Document of
The World Bank

FOR OFFICIAL USE ONLY

Report No: PAD1220

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF
US$ 80 MILLION

TO THE

REPUBLIC OF ECUADOR
FOR THE

SUSTAINABLE FAMILY FARMING MODERNIZATION PROJECT

June 10, 2015

Agriculture Global Practice
Bolivia, Ecuador, Peru, and Venezuela Country Management Unit
Latin America and the Caribbean Region

CURRENCY EQUIVALENTS

(The U.S. dollar is the official currency of Ecuador, effective January 2000)

Currency Unit = U.S. dollar
US$1 = US$1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AECID	Spanish Agency for International Development Cooperation	*Agencia Española de Cooperación Internacional para el Desarrollo*
BMS	Beneficiary Monitoring System	*Sistema de Seguimiento por parte de los Beneficiarios*
CDD	Community Demand Driven	*Basado en la Demanda de la Comunidad*
EOD	Decentralized Operational Entity	*Entidad Operacional Descentralizada*
EIRR	Economic Internal Rate of Return	*Tasa Interna de Retorno Económico*
ENPV	Economic Net Present Value	*Valor Presente Neto Económico*
ESMF	Environmental and Social Management Framework	*Marco de Gestión Ambiental y Social*
EX-ACT	Ex-Ante Carbon-balance Tool	*Instrumento de análisis Ex-Ante del balance de carbón*
FAO	Food and Agriculture Organization	*Organización para la Agricultura y la Alimentación*
FIRR	Financial Internal Rate of Return	*Tasa Interna de Retorno Financiero*
FM	Financial Management	*Manejo Financiero*
FNPV	Financial Net Present Value	*Valor Presente Neto Financiero*
GADP	Autonomous Decentralized Provincial Governments	*Gobiernos Autónomos Descentralizados Provinciales*
GDP	Gross Domestic Product	*Producto Interno Bruto (PBI)*
GoE	Government of Ecuador	*Gobierno de Ecuador*
GHG	Greenhouse Gas	*Gases de Efecto de Invernadero*
IBRD	International Bank for Reconstruction and Development	*Banco Internacional de Reconstrucción y Fomento (BIRF)*
ICR	Implementation Completion Report	*Informe de terminación de proyecto*
IPPF	Indigenous Peoples' Planning Framework	*Marco de Planificación de Pueblos Indígenas*
RPF	Resettlement Policy Framework	*Marco de Política de Reasentamiento*
ISN	Interim Strategy Note	*Nota de Estrategia de País Interina*
MAGAP	Ministry of Agriculture, Livestock, Aquaculture and Fisheries	*Ministerio de Agricultura, Ganadería, Acuacultura y Pesca*
M&E	Monitoring and Evaluation	*Seguimiento y Evaluación*
NGO	Non-Governmental Organization	*Organización No Gubernamental*
NPV	Net Present Value	*Valor Presente Neto*
OP/BP	Operational Policies/ Bank Procedures	*Políticas Operacionales/ Normas de Procedimientos del Banco*
OM	Operational Manual	*Manual Operativo*

O&M	Operation and Maintenance	*Operación y Mantenimiento*
PDO	Project Development Objective	*Objetivo de Desarrollo del Proyecto*
PIDD	Investment for Productive Development Project (Chimborazo)	*Proyecto de Inversiones para el Desarrollo Productivo (Chimborazo)*
PIU	Project Implementation Unit (Central Unit in Quito + 7 Zonal Offices)	*Unidad de Gestión del Proyecto (UGP) incluyendo la Unidad Central en Quito + las 7 Oficinas Zonales*
RFP	Request for Proposal	*Pedido de Propuesta (PP)*
SENAGUA	National Secretariat of Water	*Secretaría Nacional del Agua*
SENPLADES	National Secretariat of Planning and Development	*Secretaría Nacional de Planificación y Desarrollo*
SRD	Under-Secretariat of Irrigation and Drainage	*Sub Secretaría de Riego y Drenaje*
ToR	Term of Reference	*Términos de Referencia*
UPA	Agricultural Production Unit	*Unidad de Producción Agrícola*
WUA	Water Users' Association	*Asociaciones de Usuarios del Agua/ Juntas de Regantes*
WB	World Bank	*Banco Mundial*
ZO	Zonal Offices	*Oficinas Zonales*

Regional Vice President:	Jorge Familiar
Country Director:	Alberto Rodriguez
Senior Global Practice Director:	Juergen Voegele
Practice Manager:	Laurent Msellati
Task Team Leader:	Rémi Trier
Co- Task Team Leader:	Jorge Trevino

ECUADOR
SUSTAINABLE FAMILY FARMING MODERNIZATION
PROJECT

TABLE OF CONTENTS

PAD DATA SHEET

Ecuador

Ecuador - Sustainable Family Farming Modernization Project (P151963)

PROJECT APPRAISAL DOCUMENT

LATIN AMERICA AND CARIBBEAN

AGRICULTURE GLOBAL PRACTICE

Report No.: PAD1220

Basic Information			
Project ID P151963	EA Category B - Partial Assessment		Team Leader(s) Rémi Trier Jorge Trevino (co TTL)
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]		
Project Implementation Start Date 07-Dec-2015	Project Implementation End Date 07-Dec-2020		
Expected Effectiveness Date 07-Dec-2015	Expected Closing Date 30-Jun-2021		
Joint IFC No			
Practice Manager/Manager Laurent Msellati	Senior Global Practice Director Juergen Voegele	Country Director Alberto Rodriguez	Regional Vice President Jorge Familiar

Borrower: REPUBLIC OF ECUADOR	
Responsible Agency: Ministry of Agriculture, Livestock, Aquaculture and Fisheries	
Contact: Dennis Garcia	Title: Sub-secretary of Irrigation and Drainage
Telephone No.: 59323960100	Email: dgarciav@magap.gob.ec

Project Financing Data(in USD Million)					
[X]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[ ]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	128.60	Total Bank Financing:	80.00
Financing Gap:	0.00		

Financing Source	Amount
Borrower	20.00
International Bank for Reconstruction and Development	80.00
SPAIN, Govt. of	20.00
LOCAL BENEFICIARIES	8.60
Total	128.60

Expected Disbursements (in USD Million)

Fiscal Year	2016	2017	2018	2019	2020	2021				
Annual	5.00	15.00	20.00	20.00	15.00	5.00				
Cumulative	5.00	20.00	40.00	60.00	75.00	80.00				

Institutional Data

Practice Area (Lead)

Agriculture

Contributing Practice Areas

Water

Cross Cutting Topics

[X] Climate Change

[ ] Fragile, Conflict & Violence

[ ] Gender

[X] Jobs

[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Agriculture, fishing, and forestry	General agriculture, fishing and forestry sector	56	90	
Agriculture, fishing, and forestry	Irrigation and drainage	37	90	
Agriculture, fishing, and forestry	Agricultural extension and research	4		
Industry and trade	Agro-industry, marketing, and trade	3		
Total		100		

☐ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this Project.

Themes

Theme (Maximum 5 and total % must equal 100)

Major theme	Theme	%
Rural development	Rural services and infrastructure	50
Environment and natural resources management	Water resource management	20
Rural development	Rural markets	20
Environment and natural resources management	Climate change	10
Total		100

Proposed Development Objective(s)

The Project development objective is to enhance incomes of small and medium sized farm households by supporting more productive and climate-smart use for land and water.

Components

Component Name	**Cost (USD Millions)**
Component 1: Investments for climate-smart sub-projects	106.80
Component 2: Capacity building for institutional stakeholders and beneficiaries' organizations	6.30
Component 3: Project Management	15.50

Systematic Operations Risk- Rating Tool (SORT)

Risk Category	**Rating**
1. Political and Governance	Substantial
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Substantial
8. Stakeholders	Moderate
9. Other	
OVERALL	Substantial

Compliance

Policy

Does the Project depart from the CAS in content or in other significant respects?	Yes [ ] No [X]
Does the Project require any waivers of Bank policies?	Yes [ ] No [X]
Have these been approved by Bank management?	Yes [ ] No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ] No [X]
Explanation:	
Does the Project meet the Regional criteria for readiness for implementation?	Yes [X] No [ ]

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04	**X**	
Forests OP/BP 4.36		**X**
Pest Management OP 4.09	**X**	
Physical Cultural Resources OP/BP 4.11	**X**	
Indigenous Peoples OP/BP 4.10	**X**	
Involuntary Resettlement OP/BP 4.12	**X**	
Safety of Dams OP/BP 4.37		**X**
Projects on International Waterways OP/BP 7.50		**X**
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants

Name	Recurrent	Due Date	Frequency
Effectiveness of the Co-financing Agreement AECID/GoE (Article IV, Section 4.01)		01-Jun-2016	

Description of Covenant

The Co-financing Deadline for the effectiveness of the Co-financing Agreement for the US$ 20 million loan between the Spanish Cooperation (AECID) and the Republic of Ecuador is June 1, 2016

Name	Recurrent	Due Date	Frequency
Implementation of Project according the operation manual (Schedule 2, Section I.A.2.)	**X**		CONTINUOUS

Description of Covenant

The Borrower shall carry out the Project in accordance with a manual (the Operational Manual), satisfactory to the Bank, which shall include the rules, methods, guidelines, standard documents and procedures for the carrying out of the relevant Parts of the Project.

Name	Recurrent	Due Date	Frequency
Creation of Provincial Articulation Roundtables (Schedule 2, Section I.A.3.)	**X**		CONTINUOUS

Description of Covenant

Creation of Provincial Articulation Roundtables to screen requests of subprojects, evaluate eligibility and guarantee coordination between local stakeholders. The Provincial Articulation Roundtables should have participation of local stakeholders including the GADPs, NGOs, other MAGAP's Project and program representatives.

Name	Recurrent	Due Date	Frequency
Ministerial Accord for internal MAGAP's coordination (Sch. 2, Section I. I.A.4.)		07-June-2016	

Description of Covenant

The Borrower, through MAGAP shall issue a Ministerial Accord in a manner acceptable to the Bank, for the purposes of articulating and complementing actions among the different MAGAP’s Agricultural Programs and the Project, and maximizing the impacts and sustainability of the different activities derived from said Programs

Conditions

Source Of Fund	Name	Type
Borrower	Adoption of an Operation Manual approved by the Bank (Article V, Section 5.01. a.)	Effectiveness

Description of Condition

Adoption of an Operation Manual by the Government of Ecuador with No Objection from the Bank

Source Of Fund	Name	Type
Borrower	Creation of Central Unit of the Project Implementation Unit (Article V, Section 5.01. b.)	Effectiveness

Description of Condition

Creation of the Central Unit of the PIU in a manner satisfactory to the Bank

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Remi Charles Andre Trier	Team Leader (ADM Responsible)	Sr Water Resources Spec.		GFADR
Jose Yukio Rasmussen Kuroiwa	Procurement Specialist	Senior Procurement Specialist		GGODR
Ana Lucia Jimenez Nieto	Financial Management Specialist	Financial Management Specialist		GGODR
Abdelaziz Lagnaoui	Safeguards Specialist	Lead Environment Specialist		GENDR
Alexandra Christina Horst	Team Member	Jr Professional Officer		GFADR
Alonso Zarzar Casis	Safeguards Specialist	Sr Social Scientist		GSURR
Augusto Garcia	Team Member	Senior Operations Officer		GFADR
Gabriela Encalada Romero	Environmental Specialist	Environmental Specialist		GENDR
Jorge Trevino	Team Member	Sr Water Resources Spec.		GWADR
Maria Virginia Hormazabal	Team Member	Finance Officer		WFALN
Mariana Margarita Montiel	Counsel	Senior Counsel		LEGLE
Nicole Andrea Maywah	Safeguards Specialist	Sr Environmental Consultant		GENDR

Extended Team

Name	Title	Office Phone	Location
Dino Francescutti	Economist		
Luis Loyola	Irrigation Specialist	56-2-923-2241	Santiago

Locations					
Country	**First Administrative Division**	**Location**	**Planned**	**Actual**	**Comments**
Ecuador	Tungurahua	Provincia del Tungurahua	**X**		
Ecuador	Pichincha	Provincia de Pichincha	**X**		
Ecuador	Manabi	Provincia de Manabi	**X**		
Ecuador	Los Rios	Provincia de Los Rios	**X**		
Ecuador	Loja	Provincia de Loja	**X**		
Ecuador	Imbabura	Provincia de Imbabura	**X**		
Ecuador	Guayas	Provincia del Guayas	**X**		
Ecuador	Esmeraldas	Provincia de Esmeraldas	**X**		
Ecuador	El Oro	Provincia de El Oro	**X**		
Ecuador	Cotopaxi	Provincia de Cotopaxi	**X**		
Ecuador	Chimborazo	Provincia del Chimborazo	**X**		
Ecuador	Carchi	Provincia del Carchi	**X**		
Ecuador	Canar	Provincia del Canar	**X**		
Ecuador	Bolivar	Provincia de Bolivar	**X**		
Ecuador	Azuay	Provincia del Azuay	**X**		
Ecuador	Santo Domingo de los Tsachilas	Provincia de Santo Domingo de los Tsachilas	**X**		
Ecuador	Santa Elena	Provincia de Santa Elena	**X**		

I. STRATEGIC CONTEXT

A. Country Context

1. During the last decade, Ecuador has seen a period of relative political stability. The Government of Ecuador (GoE) has invested heavily in infrastructure and social sectors in an effort to stimulate growth, reduce inequality and promote inclusion for a total population of slightly more than 15.7 million inhabitants. The Ecuadorian external sector relies largely on the extraction and export of oil, and on the export of natural resource-based products and services. Some strategic economic sectors for Ecuador's development are agriculture, fishing, forestry and tourism. The agricultural sector accounted for 9.4 percent of the Gross Domestic Product (GDP) in 2013[1]. With more than 30 percent of its agricultural production destined for export on average for the period 2010-2013, Ecuador could benefit significantly from stimulating productivity through integrated rural development approaches.[2]

2. Growth combined with falling inequality has led to important gains in reducing poverty and promoting shared prosperity. Over the last decade (2003-2013), GDP per capita growth[3] in Ecuador was above regional average levels (2.7 percent vs. 2.5 percent), while progress in reducing inequality has exceeded regional trends. Income distribution was significantly improved, as expressed by the Gini coefficient, declining from 0.54 in December 2006 to 0.47 in December 2014. Likewise, between 2006 and December 2014, income poverty at the national poverty line fell from 37.6 percent to 22.5 percent, while extreme poverty fell from 16.9 percent to 7.7 percent.

3. Despite the significant reduction in poverty and growth of the middle class, more than half of the population in Ecuador remains poor or vulnerable to falling back into poverty, particularly in rural areas. In December 2014, 4.5 percent of the urban population lived in extreme poverty compared to the 14.3 percent for the rural population. The difference was less pronounced at the moderate poverty line, but even in this case the rural headcount was more than twice the urban headcount (35.3 percent versus 16.4 percent).

B. Sectoral and Institutional Context

4. Ecuador has 1.1 million agricultural households with land size between 1 ha and 20 ha, regarded as small and medium producers, who own about 1.6 million hectares (25 percent of total area at national level). This segment of farmers is crucial for many value chains such as rice (49 percent of national production), potatoes (64 percent), maize (76 percent) and onions (80 percent). Nevertheless, the development of this segment of farmers and its capacity to contribute to the diversification of productive matrix at the national level are limited by the small size of land, the lack of access to market, and by the poor access to efficient water management in agriculture. Out of the 338,000 ha irrigated by small and medium producers, 315,000 ha (93 percent) are still under traditional irrigation methods with very low water efficiency and limited water storage capacity. The access to modern techniques of irrigation by small and medium producers (7 percent of area equipped with sprinkler or drip) is notably below the average at national level (22 percent).

5. In 2012, the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP) prepared the National Plan for Irrigation and Drainage for 2012-2027. In March 2015, the

[1] Source: World Bank Data.
[2] Source: World Bank Development Indicators.
[3] GDP per capita growth (annual percent). Source: World Development Indicators, The World Bank

SENPLADES (National Secretariat of Planning and Development) confirmed the prioritization of the program called "Promotion of agricultural production through the implementation of systems of use and utilization of water resources for rural development and food sovereignty". The proposed Project will support this Program.

C. Higher Level Objectives to which the Project Contributes

6. The World Bank Group's Interim Strategy Note (ISN), Report No. 65114-EC for Ecuador discussed by the Executive Directors on April 9, 2013, identified agriculture and rural development as key priorities for the Government and the Bank to contribute to the country's goal for inclusive and sustainable growth. The proposed Project is fully consistent with the ISN for Ecuador, especially for the two following strategic areas: (i) Pillar I - Sustainable and Inclusive Growth and; (ii) Pillar II - Access to Social Protection and Quality Services for All, which focuses on investment Project financing.

7. The Project is aligned with the country's *Plan Nacional para el Buen Vivir 2013-2017*, established in 2013 by the SENPLADES ,where five out of twelve key objectives outline the importance of enhancing the productive water access in a sustainable manner as key intermediate priorities to ensure quality of life and social cohesion for its farmers and rural communities. The proposed Project is also fully aligned to MAGAP's institutional objectives which are: (i) Improving the lives of farmers and rural communities through the strategies: social inclusion of small and medium producers; links to national and international markets; and access to the benefits of the development of services and infrastructure and, (ii) Promoting the modernization of agriculture, aimed at the reactivation of production, depending on demand and with an emphasis on quality, differentiation and generation of value added oriented at sustainable development. It is expected that the proposed Project will contribute to the reduction of extreme poverty and the increase of shared prosperity by increasing agricultural revenues and resilience of Ecuador's family farming sector, promoting diversification and increase of agricultural production, and improving access to markets for smallholders and their organizations.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

8. The Project development objective is to enhance incomes of small and medium sized farm households by supporting more productive and climate-smart use for land and water.

B. Project Beneficiaries and areas

9. ***Project Beneficiaries.*** The Project beneficiaries groups are small and medium-sized family farmers, including indigenous communities. Small and Medium farmers are established by MAGAP according agro-climatological regions:

- Sierra: 0-5 ha. (small farmers) – 5 to 20 ha. (medium farmers)
- Costa: 0-20 ha. (small farmers) - 20 to 40 ha (medium farmers)

10. ***Project areas.*** While the Project is national in scope, the Sierra Central and the Coastal regions are the main target areas for investment subprojects where climatological conditions justify investments in water storage and irrigation to foster diversification and intensification of

agriculture. It is expected to benefit 14,150 families in a total area of 12,400ha[4] in 17 Provinces[5].

C. PDO Level Results Indicators

11. The PDO indicators will be: (i) the increase of Annual Net Income on benefited area and; (ii) the number of water users provided with new or improved irrigation and drainage services (Core indicator), disaggregated by men and women.

12. The intermediate Results Indicators will measure: (i) the area provided with irrigation and drainage services; (ii) the number of water users and technical staff trained; (iii) the Water Users Organizations created and strengthened; (vi) the community engagement in sub-project; (v) the adoption of improved technology; (vi) the agricultural intensification through land use intensity; (vii) the participation of women; (viii) the number of days for training activities and; (ix) the effective cooperation and coordination with other MAGAP's program and projects.

III. PROJECT DESCRIPTION

A. Project Components

13. The Project supports a framework program to strengthen sustainable modernization and intensification of agriculture systems with an emphasis on beneficiary and community participation. The Project will support: (i) demand-based investment productive subprojects in irrigated agriculture; (ii) small investments to enhance agricultural, soil and water management and environmental protection linked to the productive subprojects; (iii) capacity-building activities that strengthen national and local institutions and farmers' organizations; and, (vi) training and technical assistance to enhance productivity, increase value-added and improve market access.

14. Beneficiaries will receive an integrated and coordinated support[6] including: (i) Investments in irrigation modernization on and off-farm (Subcomponent 1.1); (ii) Small investments supporting sustainable management of natural resources (Subcomponent 1.2) and; (iii) Training and Technical assistance in: (i) Administration, Operation and Maintenance of irrigation schemes; (ii) Use of modern on-farm irrigation techniques and; (iii) agricultural productive aspects and access to market (Component 2).

15. In order to maximize the impacts and sustainability of activities, the Project will seek to coordinate its actions with existing government programs aimed at agricultural development such as the MAGAP's *Hombro a Hombro* Program (national extension program for family farming), the agricultural component of the *Plan Nacional Buen Vivir* 2013-2017, the *Proyecto de Innovación Tecnológica Participativa y Producción Agrícola (PITPPA)*; as well as programs developed by Provincial Governments in thematic support agricultural production and marketing (see Annex 6 for more details). To ensure this complementary and synchronized financing, the Project cycle implies that representatives of MAGAP's units[7], as well as representatives of their investment programs will participate in the Project's Provincial Articulation Roundtables and in

[4] The World Bank's share of the co-financing is expected to benefit 11,200 families in a total area of 9,800ha.

[5] Provinces of Sierra region: Carchi, Imbabura, Pichincha, Cotopaxi, Tungurahua, Chimborazo, Bolivar, Cañar, Azuay and Loja. Provinces of Costa region Esmeraldas, Manabí, Guayas, Santo Domingo de las Tsáchilas, Los Ríos, Santa Elena y El Oro.

[6] Even if originated from different project's components, other MAGAP's projects and programs or from the Latin America Investment Facility blended financing for Component 2 if approved by European Union (current request if Euro 8 million to support activities of Component 2), and implemented through different providers of services such as construction companies, individual consulting, NGOs or firms.

[7] Vice Ministry of Rural Development, Vice Ministry of Agriculture and Livestock, Sub-Secretariat of Commercialization, Coordination Unit for Innovation.

Evaluation and Coordination Committees. This specific institutional arrangement will be framed by an Intra-institutional Agreement or Ministerial Accord (*Acuerdo Ministerial*) to be executed during the first six months of implementation. The Ministerial Accord will require World Bank's no objection and be part of the Operations Manual.

The proposed Project (US$80 million in IBRD financing and US$20 million of co-financing from AECID) will be implemented over a period of five years and comprises three components: (1) Investments for climate-smart sub-projects; (2) Capacity building for institutional stakeholders and beneficiaries' organizations and; (3) Project Management.

Component 1: Investments for climate-smart sub-projects (US$106.8 million; US$ 67.7 million from World Bank loan)

Subcomponent 1.1: Productive Investments (US$ 100 million; US$ 63.4 million from WB Loan)

16. This sub-component will finance subprojects to be implemented by the Project Implementation Unit (PIU) and aligned with the Project objective and provincial priorities related to the following investments: (i) individual and/or collective small water storages (ponds); (ii) on-farm investments for modernization of irrigation techniques (drip, sprinkler or modern gravity techniques) and; (iii) complementary works aiming at improving off-farm irrigation and drainage networks.

17. The proposed sub-Project cycle is divided into six main phases: (i) Identification; (ii) Pre-feasibility; (iii) Feasibility / Pre-investment; (iv) Procurement process and implementation of Investment; (v) Technical assistance and support activities; (vi) Closing and transfer of the investments to the beneficiaries. Detailed description of sub-project cycle including the eligibility criteria is shown in Annex 2.

Subcomponent 1.2: Improvement of Agricultural Practices, Water and Soil Management (US$ 6.8 million; US$ 4.3 million from World Bank Loan)

18. This sub-component will finance small investments linked to the subprojects of subcomponent 1.1, and will support the implementation of climate smart agriculture activities. The sub-component will adopt an integrated and participatory approach intended to encourage rural populations to manage their land and natural resources in a more sustainable manner. This would also support building and strengthening the capacity of beneficiaries to adopt new farming techniques aiming at: (i) increasing productivity and yields, (ii) improving the resilience of their crops to the impact of climate change and (iii) creating more sustainable plant, soil and water management. Thus, this sub-component would contribute to: (i) promoting agricultural best practices, particularly integrated crop management, conservation agriculture, intercropping, improved seeds and fertilizer management practices; (ii) increase productivity and sustainability of agricultural production based on agro-ecological and agroforestry technologies; and (iii) strengthen the management of sustainable agriculture to improve the environment and living conditions and reinforcing local and cultural identity. Examples of investment sub-projects for sub-component 1.2 are listed in Annex 2.

19. The design of the activities of this sub-component will be defined according to the demands generated by the subprojects proposed under subcomponent 1.1. The identification of investments under subcomponents 1.1 and 1.2 will be done together in the feasibility study through a participatory process and participation of an environmental specialist to ensure adequate integration of environmental aspects.

Component 2: Capacity building for institutional stakeholders and beneficiaries' organizations (US$6.3 million; US$ 5.6 million from World Bank loan)

20. This component will provide technical assistance and training services needed in the short term (up to 12 months) to help optimize the productive, environmentally sustainable, and commercial use of the off- and on-farm irrigation systems and water ponds that will be improved or built under Component 1. Additional support will be provided to strengthen organizational and business capacities of producer groups, communities and small producer organizations as well as broad activities fostering smallholder linkages to markets in the mid-term. These activities will be focused on improving and supporting the outcomes related with the subproject investments.

21. The component will support the Water Users' Organizations, Farmers' Organizations, and producers by providing technical assistance and training, amongst others, on: (i) management and optimization of off- and on-farm irrigation systems and water ponds, (ii) adoption of good agricultural practices to improve production and productivity, value-addition and post-harvest management, (iii) improvement of market linkages and access of small-size producers to agricultural value chains, organizational development and legal advice, and (iv) environmental management at community or farm levels (connected to investments under sub-component 1.2). Also, this component will help improve the local supply of technical services available to producers by building capacity amongst key institutional stakeholders (i.e. MAGAP central and territorial offices, provincial and municipal GADPs, and local providers of agricultural technical services). Additionally and when necessary, this component will prepare general analytical information (i.e. diagnostics of relevant productive systems, catalogs of agricultural technologies and climate-smart innovations, analysis and mapping of agricultural value chains, and characterization of commercial opportunities to improve access to markets for beneficiary groups).

22. Identification and design of the required technical support activities will be part of the feasibility studies to be carried out for subproject investments under component 1. The studies will include a specific **Training and Technical Assistance Plan** for each subproject and group or producers, to be financed by the Project. In addition to this, the feasibility studies will prepare a broader **Agricultural Development Plan** to help identify, design, and materialize mid-term productive and business development activities and investments in the beneficiaries' productive and commercial systems; this Plan would be financed by the existing MAGAP programs (i.e. *Estrategia Hombro a Hombro, Buen Vivir* Program, and *Programa Innovacion* - PITPPA) or by GADPs. See details about this component in Annex 2. The institutional arrangement to ensure complementary investments by MAGAP programs is described in Annex 3.

Component 3: Project Management (USD 15.5 million; US$ 6.7 million from World Bank)

23. This component will support: (i) the functioning of the Central Unit of the Project Implementation Unit (PIU) to be installed within the Under-Secretariat of Irrigation and Drainage in the MAGAP in Quito and; (ii) eligible costs and staffing related to the Project on 7 decentralized offices of MAGAP (*Zonales*)[8]. The component will also finance Monitoring and Evaluation, impact evaluations, progress reports, and audits.

24. The Central Unit of the Project Implementation Unit (PIU) within the MAGAP's Headquarters in Quito will be responsible for the overall administration of the Project. This Central

[8] Zonal 1: Imbarra / Zonal 2: Tena / Zonal 3: Riobamba / Zonal 4: Porto Viejo / Zonal 5:Guayaquil/ Zonal 6: Macas/ Zonal 7: Machala.

unit will be responsible for all the procurement activities during Year 1 and will transfer progressively responsibilities to the 7 *Zonales* upon creation of local capacities, as described in Annex 2 and Operation Manual.

B. Project Financing

25. The total cost of the Project is US$128.6 million, financed by a US$80.0 million loan from IBRD, a US$20.0 million loan from Spanish Agency for International Development Cooperation (*Agencia Española de Cooperación Internacional para el Desarrollo;* AECID), MAGAP's counterpart funding of US$20.0 million, and US$8.6 million in beneficiary contributions.

	Components	IBRD (US$M)	AECID (US$M)	Co-financing (US$M)		Total (US$M)	IBRD Financing (percent)
				MAGAP	Beneficiaries		
1	**Investments for climate-smart sub-projects**	**67.7**	**18.2**	**12.3**	**8.6**	**106.8**	**63%**
1.1	*Productive investments*	*63.4*	*17.0*	*11.6*	*8.0*	*100*	*63%*
1.2	*Improvement of Agricultural, Water and Soil management Practices*	*4.3*	*1.2*	*0.7*	*0.6*	*6.8*	*63%*
2	**Capacity building for institutional stakeholders and beneficiaries' organizations**	**5.6**		**0.7**		**6.3**	**89%**
3	**Project Management**	**6.7**	**1.8**	**7.0**		**15.5**	**43%**
	TOTAL	**80.0**	**20.0**	**20.0**	**8.6**	**128.6**	**62%**

26. AECID will provide a total co-financing of US$ 20 million to be split between components 1 and 3. A co-financing agreement will be signed with AECID in which the latter will agree to pay the Bank a fee for the supervision of their portion of the Project, using the Bank's procurement and safeguard rules as well as the Bank's financial management principles and procedures. The WB and AECID agreed to have periodical supervision meetings to review the progress of implementation and discuss the planning of investments, including the breakdown of subprojects by financiers.

27. The AECID will only finance sub-projects on MAGAP's Zone 1 (Provinces of Esmeraldas, Carchi, Imbabura and Sucumbios) and Zone 3 (Provinces of Pastaza, Cotopaxi, Tungurahua and Chimborazo). Sub-projects under Component 1 will be under parallel financing from World Bank or AECID (i.e., a sub-project will be either financed by World Bank or AECID). For Component 3, the AECID will also finance the operational costs (including technical staffing) of the Project for the two *Zonales* Offices (Zone 1 and 3). For Component 3, the World Bank will finance operational costs (including technical staffing) of the Project for the 5 other *Zonales* Offices.

28. The contribution from beneficiaries will be 10 percent or more of the investments costs realized by the project under Component 1, and will be done in-kind through provision of manpower and local materials during subprojects implementation.

29. The MAGAP's co-financing will consist of: (i) the Value Added Tax (IVA) for the three components; (ii) For Component 1, the initial promotion of Project and call for proposals; and (iii) For Component 3, the costs of administrative staff within the Central Unit of the PIU and in the

7 decentralized offices (*Zonales).*

C. Lessons Learned and Reflected in the Project Design

30. The proposed Project was built on the successful model of the Bank supported Development Investment Program (Proyecto de Inversiones de Desarrollo Productivo; PIDD) implemented in Chimborazo Province (P094784) and closed in June 2014. The PIDD financed subprojects of modernization works for 55 small and medium scale collective irrigation systems, benefiting 4,685 ha and 7,900 families. The PIDD generated a substantial body of lessons including: (i) the necessity of combining physical investments with capacity building; (ii) the need to frontload technical assistance and training for the institutional stakeholders; and (iii) the need to build beneficiary ownership by following a demand-driven and participatory approach in which the Water Users' Associations (WUA) and farmers' groups participate in subproject design, financing, execution and supervision and are fully responsible for Operation & Maintenance. The Project cycle developed by the PIDD, especially the effective participation of beneficiaries from the design to the construction, has been adopted by the Provincial Government of Chimborazo as a public policy to develop any investment intervention in the future.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

31. **Proposed implementing agency**. The Project will be implemented by the Under-Secretariat of Irrigation and Drainage of MAGAP. MAGAP will create a dedicated Project Implementation Unit (PIU) in Quito and reinforce the team of the 7 *Zonales*. By legal ministerial decision[9], the PIU shall acquire the status of a Decentralized Operational Entity (*Entidad Operativa Desconcentrada* or EOD*)*. The MAGAP will hire for the Central Unit in Quito and the 7 *Zonales*, under local and international financing, a team of fully dedicated professionals to ensure the proper implementation of Project activities and be responsible for technical and financial management, procurement, environmental and social safeguards, and overall monitoring and evaluation activities (M&E). The technical experts (hydraulic engineers and agronomists) as well as the experts for environmental and social safeguards will be hired as consultants and their costs will be funded by the loans from World Bank and AECID. The Seven Zonal Offices will be reinforced according the needs and the pace of activities implementation. The average Project staffing at Zonal level will be composed of: a coordinator, one or two hydraulic engineers and agronomist, a social expert, an environmental expert, a specialist in procurement, another in financial and administrative management. The staff in the PIU Zonal Offices will be deployed progressively in accordance with the work load and quantity of subprojects to be developed. The technical staff (financed by WB and AECID) will be hired: (i) at half-part time if the demand for subproject is ranging from 1 to 3 per *Zonal* and; (ii) at full-time when the demand will be exceeding 3 subprojects.

32. **Participation of MAGAP Zonal Offices**. Under supervision of the Central unit of the PIU in Quito and after an intense process of fiduciary capacity building, the seven MAGAP offices (*Zonales*) may be responsible, after completion of Year 1, of the procurement processes for individual and specific consultancies, works and goods below a ceiling to be determined in the

[9] Acuerdo Ministerial.

Operation Manual[10] and when the Central unit of the PIU will determine that there are comparative advantages to procure locally (e.g. language-specific consultancy).

33. **Participation of GADPs and other stakeholders.** The MAGAP will establish, at provincial or lower level, formal Articulation Roundtables[11] with main institutional key players in rural development (GADPs, Non-Governmental Organizations - NGOs, other MAGAP's projects and programs, etc.). Minutes of meetings will record all the comments, agreements and commitments regarding the profiles. The final technical studies (including economic, environmental and social dimensions) will need to be validated by the beneficiaries' organization and the Articulation Roundtables before the contracting and procurement of works.

B. Results Monitoring and Evaluation

34. Component 3 will support the activities of Monitoring & Evaluation of the Project. An M&E specialist will be hired on a full-time basis during the first 3 months of implementation and will be part of the PIU team. S/he will develop a specific M&E system to support the implementation of Project. This specialist will work in close coordination with the staff in charge of M&E within the headquarters of MAGAP in Quito for the Ministry in general and/or for other projects (*Hombro a Hombro, Buen Vivir*, etc.). The M&E specialist will collect data to measure Project results and outcomes. Under Component 3, the PIU will be responsible for hiring/commissioning and supervising the following tasks: (a) Project baseline (to be completed by May, 31 2016) using the results of the first 30 feasibility studies to be prepared for the broader SENPLADES program); (b) Technical and other studies needed to understand Project performance; (c) Mid-Term Review; (d) Final impact evaluation and (e) Preparation of Project reports.

35. A Beneficiary Monitoring System (BMS) will be developed by MAGAP as a simple, effective and participatory instrument to monitor Project progress with all relevant stakeholders (beneficiaries, technicians of co-implementing agencies, and others). Two intermediate-level Result Indicators reflects citizen engagement (i. e., Sub-projects with post-Project community engagement or Operation and Maintenance - O&M arrangements, in number and in percentage).

C. Sustainability

36. The Project will incorporate several mechanisms to achieve sustainable impacts, such as:

a. The **participation and consultation of beneficiaries** throughout the identification, design, preparation, implementation, and supervision of subproject activities will enhance their ownership. This coupled with the beneficiaries' financial participation to the investments will increase the likelihood of sustainable impacts. Through training, the Component 2 will aim at setting up a sustainable cost recovery system for irrigation and drainage services that will take into account the local practices such as community labor (*mingas*) in the Central Sierra Provinces. This Component will also foster complementary support from MAGAP to beneficiaries, including organizational and business development activities.

b. The **participation of local stakeholders and national / provincial programs** will also contribute to leverage the continuous support to beneficiaries' organizations after completion

[10] US$ 100,000 at the time of PAD's preparation.
[11] *Mesa de Articulación Provincial.*

of subprojects and to ensure sustainable impacts. This will also contribute to promote private investments alongside public investments to foster sustainable impacts.

c. **Eligibility criteria**[12] applied to the selection of subprojects across provincial and subproject levels will promote and favor comprehensive, high quality subproject designs. The inclusion of integrated Technical Assistance (on administration, operation, maintenance of irrigation investments, on agricultural sustainable production and commercialization) and strict targeting mechanisms will further promote subproject sustainability.

d. The Project will implement rigorous **screening procedures that reduce environmental risk** and will promote in Sub-component 1.2 complementary activities that will improve agricultural and natural resources management practices and foster environmental sustainability.

e. The **M&E Unit in Quito will also create and manage a Project-level grievance redress mechanisms (GRMs)** to raise and address Project-related grievances during all the steps of subproject cycle. The GRMs will be implemented by the MAGAP Zonal Offices to ensure that these are at reach for the local people.

V. KEY RISKS

A. Overall Rating and Explanation of Key Risks

37. The overall risk rating is substantial. The decentralized nature of the Project, the limited participation and ownership by the Decentralized Provincial Autonomous Governments, the lack of experience with World Bank's fiduciary procedures and insecure land tenure ownership are seen as substantial risks for the implementation of Project.

38. One of the key risks is linked to the **decentralized nature** of the Project, which will finance an important number of subprojects in several provinces with different levels of capacity. This risk will be mitigated by an initial period when responsibility will be retained with the Central Unit of the PIU in Quito. After a period of capacity building provided by the Project, there will be a progressive and partial transfer of responsibilities of implementation to the decentralized representation of MAGAP (*oficinas zonales*). The Central Unit of the PIU in Quito will remain in charge of procurement and financial management of all works and consultancy services above the established ceiling, but will hand over some fiduciary and technical activities to the decentralized offices of MAGAP such as: (i) procurement and financial management of activities that have comparative advantages to be managed at zonal level; (ii) some technical functions such as support to the initial stages of identification of sub-projects, and supervision of works. Other risks may be the rotation of staff within MAGAP, and difficulties to hiring staff with required profiles, particularly in the regional/zonal offices.

39. An important risk for the Project is related to the **limited participation and ownership by**

[12] See detailed Sub-project cycle in Annex 2 with criteria that apply at different stages of the cycle. At identification stage, the eligibility criteria are: (i) existence of formal demand of the corresponding Farmers' Organizations; (ii) Accreditation to be a recognized organization or disposition to obtain accreditation from MAGAP as a formal producer organization; (iii) existence of Legal water right or feasibility of water use granted by SENAGUA and (iv) Existence of land titles or other evidences of secure land tenure accepted by the project as per Annex 8. After completion of feasibility study, additional criteria are added such as, among others: (i) existence of beneficiary participation/co-financing; (ii) compliance of investment under ceiling; (iii) financial viability and sustainability; (iv) economic return; and (v) compliance with social and environmental safeguards (see Annex 2).

the Decentralized Provincial Autonomous Governments of the investments realized under the Project. To minimize this risk, Provincial Articulation Roundtables will be created as described in Section IV A to ensure local engagement through the identification of sub-projects.

40. A key consideration in making investments in irrigation is the extent to which intended beneficiaries have **secure rights to the land they farm**. International experience confirms that clear and recognized land rights are crucial for incentivizing on-farm improvements and responsible land stewardship. Where land rights are perceived to be insecure, the potential for conflict increases, farmers are less committed to the maintenance of infrastructure, and support from outside agencies such as banks or governments is less available or considered risky. A significant percentage of Ecuadorian farmers either possess titles that are out-of-date or incorrect, or hold undocumented possession of so-called *tierras baldías*[13] (see Annex 8): 12% of the total are *tierras baldías* for adjudication and further titling, 30% have legal land titles; and 58% account for rural *land owners* that do not hold an updated title.

41. While national efforts are underway to extend the reach and improve the functioning of land administration[14], these are long-term endeavors. In the meantime the practice of MAGAP has been to depend on a variety of **alternative instruments and approaches**[15] which have generally proven sufficient to address the potential tenure-related risks to irrigation investment. These experiences have provided important lessons which form the basis of the Project's proposed approach to land rights issues, which is set forth in Section E of Annex 8.

42. From the environmental perspective, the risks in these kinds of activities are often associated with the construction and/or rehabilitation of irrigation infrastructure and with the intensification of agriculture. However, this Project will focus on on-farm investments and rehabilitation of small irrigation infrastructure; no new large-scale water infrastructure will be built, which will minimize environmental risks. Intensification of productive activities will most likely increase the use of agricultural inputs (fertilizers and pesticides) eventually that will need to be mitigated to reduce their potential negative impacts. As specific sites and exact activities will not be known during the Project preparation, an environmental and social management framework (ESMF) has been prepared to screen, assess, and mitigate environmental impacts related to proposed subprojects that may involve investments in productive activities and construction or rehabilitation of small irrigation infrastructure.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

43. The major impact of the Project would be an increase of beneficiaries' annual agricultural production value and of agricultural revenues generated by investments on irrigation infrastructure

[13] T*ierras baldías* are lands that comprise the following situations: (i) All undeveloped land that is part of the National Territory with no other owner; (ii) lands that have reverted to the State for any legal cause; (iii) lands that remain or have remained uncultivated for more than ten consecutive years; and (iv) those lands awarded by the State but for which property titles have not be issued.

[14] The 2010 Constitutional reforms (Art 57; Art. 225, Art 226) supported land titling and free land adjudication for ancestral land. Recent legal reforms such as Decree 373 (2010), the Technical Protocol for rural land titling (2013) and Land Civil Registry reforms (2013) aimed at better supporting and enabling land titling. These reforms have allowed cadastral system innovation through improved technology, and strengthened incentives for land titling at the national level.

[15] The alternative instruments are varying according the type of sub-projects and the stage of the subproject cycle (cf. Annex 8) and comprises: (i) Accreditation by official registry (*Padrones*); (ii) Technical Report from MAGAP; (iii) Adjudication Certificate by Land Sub-Secretariat; (iv) Certificate of lawful inheritance or (v) Agreement among the interested parties.

rehabilitation, on-farm irrigation technology improvement; water storage subprojects and the related activities of training and technical assistance. The MAGAP conducted a feasibility study for the National Irrigation Program for small and medium-scale family farming. A revised version of the economic analysis of the National Program results in an Economic Internal Rate of Return (EIRR) of 20 percent. The most important representative crops are: cocoa, maize, rice, potatoes, pastures, coffee, banana and vegetables.

44. The Implementation Completion Report (ICR) for the Chimborazo Productive Development Investment Project (PIDD) is under review. Based on preliminary figures, the average subproject EIRR was 29 percent. Irrigation investments funded by PIDD were essentially off-farm community-collective irrigation infrastructure improvements. Annual agricultural production value increased by 33 percent (from US$ 880 to US$1,177 per average beneficiary family) within the 1-2 years of operation.

45. To provide complementary field evidence, a review was conducted of ex-ante feasibility assessments of subprojects between November 2014 and January 2015, with sizable irrigation technology components, recently funded by other development programs of the MAGAP. Based on this review, several subprojects were selected from various provinces, namely: Azuay, Chimborazo, Carchi, Loja, Los Rios, Manabí and Santa Elena. Around 50 percent of their total investment costs consist of improved on-farm irrigation technology – major investment category foreseen for the Project.

46. **Financial Analysis.** Based on estimates for the fifth year of sub-project operation, the average annual production value increases by US$ 2,050/Family or US$ 3,110/Ha (160 percent of without project situation). In turn, the average annual financial net income increases by US$ 930/Family or US$ 1,420/Ha (2.8 fold increase). The Financial Internal Rate of Return (FIRR) of the most promising subprojects was around 26 percent. The Financial Net Present Value (FNPV) for a total investment on subprojects of US$ 100.5 million would be US$ 68 million. If other component costs are accounted for, without considering their potential benefits, the FIRR under the most promising scenario is 19 percent. The FNPV for a total Project investment of US$ 129.1 million, including AECID and local co-financing would be US$ 43 million.

47. **Economic Analysis.** Considering economic prices (without taxes), based on estimates for the fifth year of operation, the average annual economic net income increases by US$ 1,270/Family or US$ 1,930/Ha (2.5 fold increase). The Economic Internal Rate of Return (EIRR) of the most promising subprojects was around 41 percent. Finally, if other component costs are accounted for without considering other potential benefits, the average EIRR under the more promising scenario is 32 percent. The Economic Net Present Value (ENPV) for a total investment of US$ 129.1 million (US$ 116 million without taxes) would be US$ 118 million.

48. **Trade Balance.** Based on estimates of *Hombro a Hombro* Strategy on share of imported agricultural goods, and FAO[16] statistics on export share of products considered in analyzed subprojects, a trade balance analysis was performed. The net balance of exports minus imports, and thus of foreign exchange net inflows, is measured by the aggregate NPV of the most promising scenario. Without other project costs, such a NPV is around US$ 36 million. Considering other project costs, the NPV of foreign exchange inflows is US$ 14 million.

[16] Food and Agriculture Organization of the United Nations

B. Technical

49. **Greenhouse Gas Accounting Assessment.** A GHG accounting analysis for this Project has been prepared with the use of the Ex-Ante Carbon-balance Tool (EX-ACT). As a result of the GHG accounting analysis, we find that the Project constitutes a carbon sink of 3,064,648 tCO2-eq. Most of the carbon sequestered is due to an increase in perennial crop cultivation from non-forest land use changes (2,077,653 tCO2-eq). The improved agronomic practices and water management of annual crop cultivation also adds to the carbon sink with 30,294 tCO2-eq. Livestock and inputs are the main carbon sources of the Project; however, compared to the emissions in the business-as-usual scenario the total emissions from livestock and input activities are lower, leading to a negative carbon balance of 1,295 tCO2-eq and 101,902 tCO2-eq, respectively. The details of the GHG analysis are described in Annex 7.

50. **Technical Design.** The proposed Project aims at supporting MAGAP's initiative to strengthen farmers still using traditional irrigation methods with very low water efficiency and limited water storage capacity in their effort for intensification and modernization of agriculture in line with international standards. The Project will therefore finance two types of subprojects:

- Type 1: Modernization of irrigation on-farm on existing collectively managed irrigation scheme (public and/or associative). This type of subproject is designed to cover interventions within farmers' plots by modernizing their irrigation system and, when necessary, including interventions in the collective system, with an average of 0.75ha per beneficiary.
- Type 2: Individual and/or collective small water reservoir and on-farm system outside of existing irrigation schemes. This type will basically consist in the construction of individual or collective small water storage infrastructure (ponds of an average of 1,200 cubic meters) that will capture water from rain or other sources without affecting third parties or the quantity or quality of water flowing through public / private canals or natural networks. These reservoirs will allow the introduction of modern irrigation techniques into farmers', with an average of 1.5ha of land equipped with modern irrigation techniques per beneficiary.

C. Financial Management

51. As part of the Project preparation, a Financial Management Assessment (FMA) was carried out to evaluate adequacy of financial management arrangements planned by MAGAP for the implementation of the Project. The Project will be implemented by the *Subsecretaría de Riego y Drenaje*, under the *Vice Ministerio de Desarrollo Rural* of the MAGAP, through establishment of an *EOD* and with participation of MAGAP's regional offices (at Zone level). Within those arrangements, MAGAP will hire fully dedicated Finance professionals under the central unit of the PIU and at regional level, responsible for financial management tasks.

52. Overall, MAGAP has gained experience implementing projects financed by IADB and local funding through EODs, yet MAGAP has no recent experience implementing World Bank financed projects and will require time to familiarize with some processes. Considering Project design encompasses several subprojects implemented at central and regional level (*Zonales*) of MAGAP, close coordination and standardized process and procedures have been designed not only for an adequate use of funds, but also to assure timely and reliable financial information on the Project. Different financiers (WB, AECID, and local counterpart) in the Project required to standardize and harmonize financial management arrangements. On the basis of the above mentioned, proposed financial management arrangements are considered acceptable to the Bank.

D. Procurement

53. Procurement activities will be carried out by the MAPAG through the Central Unit of the PIU in Quito and the decentralized "zonal" offices (ZO). Procurement risks are related to the upcoming creation of the central PIU and the ZO. The technical and fiduciary teams do not have experience with Bank procurement procedures and contract monitoring. Additional potential risks include the poor quality of works and delays in completion of works due to: (i) contractors winning at significantly lower prices than engineer's estimates; (ii) timely supply of materials for irrigation systems; and (iii) inadequate management of large contracts due to lack of proper experience.

54. As part of Project preparation, an assessment of the procurement capacity of the implementing agency was carried out by the Bank in November 2014, January and February, March 2015 and it was agreed to implement the Central unit of the PIU and the ZO with adequate: (i) organizational structure, (ii) facilities and support capacity, (iii) qualifications and experience of the staff that will work in procurement, (iv) record-keeping and filing systems, (v) procurement planning and monitoring/control systems used, and (vi) capacity to meet the Bank's procurement contract reporting requirements.

55. For the procurement activities, the PIU will be staffed with a dedicated procurement specialist, and a dedicated procurement specialist at each zonal office[17] supported by the MAPAG PIU technical and administrative staff. The suggested management measures that were agreed upon are: (i) a Project Operational Manual including, inter alia, procurement and contracting procedures, which will be adopted as a condition of negotiation of the Loan Agreement; (ii) the Loan Agreement will include additional provisions related to Project Implementation under the Procurement point of view and; (iii) a systematic training program by the Bank on procurement for the existing and new lending operations in Ecuador, also close monitoring by the IBRD[18], particularly, during the first two years of Project implementation (cf Annex 3).

E. Social (including Safeguards)

56. The Project will benefit a large number of small and medium size farmers in the highlands and coast of Ecuador. A significant number of those families benefited by the Project are expected to be from indigenous communities in the highlands as well as from afro-Ecuadorian communities in the coast. For this reason the Indigenous Peoples safeguard policy (OP/BP 4.10) has been triggered. Because the Project is demand driven, it is not possible to determine before appraisal neither the precise locations for Project intervention nor the number of beneficiaries coming from indigenous or afro-Ecuadorian communities.

57. Land use for Project implementation is expected to be mostly in the family farm for the benefit of the small and medium size producer; however there is a likelihood that in some instances land might be used involuntarily for laying out pipes or other minor infrastructure required for the irrigation systems. Thus there is a chance that rights of way, acquisition of small areas of land may be needed; no physical or economic displacement is expected. For these reasons OP/BP 4.12 Involuntary Resettlement policy has been triggered.

58. The main local organizations that will be actively involved in Project implementation, i. e. in the early stages of subprojects cycles, are the *Juntas de Regantes*, these are legally recognized and are nationally grouped in the *Juntas Administradoras de Agua Potable y Riego* (JAAPRE).

[17] Seven (7) zonal offices.
[18] At least quarterly missions in the first two years.

The ESMF and IPPF were consulted on a national event held on March 11, 2015 with participation of representative of indigenous organizations. The feedbacks received during this consultation process were included in project design.

59. In order to improve Project implementation and to comply with the Bank's safeguard policies MAGAP has prepared an Environmental and Social Management Framework (ESMF), an Indigenous Peoples Planning Framework (IPPF) and a Resettlement Policy Framework (RPF). The IPPF will guide Project activities whenever indigenous families and afro-Ecuadorians are involved and will help in organizing an adequate communication strategy to ensure Indigenous Peoples participation in Project benefits. During the first phase of Project implementation, the social specialist from the Central unit of the PIU, with support from the task team social specialist, will design a methodology for the implementation of OP 4.10 in regard to the preparation of Indigenous Peoples Plans (IPPs). Because this Project will finance a large number of sub projects, it is virtually impossible to prepare IPPs for each sub Project. Instead, the preparation of IPPs will be done through grouping together sub projects by region and ethnicity. It is worth mentioning that the IPPs will do not add more than what the Project is already financing because the Project has no adverse impacts, but will ensure that the provisions of the policy are fully included and documented. The RPF will provide guidance in regard to rights of way, land acquisition and compensations in case Project activities affect crops due to minor civil works. The Environmental and Social Management Framework (ESMF) as well as the IPPF include a gender approach to reinforce women's role and enhance women's participation in Project activities, and to ensure women's participation in the decision making process. In order to promote Project inclusion of women, indigenous families and afro-Ecuadorians, it has been agreed that the Project will hire local social promoters (with knowledge of local languages and culture), as it was done in the Chimborazo (PIDD) Project with great success, to facilitate the participation of those groups.

60. The Project is not expected to have adverse social impacts; it would rather improve family livelihoods and income generation while at the same time make a more efficient use of natural resources, in particular water resources. The most important social risk the Project faces is the exclusion of the *posesionarios*, farmers who have not formalized their land tenure (cf. before, section on risks assessment).

61. The IPPF was consulted on a national event held on March 11, 2015 with participation of representative of indigenous organizations. The feedbacks received during this consultation process were included in project design. The Resettlement Policy Framework and Indigenous Peoples' Planning Framework were first disclosed to the public both in-country on MAGAP's website (at www.agricultura.gob.ec) and at the World Bank's external website on May 9, 2015 and May 13, 2015 respectively and revised on May 31, 2015.

F. Environment (including Safeguards)

62. The proposed Project is expected to generate overall positive environmental and social impacts given its objective to increase agricultural revenues and resilience of Ecuador's family farming sector by promoting on farm investments geared toward a more efficient use of natural resources. The focus will be on efficient water use, increased adaptation to climate change, improved productivity and market access, overall contributing to an increased competitiveness and sustainability of agricultural production systems. The Project may involve investments in productive activities and construction or rehabilitation of small irrigation infrastructure but these are expected to have limited environmental impacts mostly during construction.

63. However, since subproject sites are not yet known, the Project may include subprojects in the proximity of important critical natural habitats within high priority ecosystems in Ecuador (*páramos*) and human activity in the buffer zones induced by the Project may indirectly impact natural habitats. So, the Project activities will promote environmentally sound agricultural practices, which may include innovative mechanisms to protect environmentally sensitive habitats.

64. The Project's Environmental Assessment category is B. The Project will not finance any Category A activities or subprojects including those that could potentially cause significant conversion or degradation of natural habitats. Also, the intensification of agriculture through irrigation and potential change in production systems may involve pest management and the use of agro-chemicals in subproject activities. No significant or irreversible impacts are foreseen as a result of Project activities.

65. The environmental safeguard policies on Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Pest Management (OP 4.09), and Physical Cultural Resources (OP/BP 4.11) have been triggered. As specific sites and exact activities are not known at this stage, an Environmental and Social Management Framework (ESMF) has been prepared to screen, assess, and mitigate environmental impacts related to proposed subprojects that may involve investments in productive activities and construction or rehabilitation of small irrigation infrastructure. The ESMF also describes the Project's complaints mechanism and contains monitoring provisions. The ESMF describes how pesticide management will be handled in the project and includes guidance on development of Pest Management Plans, training on proper handling and storage of pesticides and other related measures.

66. The project design and the ESMF was consulted on a national event held on March 11, 2015. No feedbacks were provided on the ESMF. The ESMF was first disclosed to the public both in-country on MAGAP's website (at www.agricultura.gob.ec) and at the World Bank's external website on March 23, then revised on May 21, 2015 and May 31, 2015.

G. World Bank Grievance Redress

67. 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.

Annex 1: Results Framework and Monitoring

Country: Ecuador

Project Name: Ecuador - Sustainable Family Farming Modernization Project (P151963)

Results Framework

Project Development Objectives

PDO Statement

The Project development objective is to enhance incomes of small and medium sized farm households by supporting more productive and climate-smart use for land and water.

These results are at	Project Level

Project Development Objective Indicators

Indicator Name	Baseline	Cumulative Target Values					
		YR1	YR2	YR3	YR4	YR5	End Target
Increase of Annual Net Income on area benefited by project (Percentage)		0	0	15	35	60	60
Water users provided with new/improved irrigation and drainage services (number) (Number) - (Core)	0	0	3,500	7,000	10,500	14,150	14,150
Water users provided with irrigation and drainage services - female (number) (Number - Sub-Type: Breakdown) - (Core)	0	0	700	1,400	2,100	2,830	2,830

Intermediate Results Indicators

Indicator Name	Baseline	Cumulative Target Values					
		YR1	YR2	YR3	YR4	YR5	End Target
Area provided with irrigation and drainage services (ha) (Hectare(Ha)) - (Core)	0	0	3,100	6,200	9,300	12,400	12,400
Area provided with irrigation and drainage services - New (ha) (Hectare(Ha) - Sub-Type: Breakdown) - (Core)	0	0	930	1,860	2,790	3,720	3,720
Area provided with irrigation and drainage services - Improved (ha) (Hectare(Ha) - Sub-Type: Breakdown) - (Core)	0	0	2,170	4,340	6,510	8,680	8,680
Operational water user associations created and/or strengthened (number) (Number) - (Core)	0	0	22	44	66	88	88
Clients who have adopted an improved agricultural technology promoted by the project (Number) - (Core)	0	0	1,050	2,100	3,150	4,245	4,245
Clients who adopted an improved agr. technology promoted by project – female (Number - Sub-Type: Breakdown) - (Core)	0	0	210	420	630	850	850
Increase of Land use intensity (Percentage)	0	0	0	5	10	15	15
Sub-projects with post-project community engagement or O&M arrangements (percent percent) (Percentage) - (Core)	0	0	0	70	80	90	90
Sub-projects that are expected to have a mechanism for post-completion operation (Number - Sub-Type: Supplemental) - (Core)	0	0	0	15	35	59	59

Indicator Name	Baseline	Cumulative Target Values					
		YR1	YR2	YR3	YR4	YR5	End Target
Client days of training provided (number) (Number) - (Core)	0	0	0	21,000	42,000	63,000	63,000
Client days of training provided - Female (number) (Number - Sub-Type: Breakdown) - (Core)	0	0	0	4,200	8,400	12,600	12,600
Number of training days provided to MAGAP's or GADP's staff (Days)	0	0	960	1,920	1,920	1,920	1,920
Number of beneficiaries' organizations that received support from another MAGAP's or GADP's Project or Program (Number)	0	0	0	22	43	74	74

Indicator Description

Project Development Objective Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Increase of Annual Net Income on area benefited by project	Calculated on the area benefited by the project, only for agricultural activities within the household, and in real terms. Incomes are expected to start increasing one year after the completion of investment phase (after the period of training and technical assistance under Component 2)	Yearly	Baseline: The annual net income before Project was estimated at USD500/ha during the ex-ante economic and financial analysis. This baseline has to be confirmed with the results of the feasibility studies for the first 30 sub-projects to be performed in 2015. During implementation: M&E system by borrower, Mid-Term Review and Final Evaluation performed by consultants	Implementing Agency within MAGAP in Quito
Water users provided with new/improved irrigation and drainage services (number)	This indicator measures the number of water users who are provided with irrigation and drainage services under the Project.	Twice a year	M&E system by borrower (from lists of water users provided by WUA and feasibility studies), Mid-Term Review and Final Evaluation performed by consultants. There will be an analysis between the official cadaster of water users and the effective user or operator of the irrigation and drainage system, to support and make visible	Implementing Agency within MAGAP in Quito

			women's roles and participation.	
Water users provided with irrigation and drainage services - female (number)	No description provided.	same as previous	same as previous	same as previous

Intermediate Results Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Area provided with irrigation and drainage services (ha)	This indicator measures the total area of land provided with irrigation and drainage services under the Project, including in (i) the area provided with new irrigation and drainage services, and (ii) the area provided with improved irrigation and drainage services, expressed in hectare (ha).	Twice a year	M&E system by borrower (from cadastra of water users and areas provided by WUA; from work contractors documents), Mid-Term Review and Final Evaluation performed by consultants	Implementing Agency within MAGAP in Quito
Area provided with irrigation and drainage services - New (ha)	No description provided.	No description provided.	No description provided.	No description provided.
Area provided with irrigation and drainage services - Improved (ha)	No description provided.	No description provided.	No description provided.	No description provided.
Operational water user associations created and/or strengthened (number)	This indicator measures the number of water user associations created and/or strengthened under the Project that are operational.	Yearly	M&E system by borrower (data from Contracts of Technical Assistance within Component 2), Mid-Term Review and Final Evaluation performed by consultants	Implementing Agency within MAGAP in Quito
Clients who have adopted an improved agr.	This indicator measures the number of clients of the Project who have adopted an	Yearly.	This indicator is not considering new irrigation	M&E system by borrower (data from Contracts of

technology promoted by the Project	improved agricultural technology promoted by the Project. The assumption is 30% of the total of water users benefited by the Project.		techniques, which are supposed to be adopted by 100 percent. The improved agricultural technology considered are, inter alia: natural fences, sustainable land management practices, improvement of vegetation cover, use of organic matter as a natural fertilizer (as biological compost and others), use of nutrient fixing plants planted, mulching and improved plant cover, agricultural terraces, vegetation cover to reduce erosion, improved pasture management, including the cessation of fire use, establishment of drinking points for cattle, and rotational grazing, reforestation of degraded land, provision of support to protect natural forest and its biodiversity.	Technical Assistance within Component 2), Mid-Term Review and Final Evaluation performed by consultants
Clients who adopted an improved agr. technology promoted by Project – female	No description provided.	same as previous	same as previous	same as previous
Increase of Land use intensity	Ratio of: Cultivated area divided by Total arable land (in percent). Could be more than 100 percent if double cropping.	Yearly	- Baseline to be determined with baseline done using the results of the feasibility studies for the first 30 sub-projects.	Implementing Agency within MAGAP in Quito

			- M&E system by borrower (data from Contracts of Technical Assistance within Component 2), Mid-Term Review and Final Evaluation performed by consultants	
Sub-projects with post-Project community engagement or O&M arrangements (percent)	This indicator is likely to be most relevant for CDD-type projects and measures the existence of specific arrangements created under the Project to ensure ownership by Project beneficiaries. This indicator only applies for the WUA and the collective irrigation systems (not for the subprojects of individual water harvesting with ponds).	yearly	M&E system by borrower (data from contracts of TA under Component 2 and from Minutes signed between Project and WUA), Mid-Term Review and Final Evaluation performed by consultants. This indicator will be considered as achieved when the WUA will have enforce an irrigation fee and/or collective work (*minga*) that cover the needs for Operation and Maintenance of the irrigation scheme.	Implementing Agency within MAGAP in Quito
Sub-projects that are expected to have a mechanism for post-completion operation	This a supplemental indicator linked to previous one , except that it is in number of sub-projects and not in percentage	Same as previous	Same as previous	Same as previous
Client days of training provided (number)	This indicator measures the number of client days of training provided i.e. the number of clients who completed training multiplied by the duration of training expressed in days.	Twice a year	M&E system by borrower (from data sheets signed by beneficiary during training activities), Mid-Term Review and Final Evaluation performed by	Implementing Agency within MAGAP in Quito

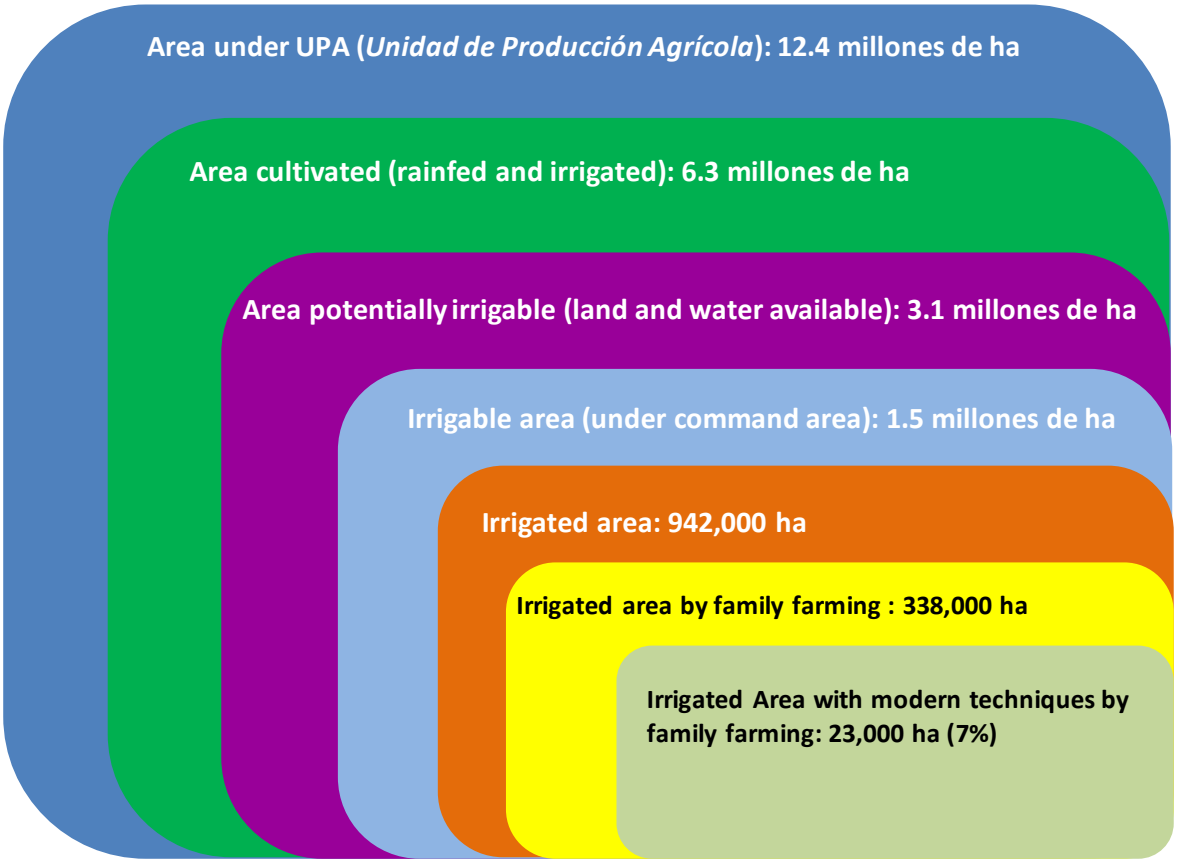
			consultants. This indicator will be calculated on the basis of 50 percent of total clients.	
Client days of training provided - Female (number)	No description provided.	No description provided.	No description provided.	No description provided.
Number of training days provided to MAGAP's or GADP's staff	This indicator measures the number of days of training provided i.e. the number of clients who completed training multiplied by the duration of training expressed in days.	Twice a year	M&E system by borrower (data sheets signed by staff during training activities). Calculated on the basis of eight modules, two days each, for 120 staff.	Implementing agency
Number of beneficiaries' organizations that received support from another MAGAP's or GADP's Project or Program	This indicator aims at measuring the cooperation and coordination of Project and Program.	Twice a year	M&E system by borrower and PIU progress reports confirming the budgeting of complementary financing from other Project and program (i.e. *Hombro a Hombro, Innovación, Buen Vivir*, etc.)	Implementing agency

Annex 2: Detailed Project Description

ECUADOR: Sustainable Family Farming Modernization Project

Diagnosis of beneficiaries' situation and Project justification

1. The below figure shows the main numbers regarding of area for the agriculture sector in Ecuador. It shows in particular: (i) the non-optimal use of equipped areas (only 942,000ha are irrigated out of 1.5 million ha of equipped area); (ii) the share of irrigated areas under family farming (less than one third, 338,000ha out of 942,000ha) and; (iii) the share of modern irrigation managed by family farming. The access to modern techniques of irrigation is only 7 percent for family farming (23,000 ha out of the 338,000ha) meanwhile the ratio at national level is 22 percent, according to the 2000 National Agriculture Census.



2. The Ecuadorian coastal region (*Costa*) has the largest area under UPA (*Unidad de Producción Agrícola*) and soil suitable for agriculture, and irrigated area of 490,373 ha, corresponding to 57 percent of the total irrigated area nationally. To this figure can be added some areas of the mountains that extend to the coast, although administratively correspond to highland provinces, for example in the provinces of Cañar, Chimborazo, Bolívar.

3. The area under UPA in the highlands (*Sierra*), according to the CNA III (2000), amounts to 4,762,331 ha, of which 31 percent is agricultural vocation and 69 percent correspond to areas

of natural pastures, mountains, forests, deserts and other uses. Of total agricultural area, only 362,255 ha are irrigated, i.e. 42 percent of the total irrigated area of the country.

4. The farming systems practiced in the areas of Project intervention are very diverse, responding to climate, topography, socio-economic conditions and productive farmers dynamic conditions. There are irrigation systems that favor export products such as bananas, cocoa; and others, which allow domestic consumption and food sovereignty with products like rice, beans, and vegetables, among others. In following table, the main crops are detailed in the intervention areas.

Province	Main crop		
	Crop	UPA	ha
Azuay	Maize	11.598	5.971
Bolívar	Maize	11.598	5.971
Cañar	Potatoes	4.435	1.864
Carchi	Potatoes	4.166	6.179
Cotopaxi	Maize	18.496	9.480
Chimborazo	Maize	22.304	14.886
Imbabura	Maize	4.888	4.863
Loja	Sugar cane	13.633	8.681
Pichincha	Maize	11.137	10.477
Tungurahua	Potatoes	19.414	7.380
El Oro	Cocoa	4.376	18.511
Esmeraldas	Cocoa	5.771	24.527
Guayas	Rice	35.737	184.539
Los Ríos	Rice	21.825	130.655
Manabí	Maize	22.610	53.111
Morona Santiago	Banana	6.071	6.252
Napo	Banana	2.068	1.838
Pastaza	Banana	2.378	2.687
Sucumbíos	Café	5.919	26.361
Orellana	Café	4.707	18.051
Areas under conflict	Cacao	1.157	6.323

5. Regarding land tenure, the area has a polarization of *minifundio*, with an average of 2.18ha / beneficiary. The following table shows the average amount of land per farmer by Province. It shows that the range for most of Provinces of the Sierra is from 1 to 2 ha (Azuay, Bolivar, Cañar, Tungurahua, Cotopaxi, etc.).

Province	Area irrigated (ha)	Area per family
Azuay	476	1,00
Bolívar	1.171	1,07
Cañar	1.953,5	1,17
Carchi	2.945,25	2,54
Chimborazo	5.233	3,12
Cotopaxi	1.139,5	1,21
El Oro	467,5	1,09
Esmeraldas	1.732,5	1,43
Guayas	13.971	2,62
Imbabura	4.225	2,31
Loja	2.875	1,66
Los Ríos	10.317	1,84
Manabí	6.515,5	2,18
Morona Santiago	187,5	1,25
Napo	187,5	1,25
Orellana	187,5	1,25
Pastaza	187,5	1,25
Pichincha	1.135,5	1,57
Santa Elena	3.100	9,69
Santo Domingo de los Tsáchilas	187,5	1,25
Sucumbíos	375	1,25
Tungurahua	6.029	1,92
Zona No Delimitada	375	1,25
Santa Elena	1.437,61	7,19
Average		**2,18**

Source: Secretaria de Riego y Drenaje, 2014

6. Of the total population, 88.62 percent live in poverty, justifying the Project intervene in these areas. In the below table, poverty rates by province are detailed.

Province	Unsatisfied Basic Needs (UBN) Rural Households (percent)	Province	Unsatisfied Basic Needs (UBN) Rural Households (percent)
Azuay	80,69	Manabí	95,23
Bolívar	88,93	Morona Santiago	87,42
Cañar	83,92	Napo	95,00
Carchi	80,55	Orellana	97,77
Chimborazo	92,52	Pastaza	93,27
Cotopaxi	91,06	Pichincha	75,78
El Oro	81,85	Santa Elena	86,28
Esmeraldas	90,49	Santo Domingo de los Tsáchilas	89,45
Guayas	93,64	Sucumbíos	93,07
Imbabura	77,49	Tungurahua	79,46
Loja	92,24	Zona no delimitada	88,87
Los Ríos	93,09		

Source: Censo de Población y Vivienda, 2010 (INEC, 2010)

7. The diagnosis done during the construction of the National Plan for Irrigation and Drainage 2012-2017 showed that lack of water resources has become more evident in areas where seasonal water deficit is marked, appearing seasons in which they were previously sufficient rainfall for the least one harvest, are now in deficit.

8. In additional to the lack of water availability, the losses in the application of traditional irrigation, furrow or flood, are significant for several reasons. The Sierra has an efficiency of irrigation water use at the farm level of 60 percent, while for the Costa, efficiency is 62 percent, giving a national average of 62 percent.

9. Among the problems that affect the efficient use of water are: (i) topographical conditions (steep slopes); (ii) the sliding geology of soils; (iii) poor maintenance of irrigation infrastructure; (iv) huge fluctuation of water flows; (v) high losses during the night and in times of abundance flow; (vi) inappropriate irrigation techniques and; (vii) land fragmentation and dispersion of plots.

10. Increasing irrigation efficiency is vital to maximize the number of beneficiaries and the use the available flows as well as to initiate a process of modernization of agricultural production, intensification (with production during dry season) and of improvement of product quality and of soil management (reduction of erosion through localized irrigation). Due to water scarcity, demand pressurized irrigation (sprinkler and drip) is growing slowly, as an alternative method to improve the efficiency of application, to replace widespread application systems such as furrow irrigation. These methods require a significant investment and a more intensive and specialized management.

11. The public sector support is imperative for small and medium farmers to access to modern irrigation systems to increase the efficiency of use and utilization of water resources due to the inability of these sectors to finance this type of technology. This social investment is justified by the improvement of rural livelihoods and contribution to sovereignty and food security in rural and

social in general family level. Social investment is entirely justified by the positive influences derived from efficient use of resources, improving rural living conditions, the contribution to sovereignty and food security and rural social family level and, above all, by the important contribution to national development in general.[19]

12. The implementation of this Project will increase access to modern irrigation, improving the use and utilization of water resources, contributing to the change of the productive matrix, rural development and food sovereignty, efficient management, improving skills, increasing the quality of life of the beneficiary population.

Project Description

13. The Project Development Objective is to enhance sustainable incomes of small and medium sized farm households by supporting more productive and climate-smart use for land and water.

14. The Project supports a framework program to strengthen sustainable modernization and intensification of agriculture systems with an emphasis on beneficiary and community participation. The Project will support: (i) demand-based investment subprojects by beneficiaries' organizations; (ii) capacity-building activities that strengthen national and local institutions (MAGAP, GADP, mainly) and farmers' organizations; (ii) training and technical assistance to enhance productivity, increase value-added and improve market access; and, (iii) small investments to protect natural resources linked to the subprojects.

15. In addition to this, the proposed Project will coordinate and draw on the experiences of a broader investment program comprised of three large operations being led by MAGAP until 2017: (i) the Strategy *Hombro a Hombro* (Shoulder by Shoulder) which invests about US$ 30 M per year to establish a new model of agricultural extension services currently reaching 10 Andean provinces with nearly 1,000 agricultural technicians, and supporting investments on seed production, agricultural mechanization, agricultural inputs and processing facilities, amongst others; (ii) the *Buen Vivir Rural* Program (Rural Living Well Program) funded by IFAD and focused on 41,000 poor families in extreme poverty through investments in associative sub-projects in 12 Andean and coastal provinces; (iii) the Technological Innovation Project (also known as PITPPA) which is a multi-year, USD 417 M Project that would benefit 400,000 small farmers throughout the country, operating as an umbrella Project to implement direct investments

16. The proposed Project (US$80 million in IBRD financing and US$20 million of co-financing from the Spanish Cooperation/AECID) will be implemented over a period of five years and comprises three components: (1) Investments for climate-smart sub-projects; (2) Capacity building for institutional stakeholders and beneficiaries' organizations and; (3) Project Management.

17. The total cost of the Project is US$128.6 million, financed by a US$80.0 million loan from IBRD, a US$20.0 million loan from AECID, MAGAP's counterpart of US$20.0 million, and US$8.6 million in beneficiary contribution.

18. AECID will provide a total co-financing of US$ 20 million to be split between components 1 and 3. The AECID will only finance sub-projects on MAGAP's Zone 1 (Provinces of

[19] Ministerio de Agricultura, Ganadería, Acuacultura y Pesca- Subsecretaría de Riego y Drenaje, 2013, Plan Nacional de Riego y Drenaje 2012-2027.

Esmeraldas, Carchi, Imbabura and Sucumbios) and Zone 3 (Provinces of Pastaza, Cotopaxi, Tungurahua and Chimborazo). Sub-projects under Component 1 will be under parallel financing from World Bank or AECID (i.e., a sub-project will be either financed by World Bank or AECID). For Component 3, the AECID will also finance the operational costs (including technical staffing) of the Project for the two *Zonales* Offices (Zone 1 and 3). For Component 3, the World Bank will finance operational costs (including technical staffing) of the Project for the 5 other *Zonales* Offices.

	Components	World Bank (US$M)	AECID Loan (US$M)	Co-financing (US$M)		Total (US$M)
				MAGAP	Beneficiaries	
1	**Investments for climate-smart sub-projects**	**67.7**	**18.2**	**12.3**	**8.6**	**106.8**
1.1	*Productive investments*	*63.4*	*17.0*	*11.6*	*8.0*	*100*
1.2	*Improvement of Agricultural, Water and Soil management Practices*	*4.3*	*1.2*	*0.7*	*0.6*	*6.8*
2	**Capacity building for institutional stakeholders and beneficiaries' organizations**	**5.6**		**0.7**		**6.3**
3	**Project Management**	**6.7**	**1.8**	**7.0**		**15.5**
	TOTAL	**80.0**	**20.0**	**20.0**	**8.6**	**128.6**

	Components	Project cost Total (US$M)	IBRD Financing (US$M)	IBRD Financing (percent)
1	**Investments for climate-smart sub-projects**	**106.8**	**67.7**	**63%**
1.1	*Sub-projects of Productive investments*	*100*	*63.4*	*63%*
1.2	*Subprojects of Improvement of Agricultural, Water and Soil management Practices*	*6.8*	*4.3*	*63%*
2	**Capacity building for institutional stakeholders and beneficiaries' organizations**	**6.3**	**5.6**	**89%**
3	**Project Management**	**15.5**	**6.7**	**43%**
	TOTAL PROJECT COSTS	**128.6**	**80.0**	**62%**

Component 1: Investments for climate-smart sub-projects

Subcomponent 1.1: Productive Investments

19. This sub-component 1.1 will finance subprojects aligned with the Project objective and provincial priorities related to the following investments: (i) Collective and/or individual on-farm investments for modernization of irrigation techniques (drip, sprinkler or modern gravity techniques) on existing irrigation systems; and (ii) individual and/or collective small water storages (ponds) and on-farm system.

20. Subproject proposals will be reviewed against a set of objective criteria in order to be eligible for financing, including consistency with Project objectives and scope. To ensure the balanced and equitable allocation of public funding, subproject preparation will include specific selection criteria to be applied early on in the selection and approval process, which will include: (i) demand expressed by the potential beneficiaries, which should have sufficient organizational capacity to manage sustainable infrastructure; (ii) compliance with the requirements of beneficiaries' profile (small and medium farmers); (iii) have the agreement or acknowledgment of the GADP; (iv) valid water use concession granted by SENAGUA; (v) financial profitability presented in the Project profile and validated by the Project Implementation Unit (PIU) of the Project; (vi) social and environmental sustainability justified in the Project profile and validated by the PIU and compliance with safeguards; (vii) compliance with investment criteria (e.g. - investment ceiling per hectare) and; (viii) land titles or, for those farmers who are not yet legal land owners but only *posesionarios*, the alternative legal instruments described in Annex 8. Subproject activities that may affect International Waterways will not be eligible. Details will be elaborated in the implementation manual.

21. **Participation of GADPs and other stakeholders.** The MAGAP will establish new or use existing provincial or lower level, formal Articulation Roundtables[20] with main institutional key players in rural development (GADPs, NGOs, other MAGAP's projects and programs, etc.). The Roundtables will be entitled to give their agreement to the sub-projects' profiles. Minutes of meetings will record all the comments, agreements and commitments. After agreement of profile, the next stages of sub-project preparation (pre-feasibility, feasibility, design) will be procured by the PIU in Quito. The final technical studies (including economic, environmental and social dimensions) will need to be validated by the beneficiaries' organization and the Articulation Roundtables before the contracting and procurement of works.

Sub-project cycle

22. The subproject cycle establishes an arrangement of the different phases and activities to be followed during the preparation of investment subprojects and the institutional stakeholders/agencies responsible for its implementation. The different phases defined aim at ensuring compliance with the following Project objectives:

23. A bottom-top approach on the identification and definition of the investment initiatives.

24. Strong beneficiary participation in subproject identification, preparation, implementation, supervision, evaluation, and long-term administration will be essential.

25. The subproject activities and investments should be implemented accordingly to the

[20] Mesas de Desarrollo Territorial.

competences of Provincial Governments under the current Constitution.

26. Moreover, the subproject activities will include the required technical assistance and investments in agricultural, post-harvest, value addition, business, and market development. The financing mechanism for these activities is described in Component 2.

27. The proposed sub-project cycle for Sub-component 1.1 is divided into six main phases: (i) Identification, (ii) Pre-feasibility, (iii) Feasibility / Pre-investment, (iv) Procurement process and implementation of Investment, (v) Technical assistance and support activities, (vi) Closing and transfer of the investments to the beneficiaries, as it is described on the following table.

i – Subproject Identification	
1	**Dissemination of Project activities**: The Regional MAGAP Offices and Zonal Office Project staff, with the support of the Communication Unit of MAGAP, will facilitate dissemination of information and eligibility criteria, and promote participatory interactions between public and private sectors to identify subprojects aligned with the Project objective and provincial priorities.
2	**Call for proposal:** To gather forma application from Farmers' Organizations (FO) resulting from the dissemination/communication activities, SDR will launch periodic calls for proposals, with support of PIU
3	**Presentation of FO's demands**: The application of Farmers' Organizations (FO) should be submitted to the Zonal MAGAP Offices accompanied by the following documents, if available: • Formal Demand of the corresponding Farmers' Organizations (complementary information defined in the profile form of the OM). • Accreditation to be a recognized organization or disposition to obtain accreditation from MAGAP as a formal producer organization. • Legal water right or feasibility of water use granted by SENAGUA. • Information on land tenure situation: land titles or other evidences of secure land tenure accepted by the Project as per Annex 9.
ii – Prefeasibility	
4	**Subproject profiles preparation**: The profile will be prepared by the technical teams of the Regional MAGAP and/or the corresponding Zonal Project teams, who will do an initial assessment of FO formal demand.
5	**Completion of Profile Form:** Field visits will be carried out by the technical teams of the Regional MAGAP and/or the corresponding Zonal Project team and existing local extension officers, to complete information of profile form (characterization of beneficiaries, productive area, potential market opportunities and commercial partnerships, expected benefits, identification of proposed works, investment budget estimations, general assessment of safeguards, detailed land tenure situation etc.). There will be a compliance screening of eligibility criteria.
6	**Presentation of Technical Dossier**: The Technical Dossier, which includes the subprojects profiles form and support documentation (including minutes of commitment signed by FO), will be presented to the Provincial Articulation Roundtables[21], which will have the participation of the main institutional key players in rural development (GADPs,

[21] Mesa de Articulación Provincial.

	SENAGUA, NGOs, other MAGAP's projects and programs, local extension officers, etc.). The objective of these roundtables are: • Identification of synergies and potential articulation and agreements between different programs (Hombro a Hombro, Buen Vivir, Innovación, GADPs, ONGs, and other local offers) • Evaluation of the provided documentation and the compliance of initial eligibility criteria. • Preparation of a report and summary of recommendation to be sent to the Evaluation Committee.
7	**Submission of Technical Dossier**: The Zonal PIU will send the subproject Technical Dossier to the Central PIU (Quito) and central office of MAGAP for the corresponding technical dossier evaluation following the eligibility criteria.
8	**Technical Dossier evaluation**: The technical dossier evaluations and prioritization will be in charge of the Evaluation and Coordination Committee[22]. The Committee will be composed of staff from the PIU, from the SRD and representative members of other MAGAP's projects and programs. The Committee will develop an analysis and prioritization of subproject profiles sent by the different Zonal PIUs, according with the following prioritization criteria: number of beneficiaries (householders' men and women), economic, social and environmental impacts, distribution of available budgets by area (both for pre investment and for investment), quantity of improved and/or extended irrigation areas, existence of potential cooperation with other programs, etc.
9	**Financiers' No Objection (NO)**: During the first year of implementation, all the selected and prioritized profiles accompanied by a technical report based on the aforementioned evaluation will be send by the Central unit of PIU to the Bank and AECID No Objection. For the following years of implementation, only a sample of profiles will be sent if the technical design is similar to the previous ones. All subproject profiles with a new technical design will be sent for NO.
iii - Feasibility and pre-investment phase	
10	**Preparation of TOR for Subproject Design**: The Project will finance the pre-investment process of selected subproject profiles and the preparation of documents required for approval. The Project team at Zonal Level and local MAGAP teams will supervise and provide guidance as needed through support from applicable units. The preparation of procurement documents for the subproject preparation should consider and ensure an integrated, multidisciplinary and comprehensive approach from the technical, economic, productive, market, social, and environmental point of view. The study will generate complementary information for the land titling process (under the responsibility of MAGAP's *Subsecretaria de Tierras*). The Terms of Reference will be prepared by the Zonal PIU with the support of the Central Unit of the PIU in Quito and Central SDR. The consolidation of the final version of the documents following standard Bank formats will be prepared by the Central PIU.

[22]. Comité de Evaluación y Coordinación

11	**Procurement Process for Sub Project Preparation:** Once included in the PAC, the PIU will be responsible for the procurement process for the selection and contract of the consulting firm for subproject preparation.
12	**Subprojects Preparation:** For the supervision and follow up of subproject preparation, the Central PIU will be in charge of the appointment and designation of an inspector from the Zonal PIU and the supervision from the MAGAP Zonal Office During the Preparation of the Subproject, the following Phases should be accomplished under an intense and documented participatory process with the representative of the Farmers' Organization: (i) Diagnosis, (ii) Analysis and selection of alternatives, (iii) Final design and budget preparation of the selected alternative, including formal agreement by FO for the contribution in kind (manpower and local material). The subproject should be technically sound, incorporating technologies that are not only state-of-the-art, but also appropriate given the economic and social conditions of the beneficiaries and cost-effectiveness considerations. The subproject preparation will include **a feasibility study with technical designs of the modernized irrigation system**. The design of the subproject will also include the preparation of two Plans to guide the provision of the necessary Technical Assistance, Training and Investments to Producers Associations and farmers in the short and medium terms, namely: (i) modernized on-farm irrigation management; (ii) improving agricultural production and productivity; (iii) post-harvest and value-adding; (iv) business and market development to improve their participation in value chains and likely establishment of productive alliances[23] with other commercial partners; (v) administration, operation and maintenance of modern irrigation systems; and (vi) the rational use and responsible management of pesticides, as well as sustainable environmental management. Based on the context of each subproject and the scope of the related MAGAP's programs, some of these activities for the short term will be part of a **Technical Assistance and Training Plan (for up to 12 months)** to be financed by Component 2, whereas similar and complementary activities for the medium term will be part of an **Agricultural Development Plan** (for complementary support on climate smart agricultural innovation, business development support and investments). The subproject will also include the necessary activities to improve or protect natural resources and biodiversity and promote sound, sustainable, environmental management. The consultant in charge of the design will define the complementary activities with other Projects of MAGAP. In any case, the proposal will include the necessary budget and plan of implementation as if it would be implemented by a firm or NGO. When the subproject includes activities in the communal system, the PIU will ensure the appropriate coordination with the relevant GADP which will be reflected in a written agreement. The subproject's net income generated by the subproject will need to be sufficient to adequately cover administrative and O&M costs and, to the extent determined by the specific province, investment costs. Foremost, subproject proposals will have to be completed with all supporting documentation.

[23] As per the World Bank, a Productive Alliance is an agreement between organizations of small producers and the commercial private sector (i.e. agribusiness firms) to respectively produce and purchase agreed quantities of produce of a specific quality at an agreed reference price during certain period.

13	**Sub Project Presentation:** Fully developed subproject proposals will be sent directly to PIU in Quito to be evaluated.
14	**Sub project Evaluation:** The Evaluation will be carried out by the Zonal and Central PIU and MAGAP programs, and will be in charge to assess the soundness of the subproject, which will then be evaluated according to the following technical factors among other defined on the Operation Manual: (i) beneficiary participation/co-financing; (ii) technical, commercial, social and environmental evaluation and accomplishment of eligibility criteria; (iii) indicators of investment under ceiling; (iv) financial viability and sustainability; (v) economic return; (vi) compliance with social and environmental safeguards, (vii) risk analysis; and (viii) cost recovery mechanism (including full O&M costs thru irrigation fee and collective work. Known as *Minga* in the Sierra Region). Complementary at this phase, the corresponding proposal should have to be completed with all supporting final documentation related to: (i) Accreditation of land tenure situation: land titles or other evidences of secure land tenure accepted by the Project as per Annex 8, (ii) formal accreditation of the FO by MAGAP, (iii) Legalization / feasibility of water use by SENAGUA and (iv) Formal partnerships with programs MAGAP as needed. The Central unit of the PIU will issue its recommendation for approval by the Evaluation Committee, as appropriate, through a technical report based on the aforementioned evaluation.
15	**Subproject Approval**: The Evaluation Committee will approve subproject financing and will commit complementary support from MAGAP partner programs. A defined sample of the Technical reports with all the necessary support documentation will be sent to the Bank and AECID for No Objection. If Evaluation Committee considers relevant to approve a subproject that does not comply with some eligibility criteria, it will submit the proposal with the rationale for an exception, seeking World Bank and AECID no objection.
16	**Communication of Subproject approval:** Once the subproject funding is approved a formal communication will be sent to the corresponding FO and to the Provincial Articulation Roundtables.
17	**Subproject Agreement**: a subproject Agreement will be signed between the Project and the Farmer's Organization and, as the case may be, other participating entities (GADP, NGO, Implementing agencies of MAGAP's Agricultural Programs, bilateral and multilateral organizations, etc.).
iv - Procurement process and implementation of Investment	
18	**Works Procurement Process:** Once approved by the Coordinator, the PIU will update the PAC and start the corresponding procurement process. Works and supervision contracts will be procured by the PIU following the Bank guidelines as described in the Operational Manual. A social oversight committee will be established, which is composed by three FO representatives (at least one women) and support provided by one Zonal MAGAP officer.

v - Technical Assistance and support activities.	
19	Technical and commercial plan is included and implemented in the proposal, combining physical investments with technical assistance and capacity building from agricultural production to commercialization and development of market alliances whenever possible. As aforementioned, this integrated approach should be defined with active participation of MAGAP's programs during the preparation subproject phase and will be part of the pre investment activities. The Procurement process for the Technical Assistance, (both on management and O&M and for productive and commercial support and promotion) will follow Bank procedures according with OM considerations. The TA and investment activities will be implemented in close coordination with the corresponding GADPs, by *Hombro a Hombro, Buen Vivir and Innovación* MAGAP programs as defined on the subprojects documents. When the engagement of MAGAP's programs is not possible, the Project will ensure the financing and will foresee the implementation of TA activities by a firm or NGO.
vi - Closing and transfer of the investments to the beneficiaries	
20	At the conclusion of the infrastructure the PIU should organize the documentation for a formal transfer of the new or rehabilitated infrastructures to the beneficiaries, either to the individual beneficiary, either to the water users organization (or the GADPs) in charge of Administration, Operation and Maintenance.

28. The current proposed investment ceilings for sub-projects of Sub-component 1.1 are the following:

29. For Type 1, corresponding to Investments in existing irrigation systems, the ceilings depending on the area of the schemes are:

Nº-	**Range of equipped Area (ha)**	**Investment ceiling US$ / ha**
1	Less than 15	8,700
2	15.1 – 30.0	8,100
3	30.1- 60.0	7,200
4	60.1 – 150.0	5,850
5	More than 150	5,650

30. For Type 2, corresponding to investments of new reservoir and complementary on-farm irrigation systems, the estimated ceiling is 7,500 US$/ha.

31. The average amounts estimated per ha are the following:

a. Collective and/or individual on-farm investments for modernization of irrigation techniques (drip, sprinkler or modern gravity techniques) on existing irrigation systems: US$ 6,175 / ha.

b. Individual and/or collective small water storages (ponds) and on-farm system: US$ 6,285 / ha.

32. Sub-component 1.1 will finance works, consulting and non-consulting services, training and workshops and goods and equipment. The selection will be done during appraisal stage within the current MAGAP's pipeline of subprojects and will be subject to the criteria identified in the operation manual.

Subcomponent 1.2: Improvement of Agricultural, Water and Soil Management Practices

33. Since the sub-projects will be applied nationwide, it is expected that the selected sites will be located in several provinces; therefore they will be very different in terms of geography, climate, biodiversity, population density, land use, productive potential, ongoing development programs, availability of potential partners, etc. Thus, the design of the activities will be defined according to the demands generated by the subprojects proposed under subcomponent 1.1. This will be done thru a participatory process which will involve a multidisciplinary team which includes an environmental specialist to ensure adequate integration of environmental aspects. The following description of the sub-component and the various activities is an overall description. The Project will adopt a flexible approach that will allow modifying activities according to needs, on-going programs and collaboration potentials with partners who are already working in the Project areas.

34. Critical risks include: (i) farmers may be hesitant to participate in activities as they fear not to directly benefit from environmental improvements. The Project will remain flexible with the response depending on the analysis and the feasibility of implementing the various solutions; (ii) the handing over of land rights to local community groups could be perceived by some as threat to free access to natural resources (such as water). The Project will establish and strengthen communication and negotiation platforms. By forming networks of community groups, local communities will be in a stronger position to withstand outside interference.

35. Small investments in best agricultural practices to implement climate smart agriculture activities linked to the subprojects of subcomponent 1.1. The sub-component will adopt an integrated and participatory approach intended to encourage rural populations to manage their land and natural resources in a more sustainable manner. This would also support building and strengthening the capacity of beneficiaries to adopt new farming techniques to: (i) getting higher yields, (ii) improving the resilience of their crops to the impact of climate change and (iii) fortifying soils that sequester more carbon. Thus, the sub-component would contribute to: (i) promoting agricultural best practices, particularly integrated crop management, conservation agriculture, intercropping, improved seeds and fertilizer management practices; (ii) increase productivity and sustainability of agricultural production based on agro-ecological and agroforestry technologies; and (iii) strengthen the management of sustainable agriculture to improve the environment and living conditions and reinforcing local and cultural identity. The necessary local capacity to implement these small investments on the ground will be developed

thorough activities described under Component 2.

36. Examples for these small investments could be: (a) determining and implementing, through participatory intervention, local strategies for controlling erosion, arresting gullies and reducing the sediment load of river runoff. Some activities will focus on strategic anti-erosion works (through, among others, biological methods and technologies); and (b) interventions on communally owned land to improve plant cover, reforestation and pastures through strengthened technologies and management transfer of natural resources.

37. Concrete investments, depending on the site, could be the following:

a. Shelter belt and wind breaks (natural fences), including reforestation using seeding and native or indigenous shrubs and trees (within plots).
b. Implementing sustainable land management practices, increasing infiltration rates in soil through padding and improving vegetation cover.
c. Sustainable land management practices, increasing infiltration rates in the soil through mulching, and improved plant cover.
d. Improving soil fertility through (i) use of organic matter as a natural fertilizer (as biological compost and others), and (ii) the importance of nutrient fixing plants planted either in sequence, intercropped or in rotation; (iii) agricultural terraces, and other good practices; (iv) diversification of agriculture products and the development of productive value chains and markets.
e. Conservation and efficient management of irrigation water.
f. Reestablishing vegetation cover to reduce erosion to improve the land use productivity of the lands: (a) improved pasture management, including the cessation of fire use, establishment of drinking points for cattle, and rotational grazing; (b) awareness raising campaigns that address destructive traditional practices such as fire use for pasture and agriculture, and providing support in developing technical alternatives with a participatory approach; (c) reforestation of degraded land; (d) provision of support to protect natural forest and its biodiversity.

38. The sub-component will finance small works, consulting and non-consulting services, and goods. Complementary training and workshops necessary to build and strengthen capacity of MAGAP and its decentralized offices, community based organizations and individual beneficiaries will be developed thorough activities described under component 2. These activities will be implemented thru different modalities: (i) in the works contract (together with investments under Subcomponent 1.1) or (ii) in a different contract with local firm or NGOs.

2. Component 2: Capacity building for institutional stakeholders and beneficiaries' organizations

39. Focusing on improving and supporting the outcomes of the subproject investments of Component 1, this Component will provide technical assistance and training services to:

a. Optimize the operation, administration, and productive use of the off- and on-farm irrigation systems and water ponds that will be improved or built under Subcomponent 1.1.
b. Strengthen productive, organizational and business capacities of producer groups as well as broad activities fostering smallholder linkages to markets, and

c. Improve the environmental management of Project investments (works) supported by Component 1.

40. **Training and Technical Assistance**. Identification and design of all the required technical support will be carried out as part of the feasibility studies of the subprojects financed under subcomponent 1.1 (see the Project cycle above). These activities will be planned and financed as follows:

41. The design of each subproject will include a **Training and Technical Assistance Plan** on the following themes:

a. **Operation, maintenance, and administration of irrigation** systems to ensure optimal service and sustainability. This plan will be implemented for up to 12 months and will be financed by component 2; it will be outsourced to technical service providers and monitored by MAGAP, producers' organizations, and Project staff. Activities to be financed include, inter alia: training on management and optimization of off- and on-farm irrigation systems and water ponds, administration, operation, and maintenance of collective irrigation systems.

b. **Agricultural innovation technologies, post-harvest, value adding and commercialization aspects** for each subproject and group or producers. These activities will support producers' organizations for up to 12 months and might be financed by Component 2; they would be outsourced to technical service providers and monitored by MAGAP. Activities to be financed include, inter alia: adoption of good agricultural practices, including smallholder climate smart agriculture, to improve production and productivity; value-addition and post-harvest management; improvement of market linkages and access of small-size producers to agricultural value chains, including the promotion of productive alliances with other private sector and financial partners whenever possible; organizational development and legal advice; improvement of local supply of technical services available to producers by building capacity amongst key institutional stakeholders (i.e. MAGAP central and territorial offices, provincial and municipal GADPs, and local providers of agricultural technical services).

c. **Environmental management** linked with investments of Component 1. The Component will finance training and capacity building of Sustainable Land Management (SLM) groups, and of local and regional staff on, amongst others: natural resource management (i.e. training for cattle herders and their associations; rational and responsible management of pesticides, non-chemical methods of pest management; environmental awareness raising campaigns; specific training to local and regional technical services providers (i.e., NGOs, public institutions) in agro-ecological techniques or participatory planning methodologies; as well as support participation of Project beneficiaries in existing communication and negotiation platforms on, inter alia, watershed management plans, producers' roundtables,

42. **Production and Marketing Support activities and investments.** On the other hand, the demand-driven and market-orientation nature of the sub-projects design financed by subcomponent 1.1 will also include the preparation of an Agricultural Development Plan comprised of medium-term production and marketing support activities to contribute to

commercial feasibility of Project investments. This Agricultural Development Plan will include the required organizational and business development technical activities and investments to help producers and their organizations improve production, post-harvest, value-adding, access to value-chains and markets, in order to create productive alliances with other partners along the chain, with the aim of improving their commercial success and income generation. The Agricultural Development Plan will synchronically be financed by GADPs and other MAGAP units/programs (i.e. Hombro a Hombro, Buen Vivir Rural, Innovación - PITPPA), on the basis of the intra-institutional collaboration agreement to be executed and enforced by MAGAP authority as part of the institutional arrangements for the Project. The arrangement is described in Annex 3.

43. Investments and technical business development support to be financed by GADPs and MAGAP programs will be prepared following the particular procedures and criteria of these programs. To ensure optimal synchronization, representatives of these programs will participate in the Provincial Articulation Roundtables, and Project Evaluation and Coordination Committees at territorial and central levels to identify ahead of time (i.e. during preparation of the profiles and of the feasibility studies of subproject investments) and materialize opportunities for synergy, while MAGAP authorities will enforce the required intra-institutional coordination.

44. Additionally and whenever necessary, this component will prepare general analytical information, i.e. diagnostics of relevant productive systems, catalogs of agricultural technologies and climate-smart innovations, analysis and mapping of agricultural value chains, assessment of chains' functionality and existing gaps, logistics assessments, promotion of linkages with partners across the value chains (including inputs and service suppliers, lead firms, financial services, commercial roundtables, preparation of rural/productive alliances, etc.), analysis of quality standards and opportunities to sell in special markets, and other activities under a value-chain development approach, and characterization of commercial opportunities to improve access to markets for beneficiary groups. This information will be important to inform the preparation of technical assistance and training plans and other tailor-made support to producers during commercialization, as well as to materialize opportunities for complementary support with investments and medium-term business development support by other MAGAP's programs.

45. Component 2 will finance consulting and non-consulting services, training, workshops and goods. The objectives, implementation strategy, activities, and expected results of this component will be described in the Operational Manual, including the operational procedures to ensure that the complementary technical and investment support from other MAGAP programs take place in a timely fashion and is synchronized with other Project support.

3. Component 3: Project Management

46. This component will support: (i) the functioning of the Central Unit of the Project Implementation Unit (PIU) to be installed within the Under-Secretariat of Irrigation and Drainage in the MAGAP in Quito and; (ii) eligible costs and staffing related to the Project on 7 decentralized offices of MAGAP (*Zonales*)[24]. The component will also finance Monitoring and Evaluation, impact evaluations, progress reports, and audits.

47. The Central Unit of the Project Implementation Unit (PIU) will be responsible for the overall administration of the Project, within the MAGAP in Quito. The PIU in Quito will be

[24] Zonal 1: Imbarra / Zonal 2: Tena / Zonal 3: Riobamba / Zonal 4: Porto Viejo / Zonal 5:Guayaquil/ Zonal 6: Macas/ Zonal 7: Machala

responsible for all the procurement activities during Year 1 and will transfer responsibilities to the *Zonales* upon creation of local capacities, as described in Annex 2 and Operation Manual. Component 3 will finance: consulting and non-consulting services, training and workshops, small works, goods and equipment and operating costs.

Lessons Learned and Reflected in the Project Design

48. The proposed Project was built on the successful model of the PIDD in Chimborazo Province (P094784). The PIDD[25] financed subprojects of modernization works for 55 small and medium scale collective irrigation systems, benefiting 4,685 ha and 7,900 families. The PIDD generated a substantial body of lessons including: (i) the necessity of combining physical investments with capacity building; (ii) the need to frontloading technical assistance and training to the institutional stakeholders; (iii) the need to build beneficiary's ownership by following a demand-driven and participatory approach in which WUAs/farmers' groups participate in subproject design, financing, execution and supervision and are fully responsible for Operation & Maintenance; and (iv) the importance of thinking scalability. The Project cycle developed by the PIDD, especially the effective participation of beneficiaries from the design to the construction, has been adopted by the Provincial Government of Chimborazo as a public policy to develop any investment intervention in the future.

49. In addition, the PIDD has several other lessons learned for:

a) **Monitoring and evaluation:** The products of Project M&E were unusually complete, exceeding many larger, national and sub-national projects with extensive track records of engagement with the Bank and leaving a database which is already proving valuable for further investment planning. Such performance requires complete buy-in to a coherent progression of research/reporting throughout, on the part of both the Borrower and the Bank teams. The permanent presence of an M&E specialist in the implementation unit is essential not only to the products generated but instilling the idea of M&E and institutionalizing its practices. A key contributing factor was the continuity of the consulting firm initially contracted to conduct the Baseline study, then going on to prepare all subsequent evaluations.

b) **Indirect benefits and key transformations:** The indirect benefits of a well-conceived investment operation can be considerable and important. In this case, the strong emphasis on local institutional capacity-building based on standards, rules, rights and responsibilities had a marked impact on reducing conflict among irrigator communities, liberating them to focus on agricultural advancement rather than the constant and corrosive struggle for water. Similarly, while not a core Project goal, employment creation was the natural offshoot of providing families with the means to expand agricultural production and hire labor. The inclusive, participatory methodology successfully increased the visibility of indigenous families and women. These transformations were not formally described at appraisal but emerged from the combination of investment and well-planned capacity-building activities, the hard and soft elements of a good Project.

[25] Proyecto de Inversiones de Desarrollo Productivo, closed in June 2014

c) **Technical transformation and behavior change:** Demonstration plots showed farmers the productive impacts of modern farming techniques and there was selective adoption in the wider communities. The design, content and delivery – including culturally appropriate social mobilization behind and communicating the desirability of change – along with reliable, continuous technical and financial support, market intelligence, and productive organization and entrepreneurship, are basic pre-requisites to secure farmer buy-in.

50. The proposed Project was also designed taking into account some lessons learned from other similar operations in the region such as, for example, the PSI Sierra in Peru (P104760), which has very similar scope, activities and target group, or the PROSAP (P106684) in Argentina, which can bring experience on the construction of the Project framework and the progressive process of delegating responsibilities to the sub-national level (Provinces).

Annex 3: Implementation Arrangements

ECUADOR: Sustainable Family Farming Modernization Project

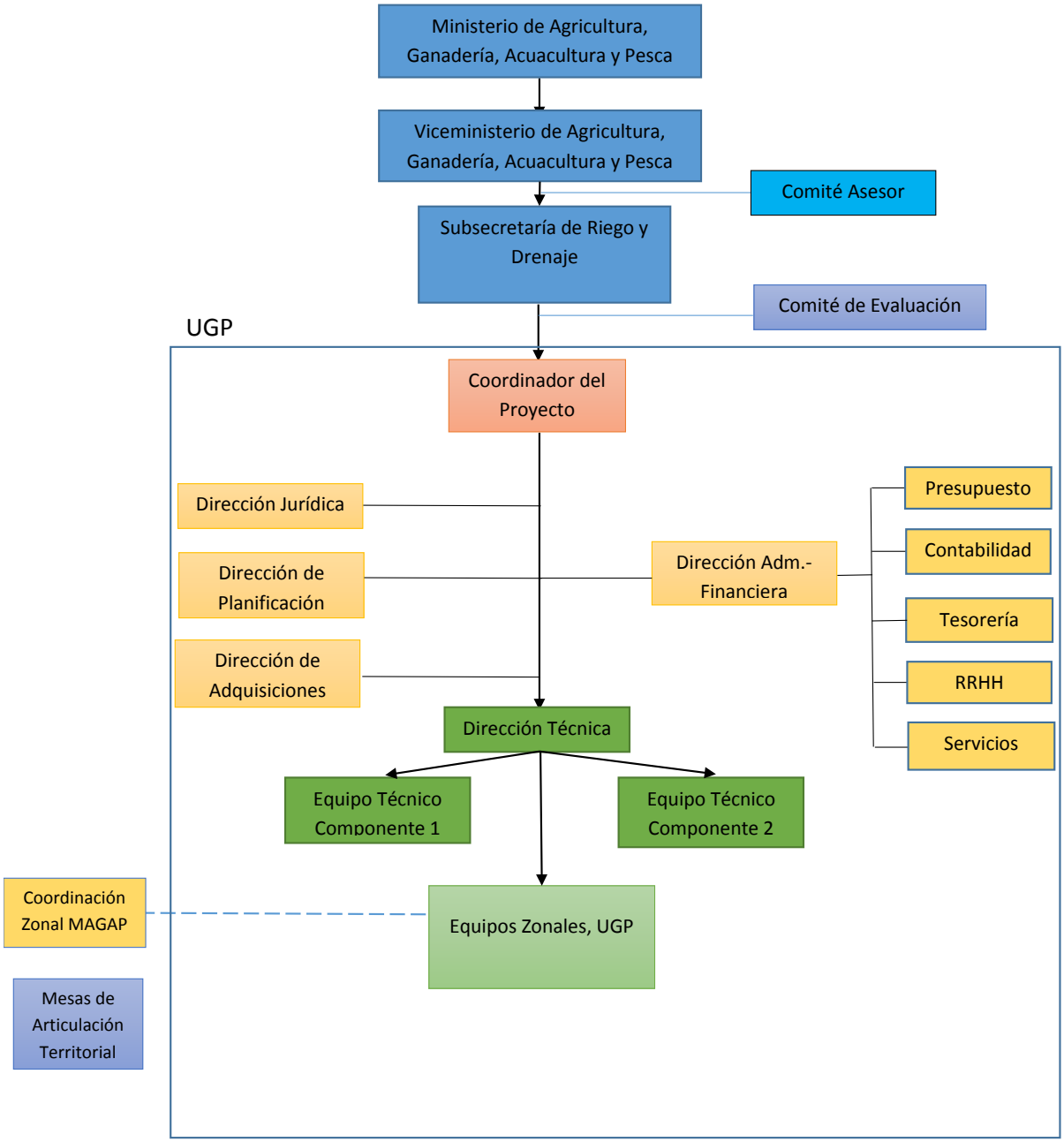
Project administration mechanisms

1. **Proposed implementing agency.** The Project will be implemented by the *Subsecretaría de Riego y Drenaje* under the *Vice Ministerio de Desarrollo Rural* of the *Ministerio de Agricultura, Ganadería, Acuacultura y Pesca* (MAGAP). The co-financed WB/AECID Project will be inserted under a broader Program of the MAGAP called "Promotion of agricultural production through the implementation of systems of use and utilization of water resources for rural development and food sovereignty[26]". The Program has an estimated budget of US$ 205 million for the 2014-2017 period with expected impacts on 66,400 ha and 31,800 families. It was agreed that the Project financed by the World Bank and the AECID will support the aforementioned Program except the component focused on the large-scale and multipurpose projects, since there is no information on the scope, productive approach and implementation timelines for these multipurpose projects.

2. **Project Management.** For the Project management, MAGAP will create a dedicated Project Implementation Unit (PIU) under the responsibility of its Under-Secretary of Irrigation and Drainage. By legal ministerial decision[27], the PIU shall acquire the status of a Decentralized Operational Entity (*Entidad Operativa Desconcentrada* or EOD). The MAGAP will hire, under local co-financing, a team of fully dedicated professionals to ensure the proper implementation of Project activities and be responsible for planning, administrative and financial management, legal aspects, procurement and overall monitoring and evaluation activities (M&E). The technical experts (hydraulic engineers and agronomists) as well as the experts for environmental and social safeguards will be hired as consultant and their costs will be funded by the loans from World Bank and AECID. The proposed organogram of the PIU in Quito is shown on next page. The Seven Zonal Offices will be reinforced according the needs and the pace of activities implementation. The average Project staffing at Zonal level will be composed of: a coordinator, one or two hydraulic engineers and agronomist, a social expert, an environmental expert, a specialist in procurement, another in financial and administrative management. The staff in the PIU Zonal Offices will be deployed progressively in accordance with the quantity of subprojects to be developed. The technical staff (financed by international credits by WB and AECID) will be hired: (i) at half-part time if the demand for subproject is ranging from 1 to 3 per *Zonal* and; (ii) at full-time when the demand will be exceeding 3 subprojects.

[26] Fomento a la producción agrícola a través de la implementación de sistemas de uso y aprovechamiento del recurso hídrico para el desarrollo rural y la soberanía alimentaria.
[27] Acuerdo Ministerial.

Proposed organogram of the Central Unit of the PIU in Quito



3. **Relationship with AECID.** AECID will provide a total co-financing of US$ 20 million to be split between components 1 and 3. A co-financing agreement will be signed with AECID in which the latter agrees to pay the Bank a fee for the supervision of their portion of the Project, using the Bank's procurement and safeguard rules as well as the Bank's financial management principles and procedures.

4. One specific risk could have been linked to the **timing of co-financing from the** AECID**.** Potential delays in the signing of the Cooperation Agreement between the two institutions could cause delays in the commencement of the implementation if each sub-project of Component 1 were co-financed by both financing agencies. It was decided to work on a parallel financing of these sub-projects (i.e., some sub-project will be funded 100 percent by World Bank, other 100 percent by the AECID) to eliminate this risk. In addition, the WB and AECID teams have coordinated closely the timing of the presentation of the Project to their respective approval entities in order to facilitate harmonized programming of implementation.

5. **Participation of PIU Decentralized Offices (Zonal).** Under supervision of the Central Unit of the PIU in Quito and after an intense process of fiduciary capacity building, the PIU zonal offices may be responsible of the procurement processes for individual and specific consultancies, small works and goods, when the PIU will determine that they are comparative advantages to procure locally (e.g. language-specific consultancy, extension services to be provided frequently, sub-projects under Sub-component 1.2).

6. **Sub-project cycle.** The sub-project cycle is described in details in Annex 2. The first steps of the sub-project cycle (from identification to preparation of sub-project profile) will be under the responsibility of the regional offices of MAGAP (either at Province or Zone levels). The sub-project profile will be prepared under close coordination with the water users association and/or the farmers' association and the Autonomous Provincial Government.

7. **Participation of GADPs and other stakeholders.** The MAGAP will establish, at provincial or lower level, formal Provincial Articulation Roundtables [28] with main institutional key players in rural development (GADPs, NGOs, other MAGAP's projects and programs, etc.). The Committees will be entitled to evaluate the sub-projects' profiles. Minutes of meetings will record all the comments, agreements and commitments. After approval of profile, the next stages of sub-project preparation (pre-feasibility, feasibility, design) will be procured by the PIU in Quito. The final technical studies (including economic, environmental and social dimensions) will need to be validated by the beneficiaries' organization and the Articulation Roundtables before the procurement of works.

8. **Specific institutional arrangement to ensure complementary financing by MAGAP programs**. As described in Component 2 (Annex 2), each Agricultural Development Plan designed by the Project will include technical assistance, training, and investments for the mid-term of productive, commercial, and market development aspects of subprojects. These activities will be financed by other MAGAP investment programs (*i.e. Hombro a Hombro, Buen Vivir Rural, Innovacion – PITPPA*). To ensure this complementary and synchronized financing, the Project cycle implies that representatives of MAGAP's units (i.e. Vice Ministry of Rural Development, Vice Ministry of Agriculture and Livestock, Sub-Secretariat of Commercialization, Coordination

[28] Mesas de Articulación Provincial.

Unit for Innovation), as well as representatives of their investment programs will participate in the Project's Provincial Articulation Roundtables and in Evaluation and Coordination Committees. This engagement will ensure: (i) that early in the process, MAGAP identifies the investment program/s that will complement Project investments; (ii) that upcoming complementary financing be timely planned and budgeted by the investment programs; and (iii) that each Agricultural Development Plan fulfills the requirements of the investment programs in order to facilitate their further financing. The complementary financing by one or more of its investment programs will be confirmed by MAGAP at the moment of approval of subprojects (see the Project Cycle, Annex 2). From that moment on, each investment program will follow its own operational procedure to materialize the financing of the Agricultural Development Plan, in agreement with producers and their organizations.

9. This specific institutional arrangement will be framed by an Intra-institutional Agreement or Ministerial Accord (*Acuerdo Ministerial*) to be executed during the first 6 months of implementation. The Ministerial Accord will require World Bank's no objection.

Financial Management

10. As part of the Project preparation, a Financial Management Assessment (FMA) was carried out to evaluate adequacy of financial management arrangements planned by MAGAP for the implementation of the Sustainable Family Farming Modernization Project. This section presents the design of financial management arrangements planned for the Project.

11. In accordance to proposed institutional arrangements, the Project will be implemented by the *Subsecretaría de Riego y Drenaje*, under the *Vice Ministerio de Desarrollo Rural* of the MAGAP, through establishment of a Project implementation unit with a status of *Decentralized Operational Entity (EOD)*[29] and in coordination with MAGAP regional offices (at Zone level). Within those arrangements, MAGAP will hire fully dedicated Finance professionals under the Central Unit of PIU and regional level, responsible for financial management tasks required under the Project and following UDAF guidelines[30].

12. Overall, MAGAP has gained experience implementing projects financed by the Inter-American Development Bank (IADB) and other local funding, through establishment of EODs, yet MAGAP has no recent experience implementing World Bank financed projects and will require to familiarize with some processes. In view proposed Project will increase MAGAP's volume of operations and demands, an EOD to be established, will be responsible for Project implementation. EOD's organizational structure, roles, responsibilities, process and procedures are being defined; nevertheless establishment of the EOD and its timely staffing with qualified and experienced professionals is essential to assure effective operation of the Project. Considering Project design encompasses several subprojects implemented at central and regional level (*Zonales*) of MAGAP, close coordination and standardized process and procedures have been designed not only for an adequate use of funds, but also to assure timely and reliable financial information on the Project. Moreover, as the Project have different financiers (WB, AECID, and local counterpart) standardize and harmonize financial management arrangements have been agreed. Based on the above mentioned aspects, the FM risk rating is rated as substantial.

[29] *Entidad Operativa Desconcentrada -Entity with administrative and financial autonomy to be established by MAGAP under a Ministerial Resolution.*
[30] *Unidad de Administración Financiera*

13. On the basis of the above mentioned, proposed financial management arrangements are considered acceptable to the Bank to implement the Project. Proposed FM and disbursements are being reflected in the Project Operational Manual.

14. **Organization and Staffing.** Financial management team at the PIU will include the same structure followed by other MAGAP' EODs. At the central level, this team will comprise: a Finance Chief, Budgeting Official, Accounting Official and Treasury Official –all to be hired under ToRs approved by the Bank-, expected to be hired with a combination of local and loans financing. At regional level, MAGAP will hire a financial administrative analyst, also under TORs approved by the Bank. The PIU FM team will be responsible for: (i) preparing annual Project budget, (ii) issue budgeting certification; (iii) carry out commitment of the contract amount; (iv) carry out the commitment process of the planned payments (contracts of central level) or wait for regional FM official to do the same for their contracts (regional level); (v) review supporting documentation and contracts control report, (vi) perform accrual accounting (recording and approval) and carry out all payments contracted at central or regional level, (vii) prepare withdrawal applications and SOEs; (viii) keep track of the timely disbursement of approved loan proceeds; (ix) consolidate information of payments by contracts of central and regional level; (xi) ensure all the original documentation of payments is adequately filed and maintained at the PIU; and (xii) coordinate auditing requirements. The regional FM official will be responsible for carrying out: (i) ex-ante control of documentation requiring payment; (ii) perform commitment budgetary process (recording & approval) accessing PIU budgetary records; (iii) ensure copies of documentation is adequately filed and maintained at the regional office; and (iv) facilitate any additional information required by PIU. Detailed roles and responsibilities are being reflected in the Operational Manual and TORs.

15. **Programming and Budgeting.** The Central Unit of PIU and Regional Offices will follow local procedures regulated by COPLAFIP[31], Ministry of Finance and MAGAP's UDAF, for the programming, formulation and execution of annual budgets.

16. Project's budget will be prepared and approved by the Central Unit of PIU and incorporated into the MAGAP's institutional budget and procurement plan. MAGAP's annual budget (including the Project) approved will be sent to the Ministry of Finance. Timely recording of approved budget, commitments, accruals and payments will be carried out through E-Sigef, which also allows identifying the financing source and main activity. Project annual program and budget as prepared by Central Unit of PIU's FM team will be used for monitoring purposes.

17. The programmatic budgeting structure of E-Sigef information system allows recording of Project transactions, classified by: i) financing source, component, subcomponent and type of expenditure (civil works, consulting studies, and goods). Therefore, budget execution reports issued from E-Sigef will be used for budget monitoring purposes and as the basis for the preparation of financial reports. A matrix with the budgeting structure to be used under the Project and linked to Project components, requires to be submitted and agreed with the Bank (TBC).

18. **Internal Control.** Local internal control framework is mainly based on the internal control standards issued by the *Contraloria General del Estado*. Under such requirement, MAGAP has established specific internal process and procedures for the review, approval, and payment of progress certificates of civil work contracts. Taking into account there will be activities carried out

[31] Código Orgánico de las Finanzas Públicas.

at central and regional level, these procedures will be adopted by the Project. For activities carried out al *central level*: (i) Central Unit of PIU technical team will act as contract administrator, will review progress certificates and reports from the supervisor (external) on the civil work advance; (ii) Central Unit of PIU's FM team will: a) ensure the payment is adequately supported to proceed with payments at central and regional level; b) set out budgeting account/s to be utilized under such payment; c) specify the percentage to be paid by financing source; d) proceed to record Project transactions in the financial management integrated system E-Sigef (commitment, and accrual); e) proceeds with payments; and f) assure all original supporting documentation remains at the Central Unit of PIU. For activities contracted at *regional level*: (i) Regional technical team will act as contract administrator, will review progress certificates and reports from the supervisor (external) on the civil work advance; (ii) Regional FM professional will: a) ensure the payment is adequately supported (ex-ante control); b) will carry out the commitment process; c) specify the percentage to be paid by financing source (through contract report); d) request Central Unit of PIU's FM team to proceed with accrual process; e) assure Central Unit of PIU's FM team proceeds with payments; and f) maintain copy of core supporting documentation of payments processed in the Central Unit of PIU). These process and procedures have been discussed with MAGAP and it is expected detailed process and procedures designed for the Project will be reflected in the Project operational manual.

19. Subprojects under component 1 will have beneficiary in-kind (manpower) contribution of 10% out of the civil work contract the total amount. In accordance with administrative and operational mechanisms discussed with MAGAP, each design study will determine the scope of in-kind contributions. MAGAP plans to have a subproject agreement signed with beneficiaries' representative in which in-kind contribution will be reflected. External supervisor will review in-kind contribution work performed and include this item as part of progress certificate and its report. EOD or Regional FM team will record this amount in each subproject report and finally this amount will be recorded as part of Project financial statements.

20. **Accounting and Information System.** Central Unit of PIU and Regional Offices have to follow FM regulatory framework mandated by the Ministry of Finance. All processes and transactions will be recorded (including projects/programs) in the financial management accounting system E-Sigef, using the accrual accounting basis and on the basis of the chart of accounts for public sector. Under those arrangements Project transactions will be recorded and accounted for as part of MAGAP's general accounting. E-Sigef and will be complemented by Excel spread sheet or other data report, to provide detailed information by subproject, financing source, and contract and Regional Office.

21. **Financial reporting.** Considering all payments will be managed directly by central level, the Central Unit of PIU will be main responsible for preparing Project financial reporting, including: semi-annual and annual financial reports.

22. Project financial reporting will include: (i) sources and uses of funds, specifying funds received by financing source (IBRD, AECID, counterpart funding from MAGAP and beneficiaries), and classify expenditures by disbursement category, and cash balances; (ii) cumulative investments by Project component and subcomponent; (iii) Designated Account (DA) account reconciliation; (iv) consolidated subproject report (for Subcomponent 1.1 and 1.2); and (vi) budgeting report of the whole Project.

23. *Project-Interim financial reports* will be prepared by the PIU. These reports will be

submitted to the Bank on a semi-annual basis, but no later than 45 days after the end of each calendar semester.

24. *Annual financial statements* for the Project, including: (i) and (ii), with the content and format described above, would be prepared by MAGAP to be audited, as specified below.

25. The final form of the Project financial statements and complementary reports were reviewed and agreed with the Bank and AECID.

Audit Arrangements.

26. *Internal Audit*. MAGAP's internal audit unit reviews compliance of operations and procedures with Ministry of Finance Law and internal manuals. Internal auditor submits internal audit reports to the Ministry of Finance, *Contraloría General del Estado* (CGE) and MAGAP. Internal auditors may include Project activities in their annual work plan and will provide information to external auditors.

27. *External Audit.* Specific harmonized arrangements include: (i) follow the MOU[32], where the CGE is responsible for selection and appointment of an acceptable, independent private auditor for the Project; (ii) use of standardize audit terms of reference form –to be prepared by MAGAP- and approved by both entities; (iii) follow same single list of acceptable audit firms for the WB; and (iv) request single audit report.

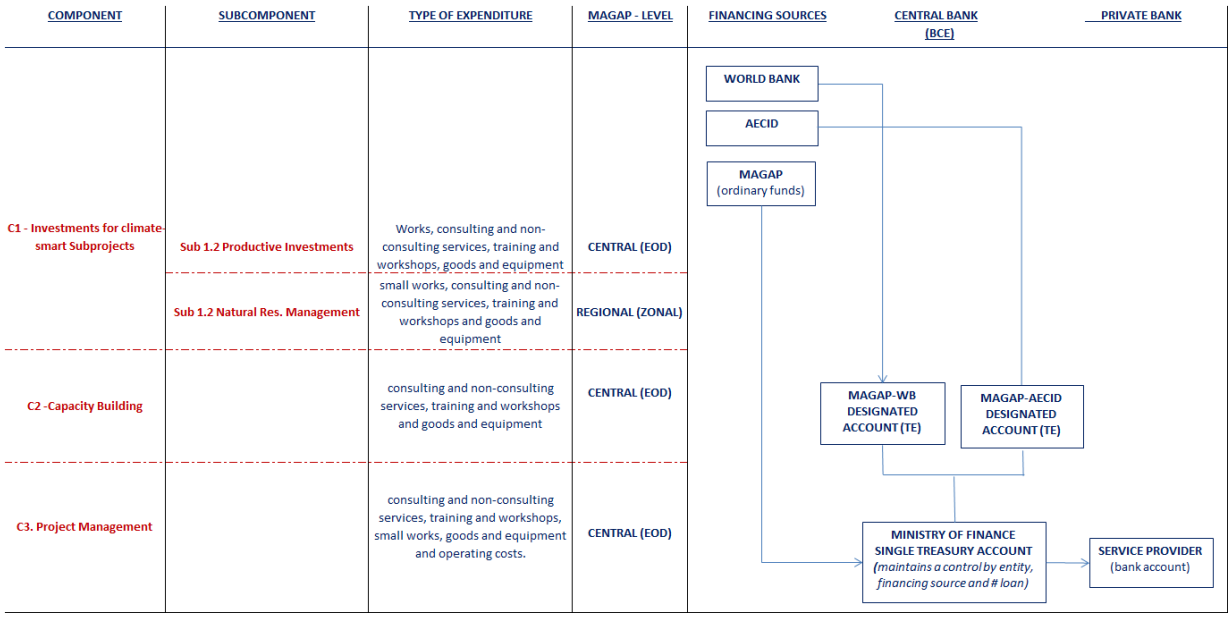
28. Annual Project financial statements will include:

Opinion	Period	Due date
1) Project financial statements 2) Management Letter	Fiscal year of the country or any other period agreed with the Bank	not later than six months after the end of each period audited

29. WB requires audit of annual Project financial statements be conducted in accordance with International Standards on Auditing (ISAs) issued by the International Federation of Accountants (IFAC). Audit costs will be financed with loan proceeds; however the terms of reference need to be sent for the Bank's no objection not later than *four months after WB effectiveness date*. MAGAP will confirm the appointment of the auditor for the first three years of Project implementation no later than six (6) months as of the Effective Date which will help to avoid delays in audit contracting. In accordance with WB Access to information policy, the audited financial statements of the Project will be made publicly available.

30. *Funds Flow and Disbursement Arrangements – MAGAP*. The diagram below shows the funds flow arrangements for the Project:

[32] *Memorandum of Understanding (MOU), signed in 2007 between the CGR and the Bank.*



31. *Funds Flow*. In accordance with local regulations, MAGAP through the Central Unit of PIU will have to open separate bank accounts, one for each financing source, in the Central Bank of Ecuador[33], where funds will be deposited by each financier and from which funds can be withdrawn on a periodic basis, against each payment request. Under such framework, a Designated Account (DA) will be opened at the Central Bank to receive WB loan proceeds. Similarly another exclusive bank account will be opened by MAGAP at the Central Bank to receive AECID financing. It has been agreed AECID will finance different subprojects under Component 1 (only on Zone 1 and 3) and different expenditures under Component 3 (operational costs including staffing for the Project unit teams in Zone 1 and 3), both on the basis of a parallel financing.

32. *Local counterpart financing includes MAGAP and beneficiaries.* MAGAP contribution will cover permanent fully dedicated professionals at Central Unit of PIU and Regional Offices. Beneficiaries' counterpart is estimated minimum on 10 percent of the civil work contract of investments, under Component 1. Thus, considering a portion of subprojects' financing will have in-kind contribution, then a jointly financing will be applied.

33. Regarding value added tax's financing, both financiers WB and AECID are able to finance it; however, MAGAP has decided to finance it (IVA) directly.

34. In accordance with local requirements, funds deposited in the DA will be withdrawn to the Treasury Single Account (TSA), immediately once deposited by each financer. WB, AECID and local counterpart financing will be available at TSA, where funds will be clearly identified by Project, financier *(organism)* and financing source-loan # *(correlativo)*.

152. During the first year of implementation, all Project activities will be handle from the Central Unit of PIU. As agreed in the last mission, only activities which amount exceed US$100,000 will be carried out at regional level by Zonales. Regardless contracting process is carried out at central or regional level, all payments of Project activities will be carried out by the

[33] *In accordance with local requirements, Central Bank requests specific bank account is opened by each financer in order to receive funding.*

PIU. All payments will follow TSA mechanism and the Interbank Payment System (SPI) of the BCE, which allows for electronic cash transfers to deposit on beneficiaries' private bank accounts. Detailed funds flow arrangements will have to be reflected in the Operational Manual.

35. *Disbursements*: As in other projects, the Bank will disburse loan proceeds using the disbursement methods of advance, reimbursement and direct payment. Under the advance method, a segregated Designated Account (DA) in US Dollars will be opened and maintained by MAGAP in the BCE[34]. Funds deposited into the DA as advances, will follow Bank's disbursement policies and procedures as described in the Disbursement Letter.

36. The Project involves implementation of subprojects, all to be implemented by MAGAP and regional offices, therefore it is not expected transfer or advance of funds to beneficiaries. Preparation of withdrawal applications will be responsibility of the PIU. Disbursements will be based on SOEs, prepared on the basis of budgeting reports (*cedulas presupuestarias*) issued from the e-Sigef. Budgeting reports -issued from E-Sigef- are monthly and generally include a column of payments carried out by each component, and financing source. The Central Unit of PIU will produce complementary information by contracts and subprojects in Excel or other data application to prepare SOE, as required.

37. Advances may be made to the DA as long as the aggregate amount advanced does not exceed the ceiling of US$5,000,000. This calculation took into account the planned expenditures for the Project. It's likely the Project will request an initial advance of US$1,500,000 or US$2,000,000 and according to Project execution and resources needed, new advances will be requested until completing the ceiling of US$5,000,000 Disbursement reporting is not yet defined. The frequency of reporting eligible expenditures paid from the Designated Account, as well as supporting documentation required has been established in the Disbursement Letter.

38. All supporting documentation of the Project (original records evidencing eligible expenditures, receipts and supplier invoices, etc.) will remain at the central unit of the PIU. Supporting documentation of expenditures carried out at regional level will remain there and copies of the payment will be sent to the PIU for ex-post reviews from the Bank and external auditors.

39. Retroactive financing is not included in this Project.

[34] *In accordance with local regulations, MAGAP has to open separate special accounts in the Central Bank of Ecuador to manage public resources including those coming from external financing.*

40. Loan proceeds would be disbursed against the following expenditure categories:

Table of Loan Proceeds (expressed in US$)		
Category	**Preliminary Amount of the Loan Allocated**	**Percent Expenditures to be financed (excluding taxes and in kind contributions)**
(1) Goods, Works, Non-consulting services and consultant's services required for Climate-Smart Subprojects under Part 1 of the Project	67,700,000	100%
(2) Goods, non-consulting services, consultant's services, and Training required under Part 2 of the Project	5,600,000	100%
(3) Small works, goods, non-consulting services, consultants' services, Operating Costs and Training under Part 3 of the Project	6,700,000	100%
TOTAL AMOUNT	**80,000,000**	

** 100% of each contract, without considering beneficiary in-kind contribution under subprojects (10% out of civil work contract)*
*** Balance to be allocated to disbursement categories during Project implementation.*

Procurement

41. Procurement activities will be carried out by the MAGAP through the Central Unit of PIU and the Zonal offices. As part of Project preparation, an assessment of the procurement capacity of the implementing agency was carried out by the Project Team in august and November 2014 and January, February and March 2015 it was agreed to implement the Central Unit of the PIU and ZO with adequate: (i) organizational structure, (ii) facilities and support capacity, (iii) qualifications and experience of the staff that will work in procurement, (iv) record-keeping and filing systems, (v) procurement planning and monitoring/control systems used, and (vi) capacity to meet the Bank's procurement contract reporting requirements.

42. For the procurement activities the PIU and ZO will be staffed with dedicated procurement specialist, and the dedicated procurement specialist at each zonal office[35] supported by the MAPAG PIU technical and administrative staff. Procurement risks are related to the procurement capacity of the MAPAG, as the technical and fiduciary teams do not have adequate knowledge of Bank procurement procedures and contract. Based on the information available, the procurement risk is deemed Substantial.

43. Procurement risks are related to the upcoming creation of the PIU and the procurement capacity of the institution is considered weak, as the technical and fiduciary teams do not have experience with Bank procurement procedures and contract monitoring.

44. Additional risks include Poor quality of works and delays in completion of works due to

[35] Seven (7) zonal offices.

(i) contractors winning at significantly lower prices than engineer's estimates and (ii) inadequate management of large contracts due to lack of proper experience from the MAPAG side. Mitigating measures include:; a) Frequent monitoring (at least monthly for each contract) on quality assurance and physical progress, World Bank consultants and Project Support Consultants, based on the annual monitoring plan; b) the PIU, with the support of the World Bank, will verify all justifications for any variation in price before executing the works; and c) Gearing up in the PIU through the contract Managers to acquire proper contract management skills to face a large quantity of contracts.

45. The suggested corrective measures that were agreed upon are: (i) a Project Operational Manual including, inter alia, procurement and contracting procedures, which will be adopted as a condition of negotiation of the Loan Agreement; (ii) the Loan Agreement will include additional provisions related to Project Implementation under the Procurement point of view; (iii) the Bank's work in Ecuador includes a systematic training program on procurement for the existing and new lending operations, also close monitoring by the IBRD[36], particularly, during the first two years of Project implementation, and (iv) MAGAP is promoting the investment of the industry in Ecuador for the irrigation systems pipeline and accessories in order to ensure the supply chain.

46. Procurement for the proposed Project will be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans, IDA Credits and Grants by World Bank Borrowers", and "Guidelines: Selection and Employment of Consultants under IBRD Loans, IDA Credits and Grants by World Bank Borrowers", both dated January 2011 and July 2014, and the provisions stipulated in the Legal Agreement. For each contract to be financed by the Credit, the different procurement methods or consultant selection methods, estimated costs, prior review requirements, and timeframe, are agreed between the Recipient and the Bank in the Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual Project implementation needs and improvements in institutional capacity.

47. **Procurement of Works.** Works procured under this Project may include the construction of irrigation systems, small reservoirs and other related small civil works infrastructure etc. No packages of International Competitive Bidding (ICB) are foreseen. Also packages amounting to under US$8,000,000 in the aggregate may be procured using National Competitive Bidding (NCB) processes. Shopping (S) procedures may be used for contracts of up to US$200,000 (only in emergency cases). Procurement of works for NCB or Shopping methods would be based on bidding documents satisfactory to the Bank.

48. **Procurement of Goods and Non Consultant services**. Goods procured under this Project would include, inter alia: civil construction and irrigation goods (pipelines, pumps, and accessories) necessary to carry out the Project activities and goods (vehicles, equipment, furniture, materials, etc.) purchased for the implementation of each component. Procurement of goods will be done using the Bank's standard bidding documents (SBD) for all international competitive bidding (ICB), and bidding documents satisfactory to the Bank for national competitive bidding (NCB) or Shopping methods.

49. All procurement notices shall be advertised on the Project's website, the MAGAP website, and at least one local newspaper of wide national circulation. ICB notices and contract award information shall be advertised in the United Nations Development Business online (UNDB

[36] At least quarterly missions in the first two years.

online), in accordance with provisions of paragraph 2.60 of the Procurement Guidelines.

50. **Selection of Consultants.** Consulting firm services may be contracted for supervision (*Fiscalización*), audits and evaluations. The procurement of consulting firms will be carried out using Bank standard Request for Proposals (RFP) documents. International firms should have the opportunity to participate in all solicitations above US$200,000. Shortlists of consultants for services estimated to cost less than US$200,000 equivalent per contract may be composed entirely of national consultants (firms registered or incorporated in the country) in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. Consulting firms would be selected following Quality and Cost-based Selection (QCBS) for all contracts in the estimated amount of more than US$200,000.

51. **Selection of Individual Consultant Services.** Individual consultant services will be contracted mostly for Project management and for technical advice, mainly in the substantive matters of the Project, but also for design, supervision (Fiscalización) and technical assistance. The terms of reference (ToRs), job descriptions, minimum qualifications, terms of employment, selection procedures and the extent of Bank review of these procedures to contract and documents shall be described in the Operational Manual and the contract shall be included in the Procurement Plan.

52. **A Project website, a MAGAP's website, and a national newspaper** shall be used to advertise expressions of interest as the basis for developing short lists of consulting firms and individual consultants, and to publish information on awarded contracts in accordance with the provisions of paragraph 2.31 of the Consultants' Guidelines and as mandated by local legislation. Contracts expected to cost more than US$300,000 shall be advertised in UNDB online.

53. **Training.** Training would include expenditures (other than those for consultants' services) incurred by the Borrower to finance logistics for workshops, meetings and seminars as well as reasonable transportation costs and per diem of trainees and trainers (if applicable), training registration fees, and rental of training facilities and equipment. Procurement would be done using NCB and shopping procedures as discussed below. Direct Contracting (paragraph 3.8 of the Procurement Guidelines) may be used for the payment of registration fees, up to a ceiling amount to be established annually in the Procurement Plan.

54. **Operating Costs**. The Project will finance incremental operational costs of implementing institutions and the operational costs of the PIU, including salaries, travel costs and subsistence for missions of Project staff (excluding civil servants); establishment and operation of the monitoring and supervision, technical and financial audits; operation and maintenance of Project offices, including utilities and telecommunication; acquisition, operation and maintenance of office and field equipment, including vehicles, needed for Project activities. These operating costs will be administered in accordance with the Bank's Procurement Guidelines, as appropriate. Procurement also will be carried out using the Bank's SBD or National SBD agreed with the Bank.

55. **Operational Manual (OM)**. The OM will include all procedures, rules, and standards for the implementation of all aspects of the Project including, but not limited to: institutional arrangements; operation of the Project coordination team; Project planning, monitoring & evaluation; social and environmental management, reporting, communication, human resources; procurement; administrative and financial management; and procedures for amending the OM.

56. **Procurement Plan (PP).** A procurement plan covering the first 18 months of Project implementation has been discussed and agreed upon by the Borrower and the Project Team (including the AECID) during Project appraisal. The final version of the procurement Plan was prepared on March 25, 2015. The PP activities will consider the special nature or the Project, Community Demand Driven. It will also be available in the Project's database and in the Bank's external website. The Procurement Plan will be updated semi-annually or as required to reflect the actual Project implementation needs and improvements in institutional capacity. The Procurement Plan shall set forth those contracts which shall be subject to the Bank's Prior Review. All other contracts shall be subject to post review by the Bank, except for those contracts terminated by the recipient's agency for which the Borrower shall seek the Bank's no objection prior to the proposed termination.

57. **Frequency of Procurement Implementation Support.** In addition to prior review implementation support missions to be carried out by the Bank, the capacity assessment has recommended semi-annual missions[37], including field visits including the contract implementation and monitoring, and post reviews of procurement actions. Those contracts subject to post review will be reviewed by the Bank and, based on the findings of these reviews and the proposed ratings, the Bank may determine the revision of the prior review requirements.

58. Thresholds for procurement methods and prior review are as follows:

Expenditure Category	Contract Value (Threshold) (US$ thousands)	Procurement Method	Bank Prior Review
1. Works	> 8,000	ICB	All
	200 – 8,000	NCB	First two each year
	< 200	Shopping (Price Comparison) (only in case of emergency)	First two each year
	Regardless of value	DC	All
2. Goods	> 500	ICB	All
	100 – 500	NCB	First two each year
	< 100	Shopping	First two each year
	Regardless of value	DC	All
3. Consultant Services	> 200	QCBS	All
	< 200	QCBS, QBS, CQ, FBS, LCS (as per Procurement Plan)	All ToRs Selection Process reviewed twice yearly (Ex Post)
	Regardless of value	SSS	All
4. Individual Consultants	> 100	IC	All
	< 100	IC	All TOR. Selection Process reviewed twice yearly (Ex Post). All contracts awarded under SSS, and key personnel
	Regardless of value	SSS	All

[37] At least quarterly missions in the first two years.

Environmental and Social (including safeguards)

59. **Social aspect.** The Project will benefit a large number of small and medium size farmers in the highlands and coast of Ecuador. A significant number of those families benefited by the Project are expected to be from indigenous communities in the highlands as well as from afro-Ecuadorian communities in the coast. For this reason the Indigenous Peoples safeguard policy (OP/BP 4.10) has been triggered. Because the Project is demand driven, it is not possible to learn before appraisal neither the precise locations for Project intervention nor the number of beneficiaries coming from indigenous or afro-Ecuadorian communities.

60. Land use for Project implementation is expected to be mostly in the family farm for the benefit of the small and medium size producer; however there is a likelihood that in some instances land might be used involuntarily for laying out pipes or other minor infrastructure required for the irrigation systems. Thus there is a chance that rights of way, of small areas of land may be needed; no physical or economic displacement is expected. For these reasons OP/BP 4.12 Involuntary Resettlement policy has been triggered. Project areas have not been determined before appraisal because this is a demand driven Project.

61. The main local organizations that will be actively involved in Project implementation are the *Juntas de Regantes*, these are legally recognized and are nationally grouped in the *Juntas Administradoras de Agua Potable y Riego* (JAAPRE).

62. In order to improve Project implementation and to comply with the Bank's safeguard policies MAGAP has prepared an Environmental and Social Management Framework (ESMF), an Indigenous Peoples Planning Framework (IPPF) and a Resettlement Policy Framework (RPF). The IPPF will guide Project activities whenever indigenous families and afro-Ecuadorians are involved and will help in organizing an adequate communication strategy to ensure Indigenous Peoples participation in Project benefits. During the first phase of Project implementation, the social specialist from the Central unit of the PIU, with support from the task team social specialist, will design a methodology for the implementation of OP 4.10 in regard to the preparation of Indigenous Peoples Plans (IPPs). Because this Project will finance a large number of sub projects, it is virtually impossible to prepare IPPs for each sub Project. Instead, the preparation of IPPs will be done through grouping together sub projects by region and ethnicity. It is worth mentioning that the IPPs will do not add more than what the Project is already financing because the Project has no adverse impacts, but will ensure that the provisions of the policy are fully included and documented. The RPF will provide guidance in regard to rights of way, land acquisition and compensations in case Project activities affect crops due to minor civil works. The Environmental and Social Management Framework (ESMF) as well as the IPPF include a gender approach to reinforce women's role and enhance women's participation in Project activities, and to ensure women's participation in the decision making process.

63. The Project is not expected to have adverse social impacts; it would rather improve family livelihoods and income generation while at the same time make a more efficient use of natural resources, in particular water resources. The most important social risk the Project faces is the exclusion of the so called *posesionarios*, farmers who have not formalized their land tenure. Details of the analysis of land tenure issues are presented in Annex 8.

64. In order to promote Project inclusion of indigenous families and afro-Ecuadorians it has

been agreed that the Project will hire local social promoters as it was done in the Chimborazo (PIDD) Project with great success.

65. In the Pre-investment stage the Project will include a **gender focus** in the studies and an understanding of how Project intervention would affect women roles. During Project implementation local promoters will be trained on gender approaches and local women will be hired as local promoters. During monitoring and evaluation, MAGAP will include specific indicators to address gender issues. The national legislation includes several obligations in regard to women' rights in connection to water resources and development projects.

66. The implementing agency's capacity for managing social and environmental safeguards aspects of the project will consist of at least one professional responsible for environmental safeguards and one for social in the Central Unit in Quito and each of the seven Zonal offices will include social promoters and environmental experts as long as the portfolio of subprojects and pace of implementation requires it.

67. **Environmental aspects**. The proposed Project is expected to generate overall positive environmental and social impacts given its objective to increase agricultural revenues and resilience of Ecuador's family farming sector by promoting on farm investments geared toward a more efficient use of natural resources. The focus will be on efficient water use, increased adaptation to climate change, improved productivity and market access, overall contributing to an increased competitiveness and sustainability of agricultural production systems. A Greenhouse Gas Accounting Assessment for this Project will be prepared with the use of the Ex-Ante Carbon-balance Tool (EX-ACT), in order to estimate the Project's net carbon-balance. The Project may involve investments in productive activities and construction or rehabilitation of small irrigation infrastructure but these are expected to have limited environmental impacts mostly during construction.

68. However, since subproject sites are not yet selected, some could be located close to important critical natural habitats within high priority ecosystems in Ecuador (such as *páramos*) and human activity in the buffer zones induced by the Project could indirectly impact natural habitats. So, the Project activities will promote environmentally sound agricultural practices in areas, which may include innovative ideas to protect environmentally sensitive habitats. But the Project will not finance any activity that could potentially cause significant conversion or degradation of natural habitats. Also, the intensification of agriculture through irrigation and potential change in production systems may involve pest management and the use of agro-chemicals in subproject activities so the Project will support building capacity among Project staff and farmers on the rationale use and responsible management of pesticides. Overall, the Project is expected to have positive environmental impacts through a better management of irrigation systems and more efficient water use. No significant or irreversible impacts are foreseen as a result of Project activities.

69. The safeguard policies on Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Pest Management (OP 4.09), and Physical Cultural Resources (OP/BP 4.11) have been triggered. As specific sites and exact activities are not known at this stage, an environmental and social management framework (ESMF) has been prepared to screen, assess, and mitigate environmental impacts related to proposed subprojects that may involve investments in productive activities and construction or rehabilitation of small irrigation infrastructure.

70. The ESMF outlines the process to prepare the necessary environmental and social

safeguards instruments for each investment activity that may be required to mitigate and manage potential environmental impacts. The ESMF also provides specific guidelines to avoid or minimize risks and manage potential environmental impacts both prior to and during on-the-ground activities. Any subprojects considered as Category A will not be eligible for funding by the Project. The ESMF outlines the procedures and mechanisms for screening out activities that may cause significant degradation or conversion of natural habitats. Monitoring activities are established during implementation to ensure that critical natural habitats are not adversely affected. The ESMF also includes screening procedures for pest management and pesticide use. The Pest Management Plan will build capacity among Project staff and raise awareness among farmers on the rationale use and responsible management of pesticides and agrochemicals in general. Given the uncertainty regarding the exact locations of activities to be carried out under the Project, the ESMF includes specific provisions to assess, prevent or mitigate potential impacts on forests, sacred valleys or landscapes considered to have historical or cultural significance prior to any activities being undertaken on the ground as well as provisions for the handling of physical cultural resources that may be discovered during Project implementation (chance-finds). The ESMF also describes the Project's complaints mechanism and contains monitoring provisions.

71. The ESMF, RPF and IPPF were publicly consulted on March 11, 2015 and disclosed to the public both in country at www.agricultura.gob.ec and at the World Bank's external website respectively on May 21, May 9 and May 13, 2015. All documents were disclosed in a revised version on May 31, 2015, to reflect modifications on the Project's name in Spanish, wanted by the implementing agency.

Monitoring & Evaluation

72. Component 3 will support the activities of Monitoring & Evaluation of the Project. An M&E specialist will be hired on a full-time basis during the first three months of implementation and will be part of the PIU team. He will develop a specific M&E system to support the implementation of Project. This specialist will work in close coordination with the staff in charge of M&E within the headquarters of MAGAP in Quito for the ministry in general and/or for other projects (Hombro a Hombro, Buen Vivir, etc.). The M&E specialist in the PIU will have counterparts in the regional (zonal) MAGAP offices. The M&E system will collect data to measure Project results and outcomes.

73. Under Component 3, the PIU will be responsible for hiring/commissioning and supervising the following tasks: (a) Project baseline (to be completed by May 31, 2015); (b) technical and other studies needed to understand Project performance and its comparison with other similar initiatives; (c) Mid-Term Review; (d) final independent impact evaluation and (e) the preparation of Project reports.

74. A Beneficiary Monitoring System (BMS) will be developed as a simple, effective and participatory instrument to monitor Project progress with all relevant stakeholders (beneficiaries, technicians of co-implementing agencies, and others). Two intermediate-level Result Indicators reflects citizen engagement (i. e., Sub-projects with post-Project community engagement or O&M arrangements, in number and in percentage).

Role of Partners (if applicable)

75. The Spanish Agency for International Development Cooperation (AECID) will provide a total co-financing of US$ 20 million to be split between components 1 and 3(Provinces of

Esmeraldas, Carchi, Imbabura and Sucumbios) and Zone 3 (Provinces of Pastaza, Cotopaxi, Tungurahua and Chimborazo). A co-financing agreement will be signed with AECID in which the latter agrees to pay the Bank a fee for the supervision of their portion of the Project, using the Bank's procurement and safeguard rules as well as the Bank's financial management principles and procedures.

76. FAO will provide an irrigation specialist and an agricultural economist during Project supervision through the Agreement between the World Bank and the FAO Investment Center. The FAO will provide expertise to train the technical staff of the MAGAP and the PIU on the same model applied for the PIDD Project.

Annex 4: Implementation Support Plan

ECUADOR: Sustainable Family Farming Modernization Project

Strategy and Approach for Implementation Support

1. The 2008 Constitution of the Republic of Ecuador defined the decentralization framework recognizing the political, administrative, and financial autonomy of the Decentralized Provincial Autonomous Governments (GADPs) at their different levels (canton, province, and parish). Within the competences of Provincial Governments under the current Constitution are: (i) planning, building and maintaining the road system at provincial level; (ii) planning, constructing, operating and maintaining irrigation systems and; (iii) promoting agricultural activity. Therefore, the implementation of new development projects and the sustainable operation of existing irrigation projects are limited by the level of capacity for Project preparation, implementation and financing by the Provincial Governments.

2. As the Project is inserted in a broader MAGAP program which has started in early 2015, the MAGAP will be able to screen and pre-select a list of sub-projects. During 2015 and before the commencement of the Project implementation, the MAGAP will consolidate the first pipeline of sub-projects and prepare the studies. The insertion on a broader program is an opportunity for the WB/AECID Project to have a quicker pace of implementation during the first year than a normal CDD or framework Project.

3. For the implementation Agency (MAGAP), the second half of 2015 should be also dedicated to: (i) formally create the PIU as a Decentralized Operational Entity (EOD) by a Ministerial Accord; (ii) hire the PIU staff and reinforce the zonal and provincial MAGAP offices according needs; (iii) Mobilize and/or create the Articulation Roundtables (*Mesas de Articulación*); and (iv) Mobilize the partnerships with other MAGAP's projects and programs.

4. If the above mentioned activities are concluded, the WB and AECID will be in a position to focus activities right at the commencement of Project implementation: (i) assess technical quality and compliance of selection process for the first pipeline of sub-projects prepared by MAGAP; (ii) Train PIU in Central Unit and staff from zonal offices of MAGAP in fiduciary, safeguards and technical aspects, according needs; (iii) support the PIU to build the M&E system, including hiring consultancy for the baseline survey.

Implementation Support Plan

Time	*Focus*	*Skills Needed*	*Resource Estimate*	*Partner Role*
First six months	Assess quality of the first set of sub-projects preselected and feasibility studies prepared by MAGAP	Irrigation, social, environmental specialists and economist	WB Budget+ Human Resources from FAO-CP	FAO provides an irrigation specialist and support from an agricultural economist
	Provide support to strengthen the sub-Project cycle for identification to construction, ensuring effective participation of beneficiaries and stakeholders (GADPs)	Irrigation, social, environmental specialists and agricultural economist	WB + FAO-CP	FAO provides an irrigation specialist and support from an agricultural economist (participatory methodology)
	Strengthen PIU and MAGAP capacities	FM, procurement, safeguards specialists	WB	AECID provides support and templates for their needs of reporting
	Analysis of the 30 first feasibility studies that will provide data to build the baseline	Economist	WB + FAO-CP	FAO provides an economist
	Support the PIU to build the M&E system, including hiring consultancy for the baseline survey	M&E Specialist	WB + Hiring of consultancy services for baseline survey	
6-12 months	Strong support for the first procurement of consultancy (studies and extension services for elaboration of business, goods and works (for the first pipeline of sub-projects)	Fiduciary, Irrigation, social, environmental specialists	WB + FAO-CP Organization of National (Chimborazo) and Regional (Peru) study tours	FAO provides an irrigation specialist for training
12-24 months	Field survey to assess quality and first impacts of the first pipeline of sub-projects	All the task team	WB + FAO-CP	FAO provides an irrigation specialist and support from an agricultural economist AECID participates actively of this assessment

Time	*Focus*	*Skills Needed*	*Resource Estimate*	*Partner Role*
	Revision of sub-projects cycle, technical design according results of assessment	All the task team	WB + FAO-CP	FAO provides an irrigation specialist and support from an agricultural economist AECID participates actively of this process of revision
24-48 months	Project Supervision through 2 or 3 annual supervision missions	All the task team	WB + FAO-CP	FAO provides an irrigation specialist AECID participates at least once a year at supervision missions
	Mid-Term Review and Intermediate Impact Evaluation	All the task team	WB + FAO-CP Hiring of consultancy services for MTR evaluation	FAO provides an irrigation specialist AECID participates of MTR mission
48-60 months	Preparation of the last set of sub-projects (one year before closing) to allow construction and	All the task team	WB + FAO-CP	FAO provides an irrigation specialist
	Final Impact Evaluation and Preparation of Closing (workshops, production of video and folders, borrower's report, ICR)	All the task team	WB + FAO-CP Hiring of consultancy services for final impact evaluation	FAO provides an irrigation specialist and an agricultural economist AECID participates of Project closing.

Skills Mix Required

5. The skills required and the inputs from the Task team has been evaluated for the whole Project (including WB and AECID co-financing) according the below table.

Staffing	**Estimated SWs for the 5 years**		***Number of Trips***
	Staff-Week (field)	**Staff-Week (office)**	
Task Team Leader	15	60	15
Irrigation specialist	20	30	20
Irrigation specialist	20	30	20
Agricultural Economist	20	30	20

Staffing	Estimated SWs for the 5 years		*Number of Trips*
	Staff-Week (field)	**Staff-Week (office)**	
WR resources specialist	15	30	15
Environmental Specialist	15	30	15
Safeguards specialist	15	30	15
Social expert	15	30	15
Financial Management Specialist	15	60	15
Procurement Specialist	15	60	15
Total	**165**	**390**	**165**

Partners

Role	***Institution/Country***
To be determined	AECID / Spain

Resource requirements

6. The Project will have a better quality of supervision with a permanent staff in Quito to perform day-to-day supervision and contact with client. This permanent staff could be financed with Bank Budget and part of the fees paid by AECID under the co-financing agreement.

Annex 5: Economic and Financial Analysis

ECUADOR: Sustainable Family Farming Modernization Project

1. The major impact of the proposed Project would be an increase of beneficiaries' annual agricultural production value and of agricultural revenues generated by investments on irrigation infrastructure rehabilitation, on-farm irrigation technology improvement; water storage subprojects and the related activities of training and technical assistance. The Sub-Secretariat for Irrigation of the Ministry of Agriculture conducted a feasibility study of a national irrigation program for small and medium-scale family farming. The Project funded by the WB is conceived as an integral part of this program. The financial and economic analysis of the national program is based on: a data base of potential subprojects for improved irrigation technology and water harvesting which represent a total investment of USD 205 million; likely improvements on production and productivity of 14 representative crops, as a result of greater water availability due to irrigation improvements; an evaluation period of 10 years and an annual real discount rate or Opportunity Cost of Capital (OCC) of 12 percent. A revised version of the economic analysis of the national program results in an Economic Internal Rate of Return (EIRR) of 20 percent. The most important representative crops are: cocoa, maize, rice, potatoes, pastures, coffee, banana and vegetables.

2. The ICR for the Chimborazo Productive Development Investment Project (PIDD) is under review. The Economic Internal Rate of Return (EIRR) estimated at appraisal of likely irrigation subprojects ranged from 2 to 58 percent, with an average of 40 percent. For the ICR, the average EIRR of 55 investment subprojects was 29 percent. This EIRR estimation was based on the potential marginal productivity increase as a result of the water availability increase, since water distribution efficiency increased by 53 percent. Irrigation investments funded by PIDD were essentially off-farm community-collective irrigation infrastructure improvements. Annual agricultural production value increased by 33 percent (from USD 880 to USD1,177 per average beneficiary family) within the 1-2 years of operation.

3. To provide complementary field evidence, a review was conducted of ex-ante feasibility assessments of rural investment subprojects, with sizable irrigation technology components, recently funded by other development programs of the Ministry of Agriculture. Based on this review, 16 subprojects were selected from various provinces, namely: Azuay, Chimborazo, Carchi, Loja, Los Rios, Manabí and Santa Elena. The selected subprojects support integral agricultural development. Around 50 percent of their total investment costs consist of improved on-farm irrigation technology – major investment category foreseen for the Project. In line with ex-ante analysis of national irrigation program, the basic assumptions were: an evaluation period of 10 years; an annual real discount rate or OCC of 12 percent; and income tax of 25 percent; a Conversion Factor (CF) of 0.89 for investment and input costs, as a results of the Value Added Tax (VAT) of 12 percent; and no difference between financial and economic prices for labor to reflect current scarcity of labor availability in rural areas.

4. **Financial Analysis.** Based on estimates for the 5th year of operation, the average annual production value increases by USD 2,050/Family or USD 3,110/Ha (157 percent of without project situation). In turn, the average annual financial net income increases by USD 930/Family or USD 1,420/Ha (2.8 fold increase). The Financial Internal Rate of Return

(FIRR) of the nine most promising subprojects ranged: from 10 to 38 percent with an average of 26 percent, when the economic life of irrigation investments was assumed to be 5 years; and from 16 to 40 percent with an average of 31 percent, when such an economic life was 10 years. In line with above-mentioned review, the Project can be very sensitive to the subproject screening process. **If such a screening process is effective in selecting projects with FIRR above the OCC, the expected FIRR can be around 26 percent (in line with most promising PBVR subprojects) and the FNPV for a total investment on subprojects of USD 100.5 million would be USD 68 million.** If the screening process is not as effective, the average FIRR can be around 12 percent with 5 years of economic life of irrigation investments, and 16 percent with 10 years of economic life of irrigation investments (average situation of the 16 PBVR subprojects analyzed). As stated in section on risks, the Project must implement and monitor clear procedures for subproject identification, screening and preparation to avoid inefficient investments. To emulate the risk of reduced water availability, the production value or gross income with project was reduced by 20 percent. With such income reduction, the resulting aggregate FIRR of the most promising subproject was 13 percent (barely above OCC), with 5 years of economic life of irrigation investments. If other project costs of USD 28 million (USD 25 million without taxes) are accounted for, without considering their potential benefits, the FIRR under the most promising scenario is 16 percent (considering 5 years of economic life of irrigation investments). The FNPV for a total Project investment of USD 129.1 million – USD 100.5 million on subprojects – would be USD 43 million.

5. **Economic Analysis.** Based on estimates for the 5th year of operation, the average annual economic net income increases by USD 1,270/Family or USD 1,930/Ha (2.5 fold increase). The Economic Internal Rate of Return (EIRR) of the nine most promising subprojects ranged: from 21 to 56 percent with an average of 41 percent, when the economic life of irrigation investments was assumed to be 5 years; and from 26 to 58 percent with an average of 44 percent, when such an economic life was 10 years. **In line with the screening process described above, the expected EIRR can be around 41 percent and the ENPV for a total investment on subprojects of USD 100.5 million (USD 90 million without taxes) would be USD 140 million.** If the screening process is not as effective, the average EIRR can be around 25 percent with 5 years of economic life of irrigation investments, and 29 percent with 10 years of economic life of irrigation investments. If gross income with project is reduced by 20 percent, the aggregate EIRR of the most promising subprojects is 32 percent, with 5 years of economic life of irrigation investments. Finally, if other project costs of USD 28 million (USD 25 million without taxes) are accounted for, without considering other potential benefits, the average EIRR under the more promising subprojects' scenario is 26 percent, considering 5 years of economic life of irrigation investments – still above the OCC. The ENPV for a total Project investment of USD 129.1 million (USD 116 million without taxes) – USD 100.5 million (USD 90 million without taxes) on subprojects – would be USD 118 million.

6. **Fiscal Impact.** Based on estimates for the 5th year of operation, the average annual net fiscal revenue increases by USD 340/Family or USD 520/Ha (1.9 fold increase). Leaving out fiscal outflows associated with Project grants, the NPV of fiscal revenues from the nine most promising subprojects is USD 2,500/Family, when the economic life of irrigation investments was assumed to be 5 years; and USD 2,400/Family, when such an economic life was 10 years. **In line with the screening process described above, the expected NPV of**

fiscal revenues can be around USD 2,500/Family. If the screening process is not as effective, the expected NPV of fiscal revenues can be around USD 1,870/Family with 5 years of economic life of irrigation investments, and USD 1,780/Family with 10 years of economic life of irrigation investments. If no other costs and benefits are accounted for, average matching grants could be around USD 2,500/Family so as to maintain a balanced fiscal account in the medium term.

7. **Trade Balance.** Based on estimates of Hombro a Hombro Strategy on share of imported agricultural goods, and FAO statistics on export share of products considered in analyzed subprojects a trade balance analysis was performed. The net balance of exports minus imports, and thus of foreign exchange net inflows, is measured by the aggregate NPV of the most promising scenario. Without other project costs, such a NPV is around US$ 36 million. Considering other project costs, the NPV of foreign exchange inflows is US$ 14 million.

8. In order to monitor progress toward the achievement of expected financial, economic and fiscal returns of subprojects, the Project management team within the Ministry of Agriculture will work with producers' associations and other parties involved in developing routine procedures, where ex-ante assessments of costs and benefits are easily linked to result assessments of executed subprojects at Mid-term Review and for Final Evaluation. Relevant participatory assessment methodologies were tested during project preparation, and in light of favorable results, were adopted as rural extension instruments in the Ministry.

Annex 6: Description of main MAGAP's projects and programs

ECUADOR: Sustainable Family Farming Modernization Project

1. The following actions are currently implemented directly by MAGAP and would complement the investments of the proposed Bank/AECID Project:

Hombro a Hombro Strategy

2. This is a long-term program being implemented during the period 2013-2017. The Strategy invests approx. USD 30 M per year to establish a new approach for the provision of agricultural extension services at local level and across the country. The Strategy started implementation in the poorest areas of the provinces in the Sierra, as well as in Esmeraldas, Manabí and Santa Elena. In a first phase, 160 parishes were covered with services in five provinces; in 2014 the program reached all of the 10 Andean provinces with full coverage of parishes through approximately 1,000 technicians (one agronomist and one livestock specialist per parish), covering an average of 150 producers per technician. Technical assistance needs are defined with local producers and stakeholders, on the basis of prioritized productive sectors. This program does not work with producers of rice, bananas, sugar cane and palm oil, which are served by other MAGAP's programs. In the field, the nature of the work of technicians is rather multi-sectoral as they:

3. Contribute to the productive reactivation of the parish as per its productive profile and main value chains by analyzing problems and gaps, while prioritizing the provision of technical and institutional support to key stakeholders across the different value chains.

4. Promote access to on-farm and collective investments and services as required by producers and their organizations, such as:

5. Production, processing, and distribution of seeds of higher quality for 11 different crops, including packages of agricultural inputs with low chemical impact.

6. Agricultural mechanization: (i) developing the local small industry of agricultural implements and machinery, adapted to family farming systems; (ii) promoting agricultural innovation networks with producers, public institutions, NGO's, and universities; (iii) Creation of regional centers for the provision of farm mechanization and technical services for irrigation systems.

7. Establishing four major regional trading systems (approx. USD 150 million) with participation of producers and their organizations which would operate on wholesale markets in major urban areas, develop and optimize the functioning of agricultural value chains.

8. Facilitate the access of local producers to different services provided by MAGAP, i.e. legalization of land and agricultural insurance.

Buen Vivir Rural Program

9. The objective of this Program is to promote socio-economic inclusion, agricultural diversification, and food sovereignty within the Productive Transformation Agenda of Ecuador. The Program is funded by IFAD and focuses on 41,000 families living in extreme poverty. The Program finances 100 percent of pre-investment costs and between 60 and 90 percent of final investments, once proved feasible and depending of a typology of project beneficiaries. With a priority focus on poverty reduction, the program invests in associative projects (average 50 families / USD 4,000 per family), while strengthening local capacities. The program transfers resources to producers' organizations which administer the funds and implement their own sub-projects. After a recent mid-term evaluation, the Program is scheduled to end in December 2017 and has financed 120 sub-projects while is preparing another 40 sub-projects.

10. Across the Sierra, the Program is working with nine Technical Implementation Units covering 219 rural parishes of 12 provinces (Ibarra, Esmeraldas, Carchi, Chimborazo, Cañar, Tungurahua, Bolivar, Los Rios, Manabí, Santa Elena, Loja, Azuay). On the basis of Rapid Rural Appraisals, the Program prepares investment ideas and evaluates their pre-feasibility and feasibility. Also, the Program promotes sanitary standards, agricultural risk management, implementation and certification of good agricultural practices, establishing of revolving funds in communities, as well as rural self-employment options and small and medium entrepreneurship to help reduce migration to urban areas, among others. In a smaller portion, the Program has financed some micro irrigation projects with a focus on natural resource management and agro ecology.

Participatory Technology Innovation and Agricultural Production Project (PITPPA)

11. The PITPPA, also known as Innovation Project, is implemented by the Coordination Office of Innovation and reports directly to the MAGAP Minister's Office. The Project envisages a total investment of USD 417 M (2013-2017) to benefit 400,000 small farmers throughout the country. This is an umbrella Project that implements direct investment identified by the *Hombro a Hombro* Strategy and other MAGAP's Programs. In this sense, wherever possible, this Project could complement the investments to be made by the proposed Project WB/AECID Project, especially in the areas of agricultural development, technology modernization, food processing and value-addition, as well as agricultural value-chain development.

12. The Project prioritizes its investments in nine different crops (i.e. yellow corn, quinoa, plantains, bananas, cocoa, coffee), as well as the support to family farming, including on-farm irrigation, technical assistance and training, strengthening of productive chains (studies, investment for productive transformation, and market development), and of producer's associations.

Annex 7: Greenhouse Gas Accounting Analysis

ECUADOR: Sustainable Family Farming Modernization Project

Background and Methodology

1. In its 2012 Environment Strategy, the World Bank has adopted a corporate mandate to conduct greenhouse gas (GHG) emissions accounting for investment lending. The quantification of GHG emission is an important step in managing and ultimately reducing GHG emission, and is becoming a common practice for many international financial institutions.

2. To estimate the impact of agricultural investment lending on GHG emission and carbon sequestration, the World Bank has adopted the Ex-Ante Carbon-balance Tool[38] (EX-ACT), which was developed by the Food and Agriculture Organization of the United Nations (FAO) in 2010. EX-ACT is a land-based appraisal system that allows the assessment of a Project's net carbon-balance, defined as the net balance of CO2 equivalent GHGs that were emitted or sequestered as a result of Project implementation compared to a business-as-usual scenario. EX-ACT estimates the carbon stock changes (i.e. emissions or sinks of CO2) as well as GHG emissions per unit of land, expressed in equivalent tons of CO2 per hectare and year. EX-ACT can be applied for a wide range of agriculture and forestry development projects as it covers a wide range of activities (e.g. afforestation, agroforestry, improved crop and livestock production practices, improved water management, use of inputs, building of infrastructure, etc.) and aims to support Project designers in identifying Project activities with high potential for climate change mitigation and can thus support planning and decision making.

Application of EX-ACT for the Project

3. **Project area.** The Project finances investments in the modernization of small on-farm irrigation infrastructure (gravity-fed, hand-moved sprinkler systems). In the areas with investments in irrigation infrastructure, the Project also focuses on sustainable natural resources management, particularly watershed management and effective irrigation management. In addition, the Project finances extension services that aim at enhancing the environmental sustainability of their agricultural production through improved agronomic practices, and at enabling beneficiaries to transform and adapt their production systems to market needs (e.g. change to high-value cash crops). The Project area covers approximately 12,400 ha (World Bank and Spanish Cooperation financing). The GHG accounting with EX-ACT for the Project considers the investments in on- and off-farm irrigation infrastructure and the resulting changes in agricultural activity, management, and inputs.

4. **Data source.** Information for the GHG accounting is drawn from feasibility studies of rural investment sub-projects with irrigation technology components for small and medium-scale family farming, which have been recently funded by the Ministry of Agriculture. The Sub-Secretariat for Irrigation of the Ministry of Agriculture shared the data

[38] http://www.fao.org/tc/exact/ex-act-home/en/

of these subprojects, and those similar to the ones expected to benefit from the Project at hand were considered for the GHG accounting analysis[39]. The selected subprojects are localized in various provinces, which are also be targeted in the Project: Azuay, Chimborazo, Carchi, Loja, Los Rios, Manabí and Santa Elena.

5. **Basic assumptions.** Ecuador has a tropical climate and moist moisture regime. The dominate soil type is High Activity Clay soil. The Project implementation phase is 5 years and the capitalization phase is assumed to be 20 years, which indicates the longevity of the infrastructure. This amounts to 25 years implementation period which is in the standard range for the use of EX-ACT40. For the analysis, the "Business as usual scenario" is expected not to differ from the "Baseline scenario". This default scenario is deemed reasonable as changes in agricultural activity depend on the technology available, which is a contribution of the Project at hand. The GHG analysis further assumes that the dynamics of change are linear over the duration of the Project.

6. **Irrigation systems.** In the current situation, the Project area is equipped with surface irrigation systems (12,400 ha). Without the Project these surface irrigation systems would remain in place. With the Project gravity-fed, hand-moved sprinkler systems will be introduced to the whole Project area, which will not require pumping and hence no electricity consumption. The introduction of more modern irrigation will lead to more efficient water use as well an increased agricultural production. Based on the review of the subproject information and a feasibility study of a national irrigation program for small and medium-scale family farming by the Ministry of Agriculture -of which the Project is considered an integral part-, we assume that with the Project 15% more agricultural land will be used (leading to a total of 14,260 ha). This increase is expected to primarily be due to the land use changes and agricultural intensification for perennials described in the following.

7. **Crop production and Land Use Change.** Currently, the largest share of cultivated land is under annual crops. Based on the information from the subprojects, with the modern irrigation infrastructure and the technical assistance to be provided by the Project a strong conversion from annual to perennial crops is expected. Land that is currently used for annual crop cultivation (particularly yellow maize), is expected to be converted to land for production of cocoa, avocado, and peppers, among others (7,537 ha). In addition, some land use change to perennials can be assumed from currently moderately degraded grassland (1,750 ha). Both land use changes are accounted for in EX-ACT's "Land use change" module. 2,194 ha that are used for perennial crop cultivation at baseline are expected to remain for perennial production, but with improved practices. In general, we assume that the activities of Component 2 will lead to improved agronomic practices and water management, which is captured in EX-ACT's "Cropland" module.

8. **Livestock.** The type of livestock subprojects to be financed by the Project are expected to be related to dairy cattle. From the information of the subprojects for small and medium-scale family farming in the Project areas, we expect only a very small increase in

[39] These are the same subprojects that were selected for the Economic and Financial Analysis.

[40] The 25 year timeframe for this particular project was chosen after consultation with the World Bank GHG helpdesk. The joint period of implementation and capitalization should not be shorter than 20 years when relevant land use change takes place. This is established as a minimum period by the scientific literature in which the most important impacts on carbon stocks are expected to take place (EX-ACT. User Manual. Estimating and Targeting Greenhouse Gas Mitigation in Agriculture; FAO, 2014). Similarly, the World Bank GHG Accounting Guidance Note #3 for Agriculture Sector Investment Projects recommends to consider a 30-year time horizon similar to the Economic and Financial analysis.

the mean number of dairy cattle heads per year (2% from 10,266 to 10,463 heads). In addition, the default assumption in EX-ACT is that with the Project the technical mitigation from feeding practices is 50% compared to 0% at baseline. Hence, although livestock results to be the main source of emissions for the Project, the balance is actually negative due to the assumed improved feeding practices.

9. **Inputs.** From the subproject data, we obtained detailed information on the use of different fertilizers (Urea, Phosphorus, and Potassium) for most of the crops cultivated in the Project area. For the few crop types for which information was missing, it was collected from publications by the Ecuadorian National Institute of Agricultural Research (INIAP). This information allows us to include fertilizer consumption in the GHG analysis, taking into account the land use changes and conversion to perennials described above, as well as the intensified utilization of cultivated land. Overall, we find that the use of Urea decreases by 26% given the conversion from annual to perennial crops. In contrast, the use of Phosphorus and Potassium increase by 44% each. Other inputs are related to the change from surface irrigation systems with runoff return (IRSS) to hand-held sprinkler systems. As described before, given that the new irrigation infrastructure to be built by the Project is gravity-fed, no increase in energy consumption is expected.

10. The input data to EX-ACT is summarized in the table below.

Activities	Baseline scenario	Business-as-usual scenario	Project scenario
Area under annual crops (in ha)	8,865	8,865	1,329
Area under perennial crops (in ha)	2,194	2,194	11,480
Dairy cattle (in heads)	10,266	10,266	10,463
Area on which surface irrigation systems are modernized (in ha)	0	0	14,260
Improved water management of annual crops on cultivated land (in ha)	0	0	1,329
Improved agronomic practices of annual crops on cultivated land (in ha)	0	0	1,329
Use of nitrogen fertilizer (in tons per year)			
i) Urea (N)	1,688	1,688	1,253
ii) Phosphorus	571	571	823
iii) Potassium	504	504	723

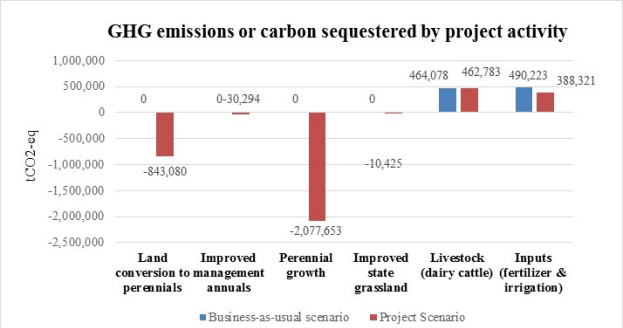
Results

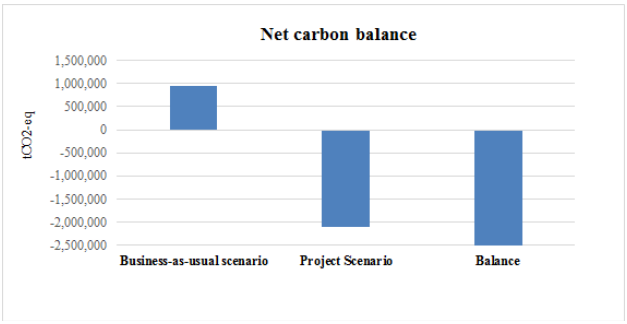
11. **Net carbon balance.** The net carbon balance indicates tons of CO_2 equivalent (tCO_2-eq) GHGs emitted or sequestered as a result of Project implementation compared to a business-as-usual scenario. Over the Project duration of 25 years, the Project constitutes a carbon sink of 3,064,648 tCO_2-eq (see table below). Most of the carbon sequestered is due to the increase in perennial crop cultivation from non-forest land use changes (2,077,653 tCO_2-eq). The improved agronomic practices and water management of annual crop cultivation also adds to the carbon sink with 30,294 tCO_2-eq. Livestock and inputs are the main carbon sources of the Project; however, compared to the emissions in the business-as-usual scenario the total emissions from livestock and input activities are lower, leading to a negative carbon balance of 1,295 tCO_2-eq and 101,902 tCO_2-eq, respectively. On a per hectare basis, the Project leads to a sink of 289 tCO_2-eq, which is 12 tCO_2-eq per year of the Project duration (see next page).

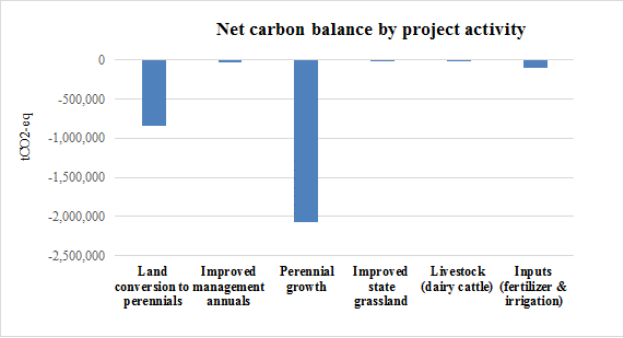
Project Net carbon balance.

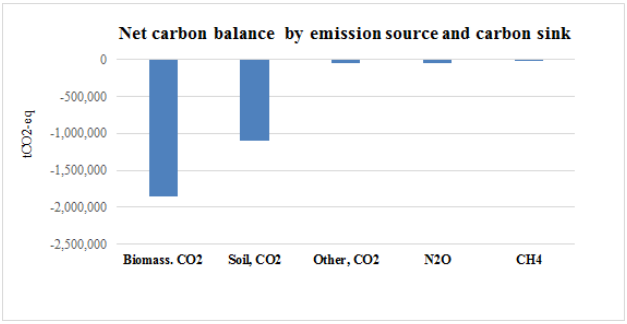
				Share per GHG of the Balance					Results per year		
Project activities/Changes	**Business-as-usual scenario**	**Project Scenario**	**Balance**	**CO2-Biomass**	**CO2-Soil**	**CO2-Other**	**N2O**	**CH4**	**Business-as-usual scenario**	**Project Scenario**	**Balance**
Land conversion to perennials	-	-843,080	-843,080	90,958	-934,037	-	-	-	-	-33,723	-33,723
Improved management annuals	-	-30,294	-30,294	-	-30,294	-	-	-	-	-1,212	-1,212
Perennial growth	-	-2,077,653	-2,077,653	-1,947,644	-130,008	-	-	-	-	-83,106	-83,106
Improved state grassland	-	-10,425	-10,425	-	-10,425	-	-	-	-	-417	-417
Livestock (dairy cattle)	464,078	462,783	-1,295			-	2,067	-3,361	18,563	18,511	-52
Inputs (fertilizer & irrigation)	490,223	388,321	-101,902			-54,259	-47,642	-	19,609	15,533	-4,076
Total	**954,301**	**-2,110,348**	**- 3,064,648**	**-1,856,687**	**-1,104,765**	**-54,259**	**-45,576**	**-3,361**	**38,172**	**- 84,414**	**-122,586**
Per hectare	90	-199	-289	-180	-104	-5	-4	-0			
Per hectare per year	4	-8	-12	-7	-4	-0	-0	-0	4	-8	-12

12. **Carbon sources and sinks.** The main carbon sources and carbon sinks are i) biomass growth due to cultivation of perennials, and ii) soil carbon sequestration due to non-forest land use change to perennials. The figures below provide an overview of i) the GHG emissions or carbon sequestered for the business-as-usual and with Project scenarios by Project activity, ii) the net carbon balance by Project activity, iii) the Project's overall net carbon balance, and iv) the net carbon balance by emission source.









13. **Caveats.** The Project will finance subprojects that are demand driven and not known ex-ante of the implementation. Hence, the locations and nature of the subproject can be very sensitive to the subproject screening process and the final section of sub-projects. The current analysis assumes that 100 percent of farmers participate in the Project and may thus overstate the impact of the Project.

Annex 8: Analysis of Land tenure issues

ECUADOR: Sustainable Family Farming Modernization Project

A. Introduction

14. A key consideration in making investments in irrigation is the extent to which intended beneficiaries have secure rights to the land they farm. International experience confirms that clear and recognized land rights are crucial for incentivizing on-farm improvements and responsible land stewardship. Where land rights are perceived to be insecure, the potential for conflict increases, farmers are less committed to the maintenance of infrastructure, and support from outside agencies such as banks or governments is less available or considered risky.

15. While the importance of secure land rights is widely accepted as a matter of general principle, identifying the appropriate indicators of security in a particular context can be challenging. In most developing rural areas, for example, evidence of land rights in the shape of land titles or cadastral records may be incomplete or non-existent. Formal land administration processes may not be present, or may operate at such low capacity and high cost that they are inaccessible to many rural land users. In such settings, requiring legally "perfect" evidence of land rights as a pre-requisite for investment in irrigation may have perverse effects – it could put participation beyond the reach of those small-holders who need it most, who in the majority of cases may be in peaceful and productive (if untitled) occupation of their land. As a result, the practice in many parts of the world has been to look for pragmatic, interim methods of confirming land rights, aiming to provide sufficient assurance for Project-level investments in the medium term, while wider land administration reforms continue over the longer term.

16. Rural land in Ecuador shares many of the above characteristics. A significant percentage of Ecuadorian farmers either possess titles that are out-of-date or incorrect, or hold undocumented possession of so-called *tierras baldías* (see B.iii, below). While national efforts are underway to extend the reach and improve the functioning of land administration[41], these are long-term endeavors. In the meantime, as described below, the practice of MAGAP has been to depend on a variety of alternative approaches which have generally proven sufficient to address the potential tenure-related risks to irrigation investment. These experiences have provided important lessons which form the basis of the Project's proposed approach to land rights issues, which is set forth in Section E of this Annex.

[41] The 2010 Constitutional reforms (Art 57; Art. 225, Art 226) support land titling and free land adjudication for ancestral land. Recent legal reforms such as Decree 373 (2010), the Technical Protocol for rural land titling (2013) and Land Civil Registry reforms (2013) aim at better supporting and enabling land titling. These reforms have allowed cadastral system innovation through improved technology, and strengthened incentives for land titling at the national level.

B. Rural land tenure in Ecuador

i. Categories of land rights

17. There are four broad categories of legally recognized land rights in rural Ecuador:

1. *Community right lands.* These are community or jointly owned lands in traditional systems. They are open to all members, usually with community restrictions on use and access. These lands could constitute ancestral territories.[42]

2. *Associative right lands.* These are lands owned by associations for individual or joint production (for example for agricultural cooperatives).

3. *Private land rights.* These rights include rights to dispose of land through sale, lease, inheritance and contingent obligations such as mortgages. They may be encumbered with varying degrees of restrictions and subject to other beneficial interests, such as leaseholds and sharecropping.

4. *State land.* Government and public land, including *tierras baldías* (see iii, below), including areas that have been encroached but not yet regularized.

ii. Titled land

18. Under law, a title provides the official legal guarantee of land rights. Land titling is the mandate of municipal property registration offices, and each municipality is responsible for administering the property records of each canton.

19. Despite the legal superiority of titles, coverage of rural areas by formal titling is incomplete. In many cases where titles have been issued, they are now out of date. According to different estimations, out of a total area of 27,166,700 hectares of agricultural land nationwide, only 30% or 8.15 million hectares is held under legal title. Approximately 58%, or 14 million hectares, has been titled in the past, but current landholders do not possess updated titles.[43]

20. The high incidence of outdated titles mainly stems from the fact that transactions such as purchases, sales, exchanges, and land fragmentation by inheritance are typically not registered. The failure of *posesionarios* (actual land users) to regularize these transactions is in large part a reflection of the cumbersome nature of the process and the high cost involved. While the costs vary in different parts of the country, the average is estimated to be approximately USD 3,000 including fees for (mandatory) lawyers, mapping, inspection, cadastral and notary services; municipal taxes; and the municipal permit-letter that allows registration of the property in the municipal cadaster.[44] In view of these high costs, the

[42] Ancestral lands in the possession of indigenous peoples who define themselves as nationalities with ancestral roots and Afro-Ecuadorians, as well as communities that form part of these social groups, pursuant to the provisions of Art. 84 of the Constitution.

[43] It should be noted that the figures presented here and in the next sub-section are indicative only. Records of titles are kept by individual municipalities, so aggregate figures are likely to be unreliable, and the incidence of outdated titles is in fact likely to be higher than the figure presented here. Figures concerning *tierras baldías* are generally considered more reliable, as this category of land is now within the remit of MAGAP.

[44] Documentation to be submitted for registration includes: (i) previous property titles; and certification of no encumbrance; (ii) the identification document (*cédula de ciudadania*) of the land owner; (iii) a copy of the owner's voting certificate;

practice of many land users has been to forego the formal process of updating the title, and instead to rely upon social norms within the community that recognize the legitimacy of their ownership.

iii. Tierras baldías

21. An additional important category of rural land are *tierras baldías.* According to law, *tierras baldías* are lands previously under the jurisdiction of the Ecuadorian Institute of Agrarian Reform and Colonization (former INDA) and now under MAGAP. These lands comprise the following: (i) All undeveloped land that is part of the National Territory with no other owner; (ii) lands that have reverted to the State for any legal cause (in accordance with Title II of the Law on Territorial Heritage, 1927; the Act of Vacant lands and Colonization,1936 and the Supreme Decree No. 162 1937); (iii) lands that remain or have remained uncultivated for more than ten consecutive years; and (iv) those lands awarded by the State but for which property titles have not be issued.

22. A significant number of agriculturalists are non-regularized occupants of *tierras baldías.* It is estimated that 12% or 3.3 million hectares falls into this category. As described below, MAGAP has pursued a variety of programs to regularize occupation on *tierras baldías,* with the aim of eventually enabling the issuance of full titles.

iv. Ancestral/indigenous lands

23. Available data suggests that 6,985,300 hectares, including both regularized and non-regularized land[45], and including huge areas in the Amazon region, belong to indigenous communities (e.g. Shuar, Achuar, Kichwa, among others) and Afro-Ecuadorian communities (e.g. in the Province of Esmeraldas).

C. Land in Project areas

24. The Project will finance two types of subprojects under Subcomponent 1.1:

- Type 1: Modernization of irrigation on-farm on existing collectively managed irrigation scheme (public and/or associative). This type of Project is designed to cover interventions within farmers' plots by modernizing their corresponding irrigation system and, when necessary, including interventions in the collective system. The assumption is 0.75ha benefitted by beneficiary.

- Type 2: Individual and/or collective small water reservoir and on-farm system outside of existing irrigation schemes. This type will basically consist in the construction of individual or collective small water storage infrastructure (ponds of an average of 1,200 cubic meters) that will capture water from rain or other sources without affecting

(iv) payment of the municipal annual tax (*impuesto predial*); (v) payment of municipal administrative fees for the registry. The land deed is notarized by a public notary, whose fees are regulated by national norms. Depending on the municipality, documents are kept digitally but most municipalities do not have electronic data bases.

[45] (Ecolex 2010)

third parties or the quantity or quality of water flowing through public / private canals or natural networks. These reservoirs will allow the introduction of modern irrigation techniques into farmers'. The assumption is 1.5 ha benefitted by beneficiary.

25. The Project will intervene in 10 *Sierra Central* and 7 Coastal provinces. The social assessment states that these 17 Provinces includes include 1,094,096 agricultural households between cultivating between 1 and 20 hectares. MAGAP estimates that *tierras baldías* covers 8% of total agricultural land in the *Sierra* and 15% for the Coast (as compared to the 12% national average mentioned above).

26. Within the Project area, the Project will support on-farm irrigation investment for 14,150 families in a total area of 12,400 hectares. Project's beneficiaries will be small and medium farmers, defined as follows according to agro-climatic regions:

- Sierra: 0 - 5 ha. (small farmers) – 5 to 20 ha. (medium farmers)
- Costa: 0-20 ha. (small farmers) - 20 to 40 ha (medium farmers)

27. The Project will not invest in the *Páramos* (protected areas in *Sierra's* Indigenous settled highlands) or nearby, where land is linked to indigenous traditional knowledge (including medicine and sacred sites), and ancestral land use distribution of communal land among individuals.

D. Current MAGAP strategies for addressing land tenure issues

28. During the period 2011-2014, new policies and technical instruments were issued to address land tenure informality in the context of MAGAP's investments in irrigation and other agricultural equipment supporting small and medium farmers. These were designed to comply with operational requirements while providing a stronger legal foundation for public investment (Project's Social Assessment draft April 2015). They involve alternative ways of confirming land ownership, without requiring the possession or issuance of full land titles. While these alternative measures fall short, in a strict legal sense, of the protection provided by titles, in MAGAP's experience they provide in practice a more than adequate basis for ensuring the sustainability of the public investment and incentivizing positive action by farmers.

i. Lessons learned from World Bank's Project and ongoing MAGAP projects

29. The following examples illustrate the application of these approaches in ongoing or recently completed MAGAP initiatives:

- In 2014, the Under-Secretariat of Irrigation and Drainage implemented 23 on-farm irrigation modernization projects, benefiting 7,383 families in an area of 8,014 hectares. Lack of formal land titles among beneficiaries was addressed by using alternative technical and social instruments to confirm land ownership. The main practice was to use SENAGUA's registry or cadaster of water use permits to confirm ownership of irrigated land by WUAs. State and commercial banks (such as *Banco de Fomento and Banco Solidario*) and micro-credits cooperatives, currently recognize this procedure and the technical instruments as acceptable collateral for credit to farmers. Commercial Banks also provide credit to local farmers without

formal land titles, by accepting the recognition given to farmers by the *Junta de Regantes*, through the cadaster of water users (*padrones).* According to the information provided by MAGAP, there is no land conflict on the 8,000 ha benefitted.

- Since 2013, MAGAP's ***Buen Vivir Rural*** **program** has implemented a total of 135 productive projects. The main legal instrument used by MAGAP in this program is the "accreditation" of beneficiaries, provided for by Ministerial Decree 610 (November 15, 2012). This Decree that "regulate[s] the procedure for delivering exceptional public resources to private land through programs and projects of productive development for the benefit of the community" which are referred to in the annual investment plans of MAGAP. Government investments use this accreditation to confirm farm land ownership, to help ensure that public investments cause or exacerbate land conflicts. MAGAP has registered only one case of conflict over land ownership under this program.

- Under the **Participatory Agricultural Technological Innovation and Production Project (PIT-PPA),** which supports productive organizations, the requisite for beneficiaries' participation is having a legally constituted organization. In this case, MAGAP accreditation and registration of the organization in the Popular and Solidarity Economy (SEPS) database confirm the land ownership. The certifications enable government investment to benefit land owners despite the absence of official land title.

- The ***Proyecto de Inversiones de Desarrollo Productivo*** **(PIDD)** in Chimborazo Province (P094784), which closed in June 2014, was supported by the World Bank. The PIDD financed subprojects of modernization works for 55 small and medium scale collective irrigation systems, benefiting 4,685 ha and 7,900 families. The Project's strengthening of Water User Associations (WUA) was effective because social practices confirmed the legitimacy of WUA leadership, as well as competence of WUA's to mitigate and settle conflicts before investments took place. According to the information provided there were no conflicts over land among Project beneficiaries, who through the endorsement of the local organizations confirmed their land and water rights.

30. According to the Project's Social Assessment, MAGAPs eligibility criteria for current investments benefitting small farmers have proven effective when engaging local irrigation organizations such as the *Juntas de Regantes* (WU) legalized by the SENAGUA, and the national organization that brings them together (JAAPR). Other major local organizations supporting MAGAP's investments include local groups representing peoples and nationalities and associated with the National Confederation of Indigenous Peoples CONAIE, the National Confederation of Indigenous and Black Peasant Organizations (FENOCIN), the Ecuadorian Indians Federation (FEI) and the Council of Evangelical Indigenous Peoples and Organizations of Ecuador (FEINE). In addition, the representatives of the local decentralized governments, the Juntas *Parroquiales*, are relied upon by MAGAP to confirm land possession and WUAs, a mechanism based on social practices. The MAGAP's support and coordination with all these organizations in parallel has been a key entry point for further land regularization (Project's Social Assessment draft April 2015).

ii. Ongoing MAGAP rural land legalization initiatives for Tierras Baldías

31. Currently MAGAP's Under-Secretariat of Land is implementing a Project titled "*Land Access for family farmers and land legalization within the Ecuadorian territory"* (ATLM 2010 -2016) which is supporting land adjudication and titling of individual and collective land (art. 50 of *Ley de Desarrollo Agrícola* and art. 64 of the Norm). According to the information provided, the process includes seven steps:

1. Legalization request;
2. Confirmation of land possession and parcels' boundaries. As per the Executive Decrees 1092 (2008) and 373 (2010), a technical protocol defines the requirements for issuing the parcels maps of the land to be adjudicated;
3. Elaboration of a *technical report* and management plan. After this stage, land ownership is regarded as secure (see below);
4. Land valuation and acquisition payment;
5. Adjudication;
6. Notary Registry; and
7. Issuance of land title.

32. The so-called ***technical report*** (step no 3) confirms the extent of the land parcel. It analyzes all information gathered about the ownership of the property and confirms the legitimacy of the owner of the farm or farms. This task is implemented by MAGAP's brigades, technical teams assigned to the decentralized MAGAPs, which are responsible for expediting the process of legalization. The MAGAP's ***technical report*** of land ownership does not involve costs for land users. Once the plot area is measured with support from the technical brigades, with borders defined and all land disputes settled, a map is issued, and land users pay for the *land acquisition* at a cost defined by the legal norm which applies for all land users. According to MAGAP, the total cost for land acquisition for all land *posesionarios* on *Tierras Baldías* is less than *USD $*20 per transaction[46].

33. During the period 2011-2014, about 170,000 land parcels were adjudicated (step 5) representing about 335,000 hectares.

iii. *Methods for dealing with unofficial /irregular transferred ownership*

34. This case occurs when land has been subdivided or transferred informally through inheritance/ donation, exchange, or others without processing the required update of a previous land title, which in Ecuador is a common practice. The regularization of those cases is not within MAGAP's competencies, but is under the Municipalities. Potential conflicts that could emerge are regulated by the Civil Code under the judicial system. As noted in Section B, above, the costs of regularizing titles is often prohibitively high for small farmers, and in practice, this is a process that is frequently avoided.

35. Although the regularization of outdated or inaccurate titles or the issuance of new ones is not within MAGAP's mandate, MAGAP has developed a number of practical

[46] There are cases when MAGAP uses the Cadastral System of SIGTIERRAS, a pilot project under implementation, for the legalization process and further land titling.

methods of addressing risks related to this phenomenon, which are discussed in section E.iii below.

E. Proposed Project Approach to Land Rights Issues

i. Balancing risks with the need for a pragmatic way forward

36. The risk assessment[47] undertaken as part of Project preparation shows that lack of land titles is a concern for the Project, MAGAP and the beneficiaries. Irregularities in land ownership are common phenomena among small and medium size farmers, and to a certain extent viewed as "a fact of life." Nevertheless, for the Bank, the implementing agency and the potential beneficiaries, a certain level of land ownership security is critical to confirm before investing either on-farm or off-farm, in order to enable sustained engagement by beneficiaries in improving their land and maintaining infrastructure, and to reduce risks of post-investment land grabbing and other social conflicts.

37. On the other hand, requiring land title as an eligibility criteria would likely be counter-productive. It would:

- Exclude, *de facto*, the poorest tranche of farmers (*posesionarios*), who are not in a position to pay the cost for land title regularization (about US$ 3,000 per transaction in case of irregular/unofficial transfer);
- Create substantial risks of delays in the subproject cycle and in the implementation of the Project as a whole; and
- Prevent implementing the Project in the collectively-managed irrigation schemes (70% of the expected total of investments sub-projects), where interventions cannot be done on a piecemeal basis (i. e. benefitting only the holders of land titles and leaving untitled *posesionarios* out of the process). These kinds of irrigation schemes need to be approached as whole systems.

[47] For the risk assessment of the proposed project, the team carried out an analysis including the following activities:

- Review of the current land titling procedure of *tierras baldías* carried out by MAGAP, a procedure that is currently subjected to MAGAP's support and investments;
- Assessment of the current requirements for updating land titles;
- Review and analysis of social practices that allow MAGAP investments in irrigation, addressing the limitations and achievements. This included documenting the operational approach for technical and legal support provided, time involved for land legalization and funding required;
- Defining procedures and timing needed during the project cycle to avoid bottlenecks for the initiation of subprojects technical studies;
- Identify incentive mechanisms for projects beneficiaries to update their land titles.

38. Therefore, the challenge for Project design has been to define:

- Appropriate opportunities for confirming land ownership with alternative non-title mechanisms that are widely used by public and private institutions, in order to avoid exclusion of the poorest tranche of farmers, when it is well known that many potential beneficiaries will not be in a position to obtain title, mainly for economic reasons.

- Situations in which requiring a land title as an eligibility criteria may be essential, when the risk to Project investment is considered too high in its absence (as in the case of individual ponds, representing approximately 30% of investment sub-projects, as described below)

ii. Proposed Project interventions in Tierras Baldías

39. During appraisal it was agreed that a formal cooperation agreement will be signed between the Project, the Under-Secretariat of Irrigation and Drainage (SRD) and MAGAP's Under-Secretariat of Land. The objective is to ensure a timely accomplishment of Step 3 in the process described above – the issuance of the Technical Report. In doing so, effective coordination is required to ensure the Project will benefit from the Under-Secretariat's brigades working in Project sites. It was agreed that the Project will support the preparation of topographic surveys (included in the Sub-Project Feasibility Study) and provide close on-demand support and legal advice to Project beneficiaries. These costs are considered part of the Project budget.

40. Drawing on the lessons learned from the ATLM (*Land Access for family farmers and land legalization within the Ecuadorian territory*), the time for issuing the Technical Report is estimated to be two months, once the pre-requisite of "peaceful and uninterrupted" land possession is established. Therefore this will be the period to be observed during the Project's pre-investment stage. The process between the issuance of the Technical Report (step 3) and the adjudication (step 5), which is a requisite for investment in the case of *tierras baldías* (see table below) is also considered to take two months.

41. The Project will also take into account the cadastral information issued by SIGTIERRA's MAGAP program in the cantons, when available. This is information includes recently gathered geo-referential information, which is delivered to the respective GADs. However as of 2015, this program has only covered 10% of the national total (21 cantons out of 221 cantons).

iii. Dealing with unofficial /irregular transferred ownership

42. As noted, the processing of land titles is not within MAGAP's competency. Therefore alternatives have been analyzed, and the Project will utilize two approaches to the confirmation of land ownership, drawing upon the precedents discussed earlier.

- The Project will require the accreditation by MAGAP of the producer's organizations or individual agricultural producers, following MAGAP's Ministerial Agreement 610 of November 15, 2012. This accreditation will document land information such as plots/parcels borders and land ownership status.

- The Project will request certificates from the Irrigation Boards (WUAs). These

WUAs are approved by SENAGUA and their registries include all users of irrigation and confirmation of land irrigated within their system. The accreditation of the WUAs encompasses the recognition of the organization, list of members, irrigation management plan, cadastral information, and documentation about technical aspects such are irrigation rights, frequency, and confirmation of land parcels irrigated. In sum, it provides social confirmation of land ownership.

43. As needed, certification issued by the *Junta Parroquial* (local government) may also be required as confirmation of the beneficiaries peaceful and uninterrupted land possession for 5 years.

44. Based on lessons learned from previous MAGAP interventions, when there are disputes which are the competence of the Civil judges, there are two procedures proposed for the Project to expedite the resolution of those disputes:

- Obtaining a certificate of lawful inheritance (confirmation of legitimate successors/ heirs; definition of landholding extension/ borders) confirmed by a judge's verdict. A civilian judge settles and sentences in cases of disputes or claims, and according to the norm, the verdict is part of the documentation for the Property Registry to issue the land title.
- Facilitating agreements among the interested parties (in case of disputes over succession, land borders, etc.) issued by a Mediation Center under the Judicial System.

iv. Distinguishing between collective irrigation investments and individual ponds.

45. It has been agreed that different requisites should be applied for the collective irrigation schemes and the individual ponds, as follows:

46. For collectively managed irrigation schemes, it is proposed that:

- At pre-investment stage, the beneficiaries should submit to the Project unit the accreditation of the official registry (*Padrones*) of the WUAs at the beginning of the sub-project cycle. The MAGAP's accreditation should be obtained while the Project profile is prepared.
- At investment phase, only the formal ownership verdict issued by a civil judge or an agreement signed in a Mediation Center that is part of the Ecuadorian judicial system, will be accepted to initiate investments.

47. For individual ponds (mainly in Coastal region), it is proposed that

- At pre-investment stage, the beneficiaries should submit to the Project unit the accreditation or certification of the *Junta Parroquial* for land possession. The MAGAP's accreditation should be obtained while the Project profile is prepared;
- At investment phase, the land title will be required. It has been agreed with MAGAP that the absence of social endorsement for this kind of sub-Project would make on-farm investments too risky in absence of title.

48. The table below summarizes the proposed actions to be taken for land ownership verification and land titling.

1. COLLECTIVE EXISTING SYSTEMS		
Project Cycle	**Land without any previous land title <u>Within</u> the mandate/ competence of MAGAP**	**Unofficial / Irregular land ownership <u>Without</u> the mandate/ competence of MAGAP**
Pre-Investment phase (Feasibility) Verification of individual or community land holdings	**Initial requirement** • Accreditation by the official Registry (*Padrones*) of the local Water Users Associations (*Juntas de Regantes)* **Requirements at the final stage of Pre-investment** • Technical Report by MAGAP's Land Sub-Secretariat, (LST) (Art. 50 Agro development Law, and Art. 64 Norm of LDA). • MAGAP's accreditation (Art. 4 Ministerial Agreement 610 MAGAP). • SIGTIERRAS cadastral system, MAGAP (when available)	**Initial requirement** • Accreditation by the official Registry (*Padrones*) of the local Water Users Associations (*Juntas de Regantes)* **Requirements at the final stage of Pre-investment** • MAGAP's accreditation (Art. 4 Ministerial Agreement 610 MAGAP). • SIGTIERRAS, cadastral system MAGAP (when available)
I**nvestment phase** Verification of individual or community land holdings	**Initial requirement** • Adjudication certificate by the LST, MAGAP • (Art. 50 Agro-Development Law, and Art. 64 Norm of LDA).	**Initial requirement** • Certificate of lawful inheritance (confirmation of legitimate successors/heirs; definition of landholding extension/ borders) confirmed by a judge verdict. A civilian judge settles and sentences in cases of disputes or claims, and according to the norm, the verdict makes part of the documents for the Property Registry to issue the land title. • Agreements among the interested parties (i.e. successors, land borders disputes, etc.) issued by a Mediation Center under the Judicial System.

2. INDIVIDUAL AND NEW SMALL WATER STORAGES (ponds)		
Pre-Investment Phase **(Feasibility)**	**Initial Requirement** • Certification of Parish Board (*Junta Parroquial*) **Pre investment requirement** • Technical Report by MAGPs' Land Sub-Secretariat, (LST) • MAGAP accreditation • SIGTIERRAS cadastral system, MAGAP (when available)	**Initial requirement** • Certification Parish Board *(Junta Parroquial*) **Pre investment requirement** • MAGAP accreditation • SIGTIERRAS cadastral system, MAGAP (when available)
Investment	**Initial requirement** • Adjudication ST –MAGAP (Art. 50 LAD and Art. 64 Norm LDA)	**Initial requirement** • Land title

49. As shown in the Table, the Project includes the requirements for the two types of investments: the Collective systems and the Small Water Storage (ponds). These two types of investments require different documentation for Project beneficiaries in the pre-investment and investment phases.

50. In the pre-investment phase, incremental conditions have been defined, taking into account the time estimated by MAGAP to obtain the required certifications and accreditations to proceed with the investments.

51. The conditions required at the investment phase vary according to land tenure:

- conditions for collective systems differ from those requested for small water storages;
- the legalization of *tierras baldías* will require the "adjudication" step which will enable the land title to be issued by MAGAP;
- for cases of unofficial/irregular land ownership, the requirement is a formal judicial opinion (in the case of collective irrigation schemes) or a land title (in the case of individual ponds).

52. For the Project's investments on individual ponds and irrigation kits, expected mainly in newly irrigated areas in the Coastal region without previous WUAs, official land tittles will be required. In such cases the Project will provide legal advice and technical support to potential users as requested. According to the Project's economic assessment, potential users of individual ponds have the required resources for the regularization of land titling.

53. The Project will establish a registration and monitoring system of the subprojects requiring land regularization in order to provide timely and effective support to potential Project users and avoid delay and loss of investment. The system will be part of the Operation Manual.

54. The Project as part of its Grievance Redress Mechanism will document and report land related issues or conflicts that could emerge as a result of Project interventions. The Project will document and report to the Bank information including the source of conflict, people involved and activities put in place for addressing the issues, depending on the nature of the event. The procedure and content of the reports will be in the Operation Manual.

Annex 9: Map of Ecuador (IBRD 33399R)

ECUADOR: Sustainable Family Farming Modernization Project