% population %	% of Villages having ST population more than 100 persons but concentration is less than 40% of total population
Bilaspur	953	3.15	1.89
Chamba	1110	17.30	9.91
Hamirpur	1671	0.60	0.12
Kangra	3617	4.87	3.65
Kullu	314	1.59	11.78
Mandi	2850	0.91	0.88
Shimla	2705	0.52	0.30
Sirmour	968	1.24	1.76
Solan	2383	1.80	1.89
Una	790	1.39	1.39
Total	**17361**	**2.99**	**2.33**

Socio-economic parameters In the tribal areas, as per Census 2011 are **(See Table 62):**

Density of population per square kilometer: Density is the highest in Bharmour (22), Kinnaur (13) and Pangi (12) are followed by Lahaul (3) and Spiti (2). Concentration of tribals vis-à-vis total population is higher in Pangi (90.18%), Bharmour (82.12%), Spiti (84.64%) and Lahaul (79.36%) have higher concentration of tribals. Kinnaur (57.95%) has relatively less %age of Scheduled Tribes. Pangi and Bharmour tehsils along with Holi sub- tehsil constitute the tribal area of Chamba district giving the district its Ist rank in terms of population (135,500) of STs in the state.

Sex ratio: Amongst these five ITDP areas, Kinnaur (1065), Lahaul (1021) and Spiti (1010) have a higher ratio than the state figure (999).

Literacy: In terms of literacy rate, Lahaul (86.97%) has a literacy rate higher than the state literacy rate (82.80). The other four areas have rates ranging from 71.02 (Pangi) and 80 (Kinnaur). Chamba district is ranked 8th in terms of literacy

Land Holdings: Out of total geographical area of 23,65,533 hect., operational area is only 39,900 hect. i.e. 1.69% owned by 34,500 farmers. The average size of holdings in tribal areas is 1.16 hect. About 65 percent of the main workers are engaged in agriculture according to the 2001 census. Cultivated area per agriculture workers is 0.44 hect. only. Intensity of cropping varies from 100% to 146% average being 124.70% against 171% at State level. The low cropping intensity is due to the fact that mostly these areas are monocrop. About cent per cent cropped area in ITDP Lahaul and Spiti and 50% area in ITDP. Pangi is under irrigation. In ITDP Kinnaur and Bharmour, the irrigation facilities are scarce except in Pooh sub-division of district Kinnaur where sizeable area has been brought under irrigation through the Desert Development Project.

Agriculture: It is the largest industry and main occupation of the people in tribal areas of Himachal Pradesh. In these areas too, economy is primarily dependent on agriculture. E.g. crop season is limited to only six months due to severe cold and snowfall. In Lahaul Spiti too, 58.18% of the workers are engaged in this sector. It is the only district in the state engaged in cultivation of 'hops' and Kuth. Also it has attained fame in producing high quality potato crop and peas which are much in demand within and outside the country. The farming in tribal areas is highly agro-pastoral and most of the areas are monocarp areas. In these areas, the commercial crops are potato, rajmas, peas, bean and some vegetables such as cabbage, cauliflower and carrot, etc.

Total cropped area: Highest cropped area is recorded in Kinnaur with more than 9000 hectares of land followed by Bharmour with around 6000 ha of cropped area. Other areas are much lower ranging from 1200 to 2500 hectares.

Area under fruit crops: Area under fruit crops - by Apple and by other fruits are highest in Kinnaur (around 10,000 hectares and around 1,700 hectares), followed by Bharmour (4000 ha and 745 ha). Amongst other areas, Lahaul has 954 ha under Apple, while Pangi has 781 ha under Apple. Kinnaur district is famous for delicious apples which are directly marketed to different places of the country.

Table 60 Socio-economic parameters in Scheduled areas

S.No.	Item	Unit	Year	Tribal Areas						H.P.
				Kinnaur	Lahaul	Spiti	Pangi	Bharmour	Total	Total
1	2	3	4	5	6	7	8	9	10	11
1	Population	No.	2011	84121	19107	12457	18868	39108	173661	6864602
	Male	No.	2011	46249	9897	6691	9579	20109	92525	3481873
	Female	No.	2011	37872	9210	5766	9289	18999	81136	3382729
2	Geographical Areas	Sq.Km.	2011	6401	6250	7591	1595	1818	23655	55673
3	Density of Population per sq.km. area	No.	2011	13	3	2	12	22	7	123
4	Percentage of ST population to total population	%age	2011	57.95	79.36	84.64	90.18	82.12	71.16	5.71
5	Sex Ratio (ST)	No. of females per	"	1065	1021	1010	993	964	1018	999

S.No.	Item	Unit	Year	Tribal Areas						H.P.
		'000 males								
6	Literacy									
	a) Persons	%	"	80	86.97	79.76	71.02	73.85	77.1	82.8
	b) Males	%	"	87.27	86.5	87.37	82.52	82.55	85.5	89.53
	c) Females	%	"	70.96	64.5	70.74	59.27	64.67	67.41	75.93
7	Net irrigated Area	'000 Hect		5.554	2.203	1.214	1.301	0	10.272	
8	Gross irrigated area	'000 Hect.		4.943	2.203	1.23	0.045	0.68	9.101	
9	Area under fruit crops	'000 Hect.	2011-12	11.866	0.997	0.472	0.899	4.755	18.989	
10	Fruit Production	000MT	"	52.435	0.128	0.129	0.082	18.67	71.444	
11	Area under forests (Forest	000 Hect.		509.261	613.691	399.6	121.678	135.756	1779.986	
12	No. of Gram panchayats	No.	Nov., 2011	65	28	13	16	29	151	
13	No. of all types of Cooperative Societies	No.	"	90	131	64	14	30	329	
Source: Statistical Profile of Tribal Areas vis-à-vis Himachal Pradesh, 2014-15										

Workforce participation: Chamba district stands 5th in terms of its working force having total workers of 294,035 persons against 3,559,422 working persons of the state. Also it has returned 66.88% persons as cultivators out of the total working population. In all three districts % of those engaged in agriculture is expectedly more than sixty percent. A significant percentage i.e. one-third or more than one-third are engaged are other workers i.e. workers outside of agriculture or household industry.

Table 61 District-wise workforce participation

-			
	Kinnaur	**LS**	**Chamba**
Main	83.13%	78.73%	40.69%
Marginal	16.87%	21.27%	59.31%
Total	56273	19295	294035
Cultivators	58.63%	58.19%	66.88%
Agriculture labour	7.69%	2.96%	3.13%
Household industries	1.68%	0.87%	1.54%
other workers	35.18%	37.98%	28.45%
Source: District Handbooks, Chamba, Kinnaur and Lahaul -Spiti, 2011			

10 Ongoing government Schemes for Tribals

Government schemes for Tribals can be classified into Central government and state government schemes. These are presented below:

10.1 Central government support/schemes

Special Central Assistance (SCA) is intended to be additive to State Plan efforts for tribal development and forms part of TSP strategy. The objective of the strategy is two folds: i) socio-economic development of STs; and ii) Protection of trials against exploitation.

Of the above, SCA primarily funds schemes/projects for economic development of STs. Guidelines for SCA state that SCA is primarily meant for income generating family oriented schemes and infrastructure incidental thereto (not more than 30% of the total outlay). Wherever a scheme is provided for any Central Sector/Centrally Sponsored Schemes (CSS), SCA should not be utilised for the same. Rather, the allocations available under specific schemes can be availed of. Major infrastructure development should be supplemented from the TSP flow, rather than being catered out SCA like roads, electrification etc. Schemes for funding demonstration units should not be financed out of SCA. Rather, the follow-up of demonstrations should be catered to looking to the Special disadvantages that the tribal funds themselves with. Tribal population below poverty line should alone be supported with SCA financed activities.

In any specific schematic projects financed by outside agencies, both national and international, normally a part of the outlay is proposed as State Government contribution. Such contribution should flow from normally State Plan and not out of SCA. Specific sectors related to the Tribal need to be givers a fillip by special schemes in the areas like sericulture, horticulture, etc out of SCA. Wherever conjunctional flow of funds can be ensured from other on-going development programmes, this must be dovetailed so as to have a better spatial and demographic coverage. SCA is released for the economic development of the following

a) Integrated Tribal Development Project (ITDP) area contiguous large area in which ST population is 50% or more out of a total population.
b) Modified Area Development Approach (MADA) pockets identification of pockets containing 50% or more of ST population out of a total population of 10000 and above
c) Clusters-identified pockets containing 50% or more ST Population out of a total population of 5000.
d) Primitive Tribes-identified isolated communities among the STs charactarised by the low rate of population, pre-agricultural level of technology and extremely low levels of literacy (so far 75 Primitive Tribal Groups (PTGs) have been identified.
e) Displaced tribal population outside (a),(b),(c) and (d) above.
f) Assistance for Margin Money Loan Programme (MMLP) for Tribal Finance and Development Corporations in the States to implement MMLP.
g) Special Projects-Specific Project proposals are also received and sanctioned.

Current schemes in Himachal Pradesh under CSS: Table 64 presents the types of schemes currently operational in the state with SCA.

Table 62 Funding Pattern under SCA and types of Scheme

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Central Sector Schemes under which	Types of schemes
100% Assistance is given to State/ UTs & Govt. of India under taking:	1. SCA for TSP. 2. Grants under First Proviso to Article 275 (1) of the Constitution. 3. TRIFED. 4. Establshment of Grain Banks in Tribal Villages.
matching (50:50) Assistance is given to State:	5. Construction of Girls Hostels for Scheduled Tribes. 6. Construction of Boys Hostels for Scheduled Tribes. 7. Esstt. of Ashram Schools in Tribal Sub-Plan Area. 8. Research and Training
cent per cent assistance is given to States/ UTS and NGOs:	9. Vocational Training in Tribal Areas.
bifurcated from Ministry of Social Justice & Empowerment from 2000-2001:	10. Post Matric Scholarship to the students belonging to Scheduled Tribes for studies in India
	Source: Tribal Development Department, Government of Himachal Pradesh

Support specific to Horticulture: Under the Central government's Mission for Integrated Development of Horticulture (MIDH), tribal areas and STs are benefitted and could be dovetailed under the project. Some of the schemes are listed in **Table 65** below

Table 63 Provisions for Tribals under MIDH scheme

Item	Pattern of Assistance
Plantation Infrastructure Development	
Open pollinated crops	50% in Himalayan States, Tribal Sub Plans (TSP) areas,, limited to 5 ha.
Hybrid seeds	50% in Himalayan States, TSP areas, limited to 5 ha. Output target of seed for each crop will be fixed by the individual state for each beneficiary, before releasing funds
Horticulture Mechanization	
Tractor (upto 20 PTO HP)	25% of cost, subject to (in case of ST, 35% of cost, subject to a maximum of Rs. 1.00 lakh per unit)
Power tiller (below 8 BHP)	Subject to a maximum of Rs.0.50 lakh/unit for ST
Power tiller (8 BHP & above)	subject of a maximum of Rs. 0.75 lakh/unit.
Land Development, tillage and seed bed preparation equipments	subject of a maximum of Rs. 0.15 lakh/unit.
Sowing, planting reaping and	subject of a maximum of Rs. 0.15 lakh/unit

Item	Pattern of Assistance
digging equipments	
c) Plastic mulch laying machine	subject of a maximum of Rs. 0.35 lakh/unit.
Self-propelled Horticulture Machinery	subject of a maximum of Rs. 1.25 lakh/unit.
Integrated Post Harvest Management	
Integrated pack house with facilities for conveyer belt, sorting, grading units, washing, drying and weighing.	Credit linked back-ended subsidy @ 50% of cost in case Hilly & Scheduled areas for individual entrepreneurs.
Pre-cooling unit; Cold room (staging,); Mobile pre- cooling unit	
Cold Storage (Construction, Expansion and Modernisation)	
Cold storage units Type 1 and 2 - basic mezzanine structure with large chamber (of >250 MT) type with single temperature zone	Credit linked back-ended subsidy @ 50% of cost in case Hilly & Scheduled areas, per beneficiary.
Cold Storage Units Type 2 with add on technology for Controlled Atmosphere	
Establishment of marketing infrastructure for horticulture produce in government/private and cooperative	
Wholesale markets	Credit linked back-ended subsidy@33.33% in Hilly and Scheduled areas
Rural markets/apni mandies/direct markets	Credit linked back-ended subsidy@55% in Hilly and Scheduled areas, per beneficiary
Gravity Operated ropeway in hilly areas	Credit linked back ended subsidy @50% of capital costs in Hilly areas
Source: Operational Guidelines, Mission for Integrated Development of Horticulture	

10.2 State level schemes

The state level schemes for tribal areas are planned under the overall tribal sub-plan of the state. The basic objective of the Tribal Sub-Plan is to allocate government resources equitably between the overall population and tribal population. The Tribal Development Department prepares the Tribal Sub-plans with inputs from all state departments. Under this new system, the State Planning department communicates 9% ceiling of the total State Plan outlays to the Tribal Development Department who in turn allocate the divisible outlays to each of the ITDP viz. Kinnaur, Lahaul, Spiti, Pangi and Bharmour. The indivisible outlays in the nature of grant-in-aid etc. are conveyed to the Administrative departments. Each ITDP has its own needs and requirements as such each ITDP shall be free to determine its own

priorities and allocate funds only to those schemes which are relevant to the area. Each ITDP shall prepare its plan in consultation with the concerned Project Advisory Committee headed by the respective Hon'ble MLA of the area. The Tribal Sub-Plan in respect of ITDP prepared in consultation with the Project Advisory Committee are compiled by the Tribal Development Department in consultation with Heads of implementing departments and dovetailed in the main Tribal Sub-Plan.

For equitable flow of funds to the 5 ITDPs, the State has evolved an objective formula based on 40% population, 20% area and 40% relative economic backwardness of each ITDP. Based on this formula, the share of each ITDP is as under:- Kinnaur (30%), Lahaul (18%), Spiti (16%), Pangi (17%) and Bharmour (19%).

Some of the schemes relating to Agriculture, Horticulture and rural development included in the 2015-16 plan are given below:

Agriculture

- Distribution of agriculture implements tools and machinery on 50% subsidy basis.
- Distribution of seed including high-yielding variety seed on 50% subsidy.
- Supply of insecticides, pesticides and other plant protection material on 50% subsidy basis.
- Distribution of minikits free of cost.
- Distribution of tarpaulins on 50% subsidy
- Soil & Water Conservation measures for construction of water harvesting structure.
- Distribution of fertilizers on subsidy basis.

Horticulture

- Supply of fruit plants on 50% subsidy basis
- Supply of insecticides, fungicides and other plant protection material on 50% subsidy.
- Supply of horticulture tools and machinery on 50% cost.
- Package programme on different fruit crops

Rural Development

- Supply of milch cattle on 50% subsidy basis.
- Supply of agricultural/Horticultural machinery on 50% subsidy basis;
- Supply of Sheep and goat units on 50% subsidy;
- Supply of pack animals on 50% subsidy basis;
- Training to rural youths to provide them technical skill to take up self-employment

In addition, state schemes involving financial assistance are implemented through HPSCSTC.

Table 64 List of Schemes under HPSCSTC for Scheduled Tribes

Name	Brief description
Swarojgar Yojna (Self-Employment Scheme)	Financial Assistance up to Rs.50,000/- for setting up & expansion of Income generating avocations.
Himswablamban Yojna (NSFDC & NSTF DC)	To provide loans for Projects Costing more than Rs.50,000/- in collaboration with NSFDC and NSTFDC
Study Loan	To provide loan upto Rs.1,50,000/- for a full course of five years
Dalit Varg Vayavsaik	To provide training to the SC and ST youth in traditional and non-traditional

Name	Brief description
Prashikshan Yojna	trades through ITI/ Private Institution/ Master Craftsman
Construction of Shop/Shed Scheme (Laghu Vikray Kendra Yojna)	Corporation Provides Loan to the MunicipalCorporation/ Municipal Committees/ Nagar Panchayats/ Blocks Samitis/ GramPanchayats for Construction of Shops/Sheds for SC's/ST's .
Hast Shilp Vikas Yojna	Corporation provides working capital assistance up to Rs.5000/- to individual as well as Group/ Society/Association of artisans.
Small Business Yojna (NSTFDC)	To meet the small Financial need of poor Scheduled Tribes families to start small and petty business individually, the term loans assistance up to Rs 50,000/- is provided by the Corporation directly in collaboration with NSTFDC.
National Safai Karamcharis Finance & Development Corporation (NSKFDC)	Financial assistance to set up any income generating activity of higher cost i.e. above Rs. 50000/- on concessional rate of interest such as small business unit, Taxi, Mahindra Jeep, Tata Sumo, Shuttering, Piggery farm etc.
Micro Credit Finance (MCF)	Provide Loans up to Rs.50,000/- under Small Loan Scheme
	Source: HPSCSTC website, GOHP

11 Existing Institutional Arrangements

There are two main bodies - Tribal Development Department and HPSCST Corporation, besides advisory council and project committees. Details are presented below.

1. **Tribal Development Department**. It came into existence in June, 1976 with the objective/purpose to give special focus on the social and economical upliftment of most deprived class of society i.e Scheduled Tribes. The business of department relates to:
   - All matters relating to planning generally e.g. assessment of resources, formulation of plans, laying down of targets and physical aspects and co-ordination in relation to matters affecting the tribal areas and the members of the Scheduled Tribes of the State.
   - Periodical assessment and evaluation of Plan activities in relation to matters affecting the tribal areas and the members of the Scheduled Tribes of the State.
   - All policy matters including introduction of new schemes affecting the tribal areas as also matters relating to the members of the Scheduled Tribes consultation thereof by all administrative departments with the Tribal Development Department.
   - Initiation of any proposal concerning any other department in relation to matters affecting the tribal areas or the members of the Scheduled Tribes of the State after due consultations and agreements with the concerned departments.
   - Tendering advice to all departments in relation to matters affecting the Tribal areas and the members of the Scheduled tribes of the State.
   - Overall co-ordination and evaluation of all activities of any department in relation to the matter affecting the tribal areas and the members of the Scheduled Tribes of the State.
   - Tribal Advisory Council.
   - Integrated Tribal Development Projects.
   - Establishment, budget and accounts matters of the Tribal Development Department.

In case of the tribal areas in the State have well-defined administrative units. The ITDP Kinnaur comprises the whole district; the ITDP Lahaul comprises tehsil Lahaul and tehsil Udaipur and the rest of the three ITDPs are by the name of Spiti, Pangi and Bharmour (now sub-tehsil Holi and tehsil Bharmour) comprise tehsils by the same name.

- **Single Line- Administration in ITDP areas:** From 15th April, 1988, Single line administration was effective in all five ITDP areas i.e Kinnaur, Lahau-Spiti, Bharmour and Pangi. It implied that Deputy Commissioner (DC)/Additional DC would exercise all powers of the Head of the Department in respect of all officers upto the Divisional level i.e. Executive Engineer, Deputy Conservator of Forests posted in their areas. In other words, the Deputy Commissioner, who more due to single line administration is not only District Magistrate and Collector but for all intents and purposes is also the head of all the district level offices. In addition to the usual and traditional role as Deputy Commissioner he has multifarious duties. As Deputy Commissioner, he is the executive head of the District looking after development, Panchayats, local bodies and civil administration. As District Magistrate, he is responsible for the maintenance of law and order and is the head of Police and prosecuting agency in the district. As Collector he is at the apex of the revenue administration and is responsible for the collection of land-revenue and all dues recoverable as arrears of land-revenue. He is also revenue-applause authority. He ensures the successful execution of plan-schemes and co-ordinates the functions of all development departments and in fact due to the peculiar circumstances and situation of the area his functions are largely those of a Development Officer.. In addition to the above the Deputy Commissioner has been invested with so many other administrative and financial powers. He can effect transfers of non-gazetted staff within the district in respect of staff of all the departments. The development schemes of various departments have also to route through the Deputy Commissioner.

Other existing bodies are described hereunder:

- **Tribal Advisory Council**: Under the provision of Article 244(1) read with Part B-paragraph 4 of the Fifth Schedule to the Constitution of India, a Tribes Advisory Council has been constituted in the State since 13.12.1977 and having its meeting twice a year. The Tribes Advisory Council consists of 20 members including the Chairman (Chief Minister). Though the Council is advisory in nature by convention its recommendation are by and large accepted by the Government or dropped by the Council itself, after the deliberation. Apart from advising on matter referred to it, it oversees implementation of the tribal sub-plan in the State.

- **Project Advisory Committees**: These have been constituted for each of the five Integrated Tribal Development Project headed by the local MLA and of which Members of Parliament representing the area, Chairman Zila Parishad, Vice Chairman Zila Parishads, Chairman Panchayat Samiti(s), Vice-Chairman Panchayat Samities, One elected member of Zila Parishad of each ITDP, Two Gram Panchayat Pardhans nominated by the Chairman of respective ITDP from each development Block of concerned ITDP for period of two years, Members of T.A.Cs from the area and all Heads of Offices of Project including Officers of the State Govt. Undertakings in the area concerned with Tribal Sub-Plan. The R.C./D.C./A.D.C. is the Vice-Chairman of the Committee. The Project Officer ITDP, will be the Member Secretary of the Committee. The Committee looks after formulation as well as implementation and review of the sub-plan at the Project level and also the dispensation under nucleus budget funds.

2. **Himachal Pradesh Scheduled Castes and Scheduled Tribes Development Corporation** was established on 14th November, 1979. Initially this corporation was established solely to uplift economic status of the Scheduled Caste families but later in 1984 the Government of Himachal Pradesh and Government of India decided to entrust the work of providing financial assistance to Scheduled Tribe families of Himachal Pradesh to this corporation, as such the nomenclature of corporation was changed to "Himachal Pradesh Scheduled Castes And Scheduled Tribes Development Corporation". It is headed by a Chairman, supported by a Vice-Chairman, has a board of directors, managing director, general manager with district level offices at each district and also for specific blocks.

12 Tribal Development Framework

The TDF would comprise the following key features:

i. Awareness generation vide Free Prior and Informed Consultations: It would involve conducting of FPICs, with tribal communities to generate awareness on the project and assess interest and demand for any project interventions. For this purpose, suitable culturally compatible IEC materials would be prepared/used. These would be undertaken at all stages of the project i.e. while preparing and later implementing TDP to effectively reach out to the communities. During these FPICs, broad community support to the proposed interventions will be documented **(See Annexure 8.2 for indicative format for FPIC)** For this purpose, community mobilizers, preferably locals would be engaged. Participatory instruments such as Transect Walk, etc. would be deployed.

ii. Socio-Economic Baseline to enable selection of clusters: The project would undertake a socio-economic baseline of all tribal clusters wherein project interventions would take place. It would enable to accord priority in selection for areas (of non-tribals) with higher proportion of tribals. particularly in non-tribal area or clusters where demand for any project intervention is recorded. These would be undertaken by the M&E consultant within the first six months of project implementation.

iii. Preparation and implementation of TDP: As there could be project interventions in non-tribal areas or areas having lower tribal population, a screening exercise would be carried out to assess if indigenous peoples are present in the project area and possess the following characteristics as defined in OP 4.10:

- self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
  collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
- customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
- an indigenous language, often different from the official language of the country or region.

If the communities meet the above characteristics, particularly in non-tribal areas, a social assessment requires to be carried out. The social assessment is intended to evaluate the project's potential positive and adverse effects on indigenous people and to explore various measures which avoid adverse effects. If such measures are not feasible, the project would identify minimization or mitigation measures and should ensure that indigenous peoples receive culturally appropriate

benefits under the project. The results from the screening process would determine whether a TDP would required to be prepared.

iv. Representation: Efforts would be made ensure inclusion of small and marginal farmers and also women in any project intervention. Adequate representation for women and tribals would be ensured in any of institutions formed under the project such as FIGs, FPOs, WUAs, etc. Inclusion of Scheduled Tribes (men and women) in farmer organizations and their federations, especially in non-tribal areas would be ensured. In tribal-dominated areas, such bodies would be headed by tribal leaders. Also such representation would be ensured in any training, exposure visits, etc.

v. Special Provision for Community needs: As such hard and backward areas could have specific community needs (e.g. ropeway for access, farm equipment, etc.) there would be a special corpus of funds at the PCU level that could be accessed based on business plans submitted by FIGs/WUAs or any specific needs as identified and recorded during FPICs conducted in these areas. Process for the same would be as follows:

In selected habitations, BIU shall hold FPIC to ascertain any community need(s). The communities will decide as to what type of community need is needed in their habitation unanimously. A resolution in this regard will be passed by the community following the official procedure which will then be submitted to the BIU The resolution shall contain details

i. on the nature and type of community work requested;
ii. the likely benefit accrued;
iii. an approximate number of persons who shall benefit from it;
iv. consensus reached amongst the community members on the activity; and
v. Post construction i.e. O&M measures by the community
vi. finally a statement of proposed support and cooperation for the activity with signatures (or thumb-impressions) of the participants

Upon receipt of such requests, the BIU and DIU would: i) assess funds required from under the project to support the same and ii) identify existing schemes for convergence and then forward the same to PCU. The forwarded application shall comprise:

i. Planned community welfare work (s)
ii. Location and population of the village,
iii. Cost of the activity
iv. Intended and likely benefit
v. details on convergence of schemes, if any
vi. Procurement plan for materials
vii. Likely duration for execution of the work(s)
viii. Number of labor required
ix. Details of Minutes of meeting and resolution passed by the village,
x. Design required, if any

vi. Continued Focused support: As such tribal communities, besides conducting FPICs, additional and continued handholding would be provided through the Community mobilizers, facilitators, Subject Matter Specialists (SMS), Horticulture Extension Officer (HEO). There would be fortnightly meetings, at least or even more frequently as per need.

vii. Training and exposure visits: Customized training modules (WUA guidelines, grievance resolution, use of farm inputs, implements, pesticides, fumigants, etc.) would be prepared and imparted n a culturally appropriate manner. Besides exposure visits would be suitably identified and organized.

viii. Capacity Building: Personnel - SMS, HEO, HDO, SDS, SDC, involved from PCU, BIU, DIU and other agencies would be oriented on tribal development and social safeguards issues, prior to commencing work in these areas.

ix. External Support for preparation of TDP: As the department has limited exposure to safeguard requirements or in preparation of such plans, its capacity would be augmented by provision of an External Consultant for an initial period of 2-3 years. Once adequate capacity is built within the line departments, TDP - preparation would be undertaken in house i.e. by the line department.

x. Convergence with existing tribal schemes:As there exists many central sponsored and state level schemes, the Social Development Personnel at PCU and DIU will identify such schemes, inform the communities and promote convergence in so as to have a better spatial and demographic coverage and thereby maximize benefits from such intervention.

xi. Monitoring: In non-tribal areas, monitoring of project interventions would specifically include parameters relating to tribals (men and women) and amongst by size of farmer - small, marginal, medium.

xii. Grievance redressal arrangements: Grievance redressal mechanism in tribal areas would be headed a tribal while in non-tribal areas would ensure adequate representation with at least one tribal (man or woman)

13 Process in preparation of a Tribal Development Plan

As stated in section above, the results from the screening process would determine whether a TDP would required to be prepared. Step wise process to prepare TDP is presented below (for content outline of TDP, refer to Annex IX):

Table 65 Steps in preparation of TDP and by responsibilities

No.	Steps	Responsibility
0	Review findings from Screening exercise	SDC, PCU & SD, DIU
1	Undertake review of secondary data available	
2	Hold a Free prior and informed consultation to gauge community support to the project	SD, DIU, SMS, HEO and External consultant
3	Record Support or community opinion on the project	SD, DIU & M&E and External consultant
4	Conduct primary household survey to list project households for Socio-economic profile including: land-holding, literacy level and health status, sources of income, items of expenditure, migration status, indebtedness, expected benefits, anticipated support and impacts from the project	
5	List specific project impacts (both positive and negative) by households, tribal group and also segregated by gender	

No.	Steps	Responsibility
6	Inform households of the project of available mitigation measures as per TDF and convergence with other existing programs	SD, DIU, SMS, HEO and External consultant
7	Prepare TDP report as per outline (see AnnexureIX)	External consultant & SD, DIU
8	Send and seek approval of TDP - Draft report from Social Development Coordinator at PCU level	SDC, PCU
9	Hold another round of consultation to inform communities /disclose TDP	SD, DIU, HEO and External consultant

14 Institutional Arrangements for TDF

The implementation of TDF (including preparation and implementation of TDP) will be undertaken in accordance with overall project implementation schedule. As per the proposed institutional arrangements, there would be Social Development Coordinator at the Project Coordination Unit level at the state level. S/he would be supported by a Social Development Specialist at the District level, who in turn would be supported by the Horticulture Development Officer at the District Implementation Agency (DIU) and Horticulture Extension Officer (HEO) and Subject Matter Specialist (SMS) at the Block Implementation Agency (BIU). Community Mobilizers as necessary would be involved in preparation and implementation. Roles and responsibilities of these officers are listed in **Table 68** below:

Table 66 Implementation Responsibilities for TDF

Official by Level	Roles and responsibilities
State Level (Project Coordination Unit)	
Social Development Coordinator	• overall responsibility for implementation of TDF (and SMF) rests with the Social Development Coordinator within the PCU; • liaise with Tribal Development Department, Tribal Advisory Council and HP SCST Development Corporation as necessary; • provide orientation, training to concerned personnel of DIU and BIU on TDF provisions; • undertake field visits and participate in FPIC consultations periodically; • in respect of TDP, review findings from screening exercise, review and approval of TDP prepared by DIU; • organize exposure visits as necessary; • promote convergence /dovetailing of existing schemes with project interventions; and • contribute to internal monitoring of TDF implementation
External Consultant (for preparation of TDP)	• Provide support to PCU,DIU and BIU in preparation of TDP • participate in FPICs conducted at identified project locations

Official by Level	Roles and responsibilities
	• provide inputs, orientation and requisite training towards building capacity for the personnel of the project implementing agencies.
District Level (District Implementation Agency)	
Social Development Specialist	• responsible for implementation of TDF (and SMF); • participate, interact, consult with all level district level stakeholders on preparation and implementation of annual activities; • participate in training provided by PCU on TDF provisions; • undertake field visits; • participate in FPIC consultations - planning and implementation; • in respect of TDP, initiate screening exercise, review its findings and initiate preparation of TDP and seek/obtain approval from PCU; and in disclosure of TDP; • promote convergence /dovetailing of existing schemes with project interventions; and • provide support to PCU in internal monitoring of TDF implementation by reporting on a quarterly basis
Block Level (Block Implementation Agency)	
Horticulture Extension Officer	• Provide support as necessary to HDO and also to the SDS at the DIU in implementation of TDF such as: o provide necessary information towards screening exercise and subsequent preparation and implementation of TDF o participate in FPICs organized by the DIU and BIU o contribute to implementation of TDF o contribute to the overall citizen engagement, inclusion of the project and grievance redressal, • provide support to BIU and DIU in internal monitoring of project implementation (including TDF) by reporting on a quarterly basis;
Subject Matter Specialist	• provide support in implementation of TDF as necessary; • participate in FPICs during preparation of TDP; • respond to queries, complaints on the subject matter and thereby contribute to the grievance redressal; and • propose /provide support as necessary in sharing of ideas through exposure visits, trainings, etc.
Community Mobilizers (preferably local tribals)	• mobilize communities, create awareness on the project • communicate information regarding TDF;

Official by Level	Roles and responsibilities
	• generate demand by holding multiple consultations, if required; • organize FPICs, FGDs with special groups as necessary; • record meeting discussions and thereby support SDS (DIU) in preparation and implementation of TDPs; and • provide support to monitoring and evaluation exercises and grievance redressal

15 Monitoring of TDF

Monitoring of TDF would be consistent with the overall M&E under Component D and its overall responsibility would lie with the PCU at the State Level. In this it would be supported by DIU and BIU. It would be responsible to monitor the project along agreed monitoring indicators. PCU would be specifically be responsible for:

- analysis of all project-level M&E information and generation of regular 6-monthly M&E reports;
- updating key performance indicators by consolidating information provided by the different implementing agencies;
- conducting independent field visits to monitor implementation and outputs of selected project activities;
- maintaining the Project Monitoring Database
- identifying bottlenecks and suggesting corrective actions, as necessary;
- documenting processes and progress of project;

Specifically on TDF, the PCU would be responsible to:

- **monitor progress against the baseline survey** (including household survey undertaken for preparation of TDP in Tribal Areas) with social/tribal groups and gender disaggregated data of tribal and non-tribal beneficiaries.
- **undertake a process monitoring study** for assessment of project processes - specific to ESMF implementation (to be conducted by contracted external agency). It would include process followed in formation of FIGs, FPOs, WUAs, preparation and implementation of TDP (including conducting of FPICs), implementation of TDF; process followed by implementing agencies and recommend suggestions in terms of capacity, processes, etc.
- **supervise impact evaluation studies** in respect of implementation of ESMF, to be undertaken by a external agency. The purpose of these studies would be evaluate the implementation of the ESMF's in view of achievement of the project development objectives. These would be undertaken twice during the course of the project - at mid-term (around the Mid-term review of the project) and suggest corrective measures, if any are required to improve effectiveness. The second study would be conducted at end-term i.e. at project completion stage to ascertain overall performance of the ESMF. The impact evaluation studies would cover project implementation in tribal areas as well.

16 Reporting

The PCU would submit to the World Bank, six-monthly reports that would include the following details specific to social issues:

- socioeconomic environmental impacts of the project;
- progress on ESMF & TDF implementation including processes followed, with specific reference to women and tribals; and
- issues and constraints faced in ESMF andTDF implementation

17 Budget for implementation of TDF

Key elements of the budget include provision of an External consultant for an initial period of 2-3 years, conducting of FPICs, preparation and dissemination of culturally appropriate IEC material, training and exposure visits as planned and budget for provision of any special community needs as may be identified during implementation. **Table 69** presents the budget to implement the TDF:

Table 67 Budget for Implementation of TDF

	Item	Unit	No.	Rate	Amount
1	Engagement of Additional Resource Persons	LUM			1000000
2	Actual Project investments	LUM			
3	Provision of External Consultant (at PCU level) to help preparation of TDP for period of 36 months (across all Tribal & non-Tribal Areas	Monthly	36	75000	2700000
4	Conducting FPICs (vehicle, fuel, photography, videography)	LUM at 3 lakhs / year for 7 years			2100000
5	IEC material	Per district	3	300000	900000
6	Training and Exposure visits	LUM	5	200000	1000000
7	Budget for Community needs*	LUM	6	1000000	6000000
	Chamba district 3 (2 tehsils and 1 subtehsil)				
	Kinnaur district (3 CD blocks)				
	Lahaul Spiti (2 CD blocks)				
8	Budget for GI Certification for Organic farming	LUM		5000000	5000000
	Total				18700000
**** provision would be made under Component A of the project***					