No.

REPUBLIC OF PERU

MINISTRY OF AGRICULTURE･AGRORURAL

PREPARATORY SURVEY
FOR
THE PROGRAM OF SMALL AND MEDIUM IRRIGATION INFRASTRUCTURE IN THE SIERRA, PERU

FINAL REPORT (F/S)

March 2010

JAPAN INTERNANATIONAL COOPERATION AGENCY (JICA)

NIPPON KOEI CO., LTD.

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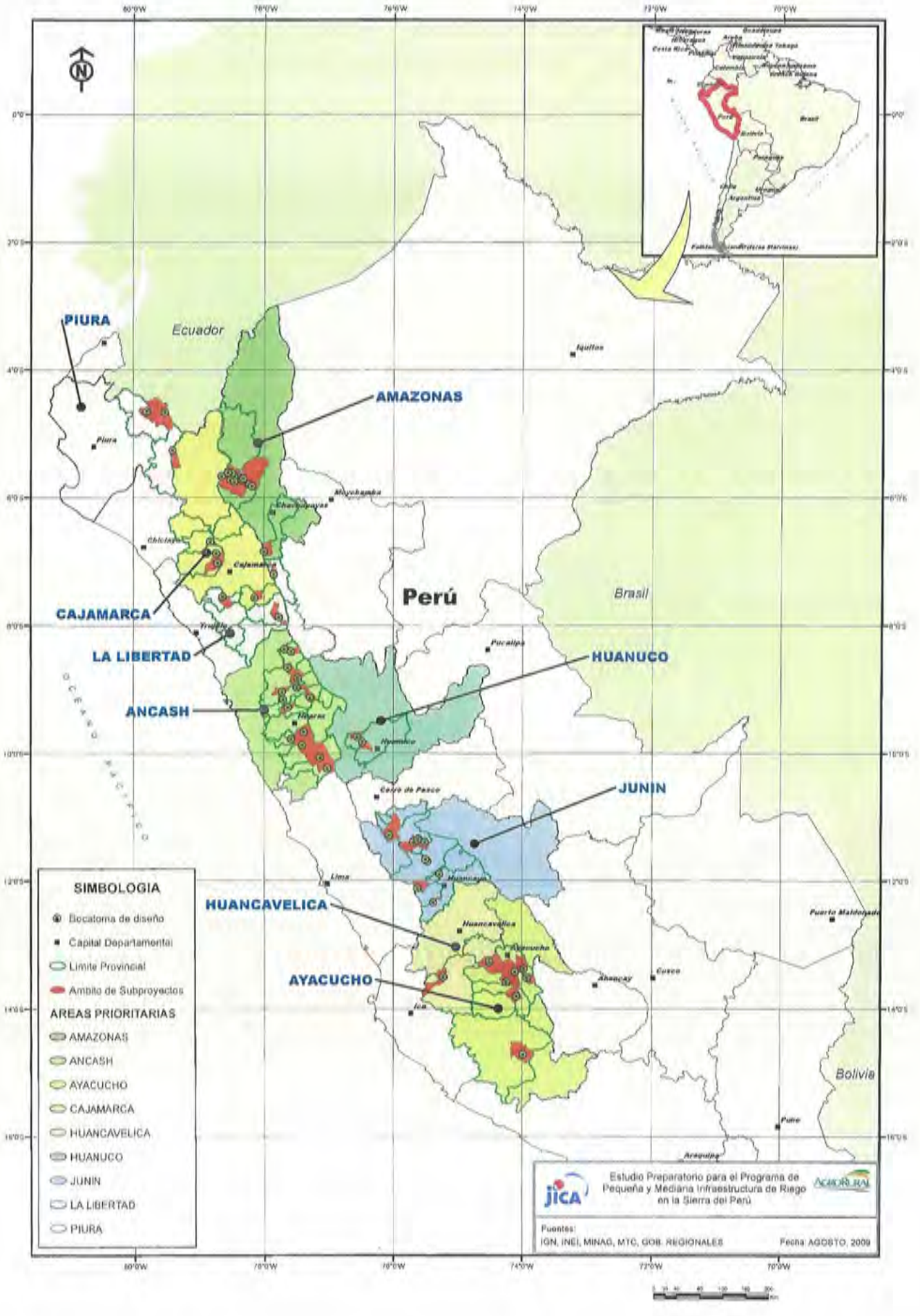
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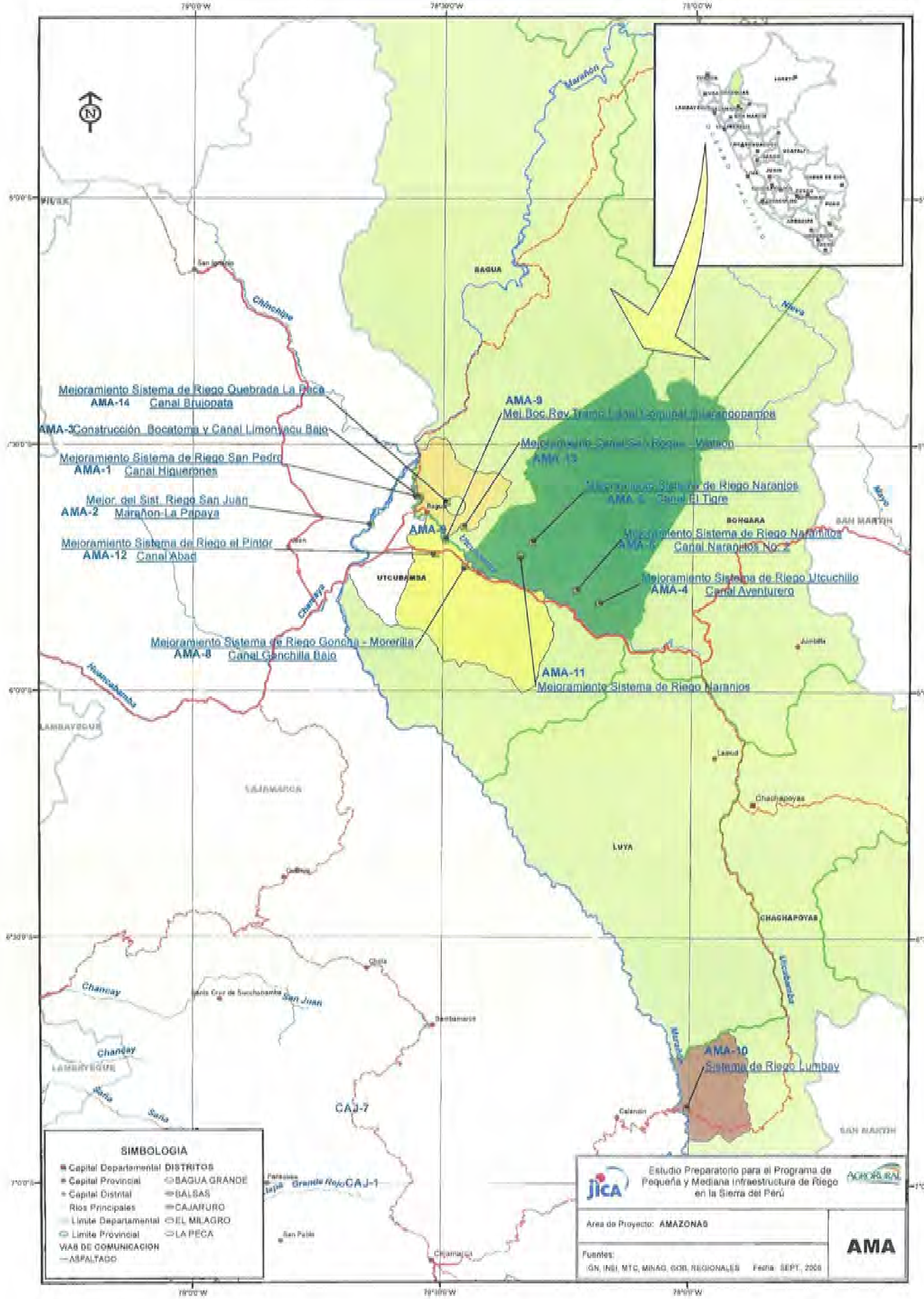

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CHIQUIAN
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POMABAMBA
QUICHES
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RECUAY
SAN JUAN
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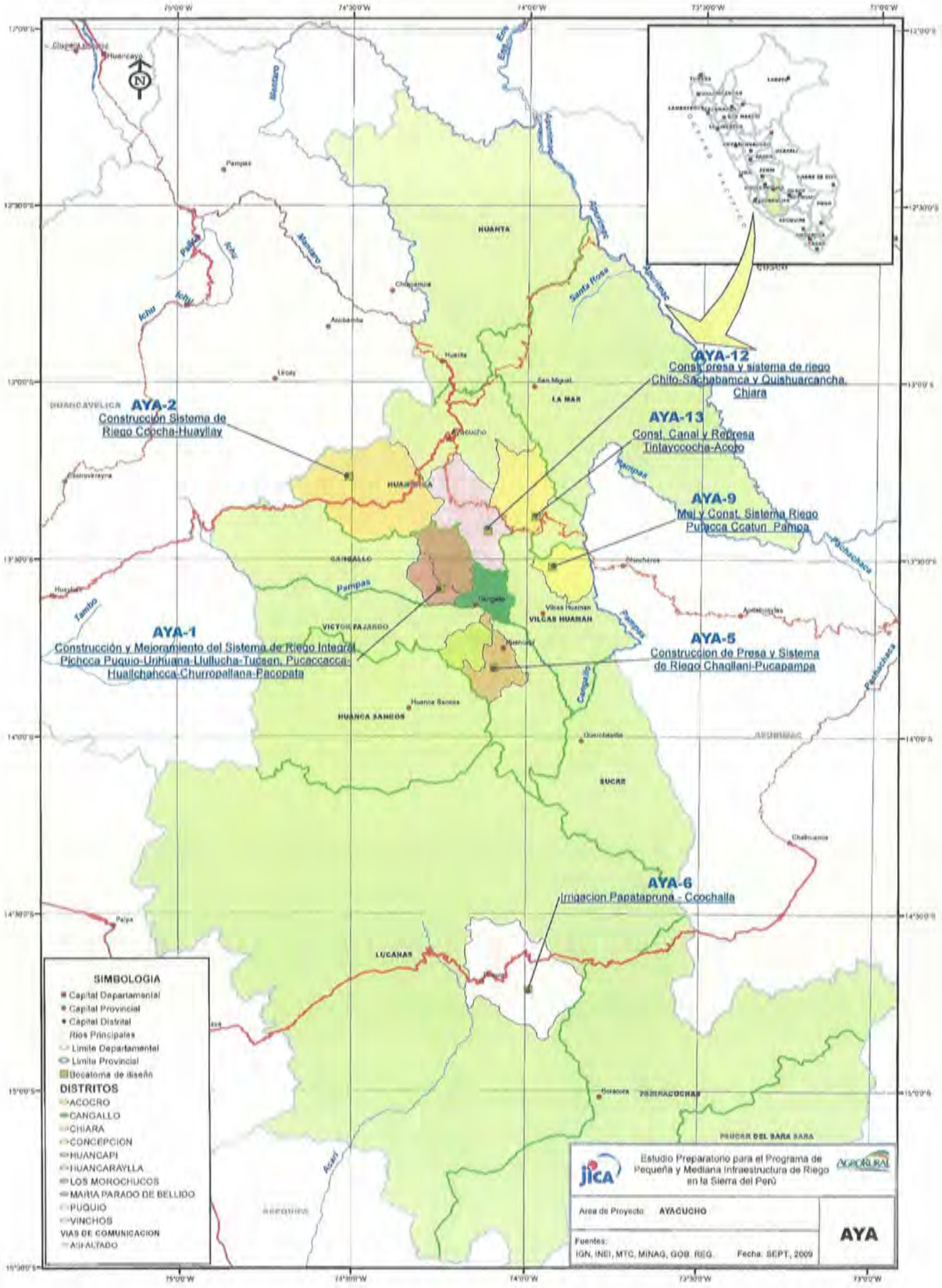
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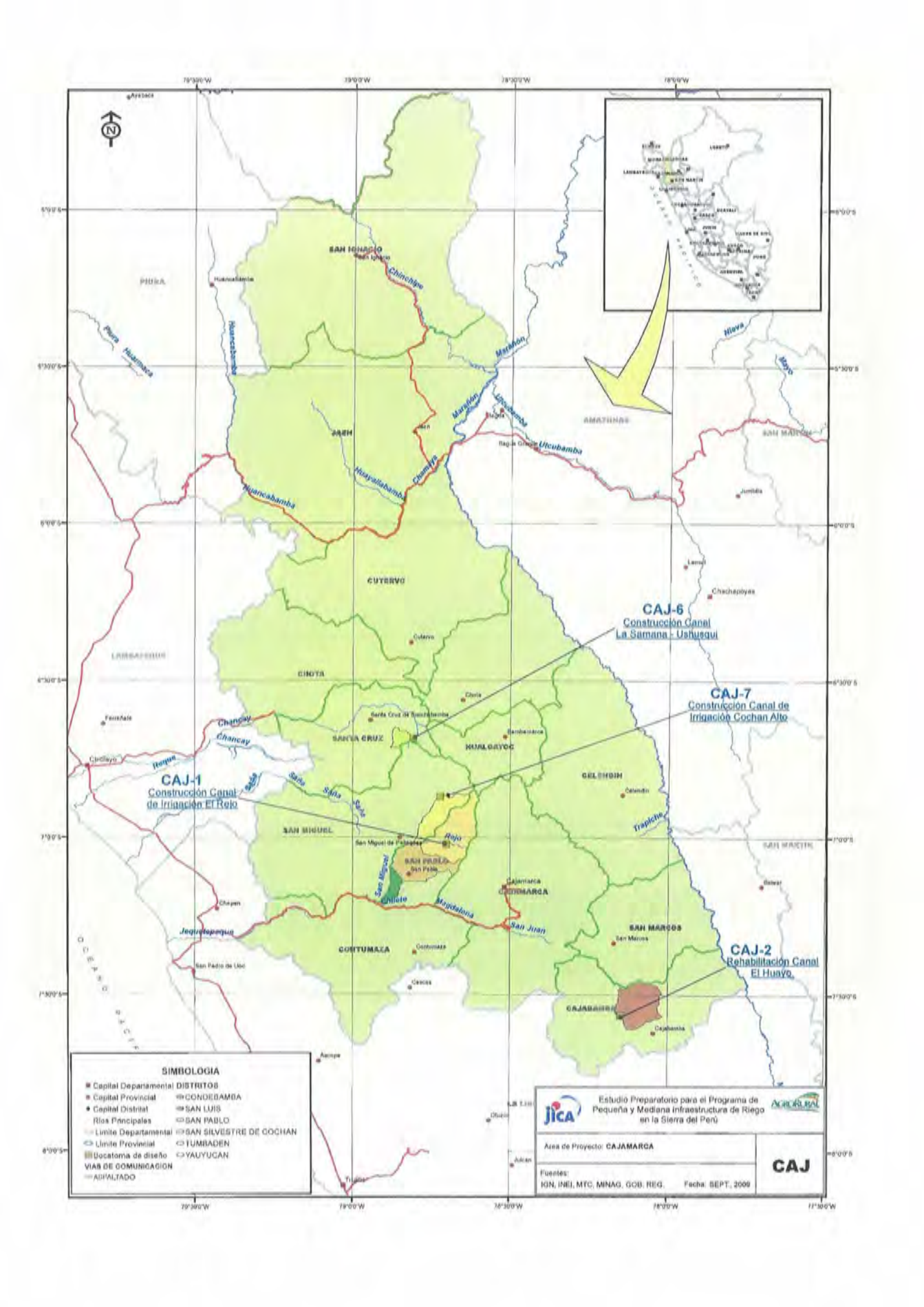
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SAN SILVESTRE DE COCHAN
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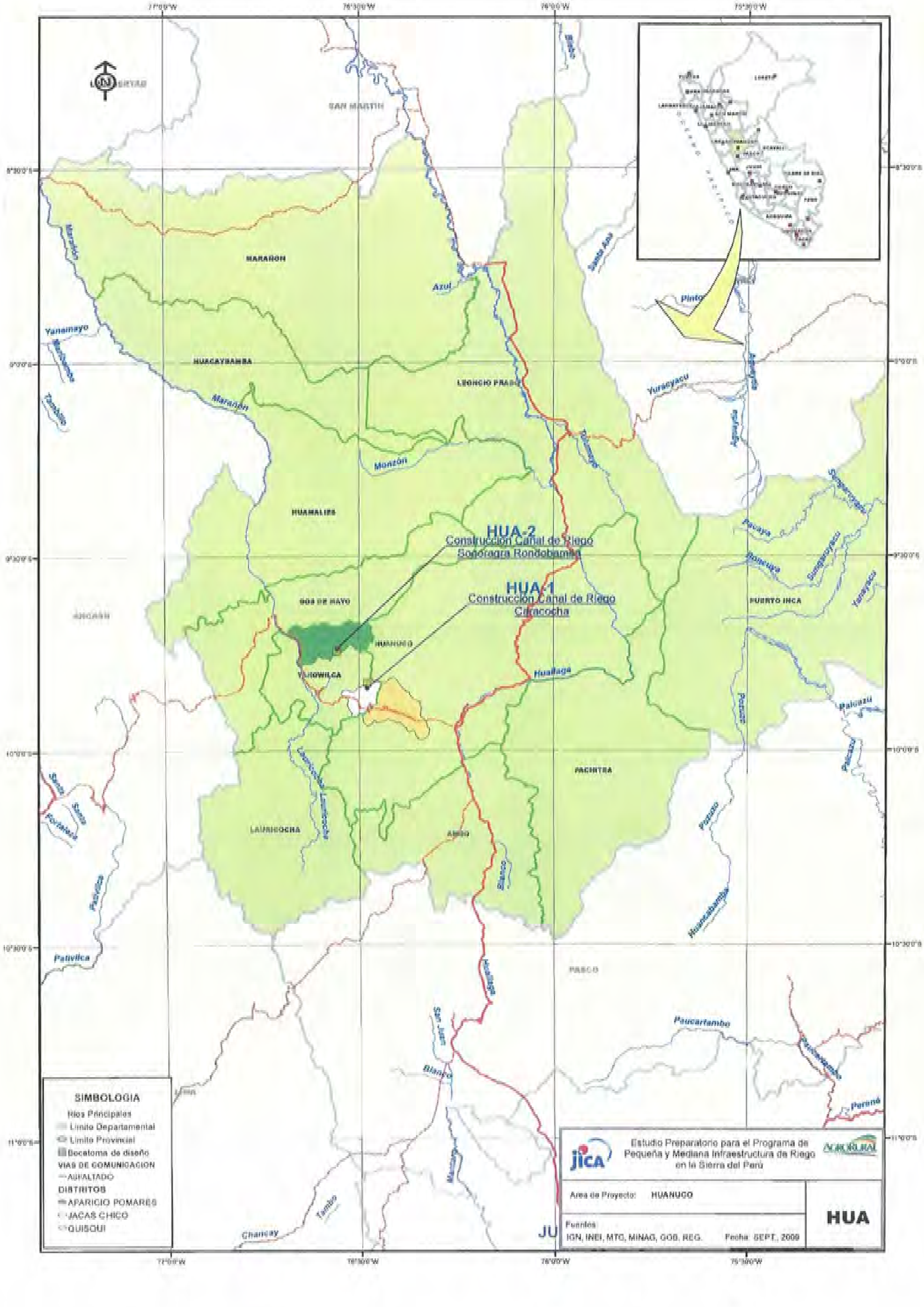

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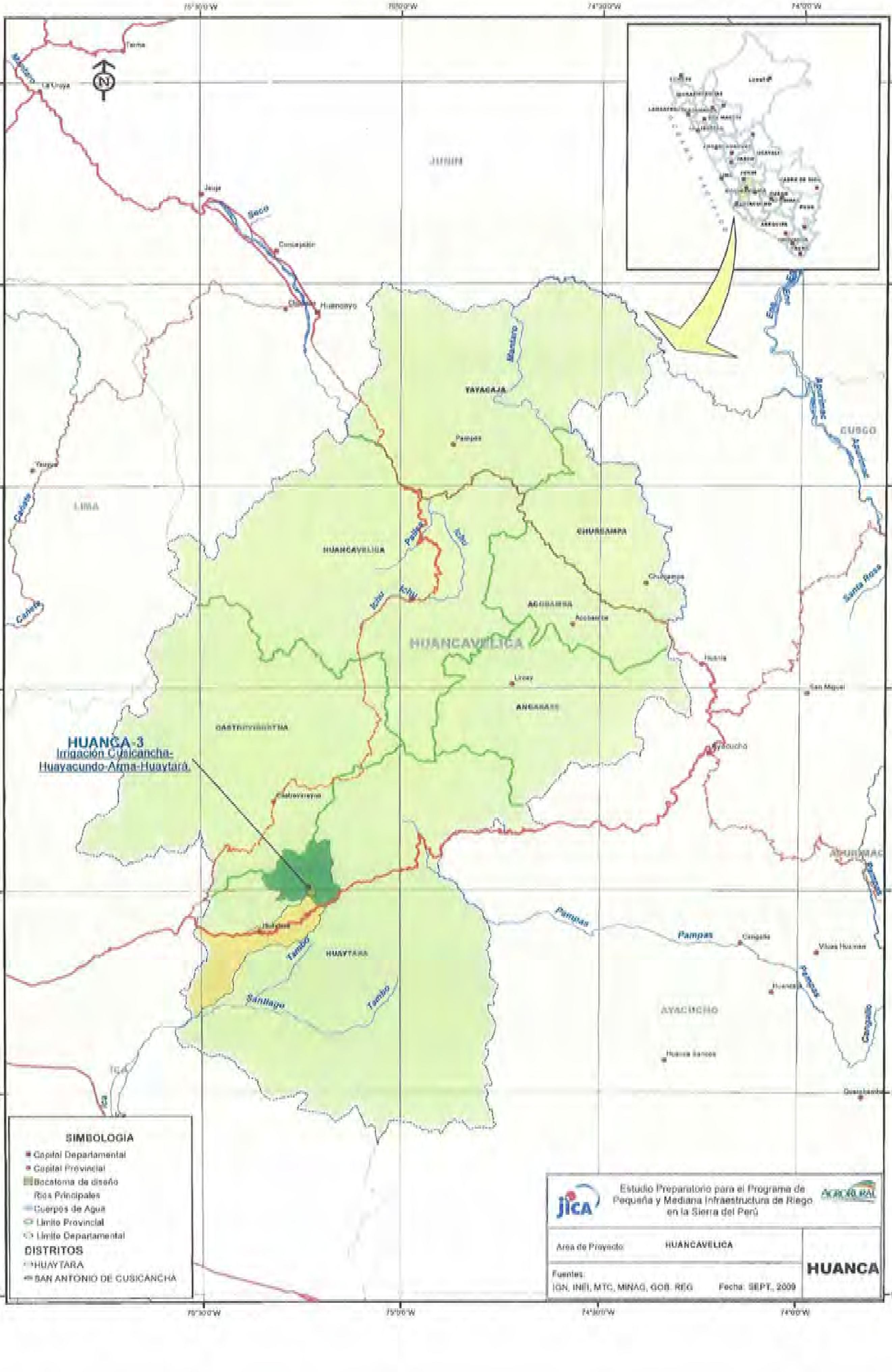
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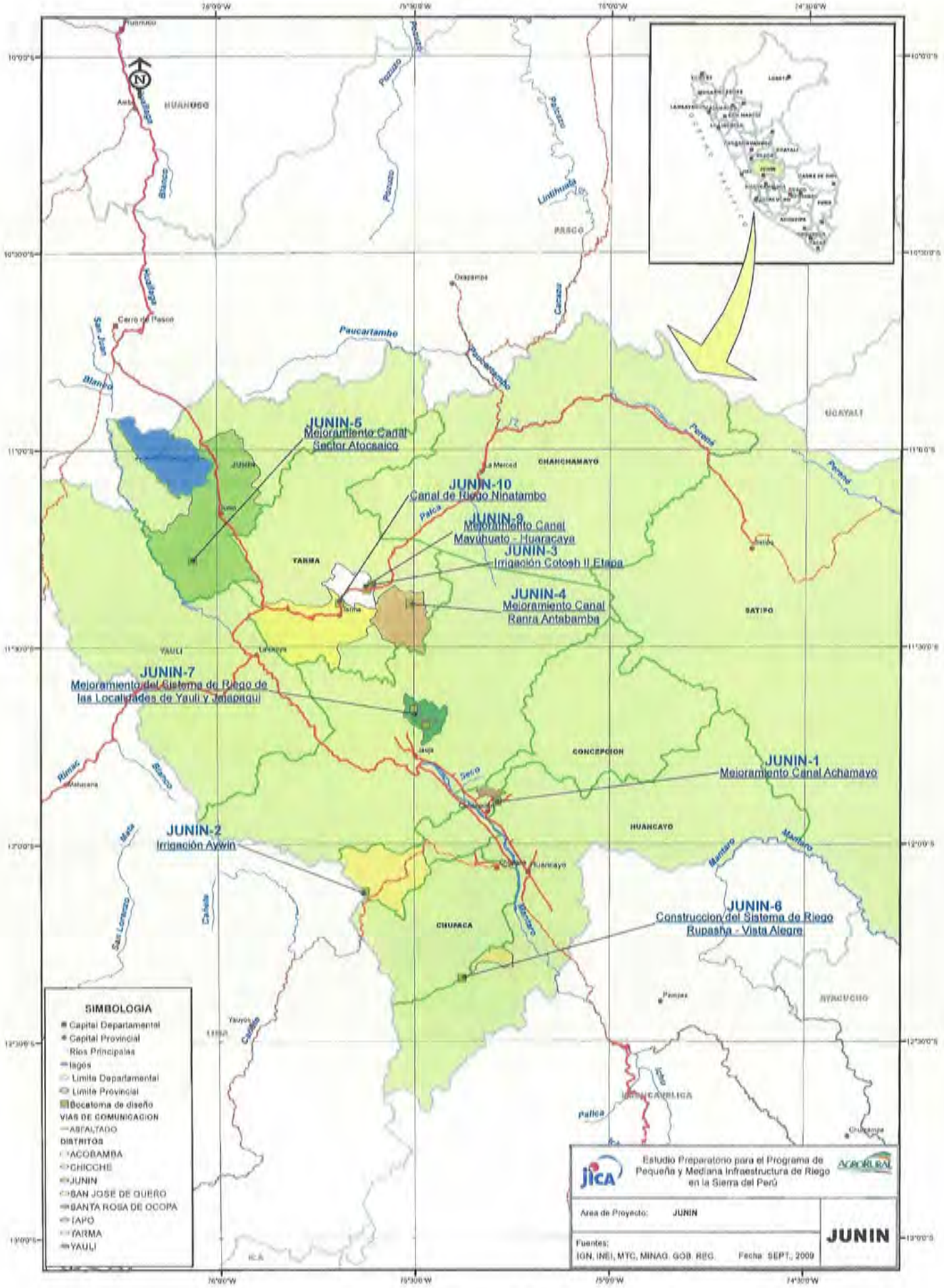
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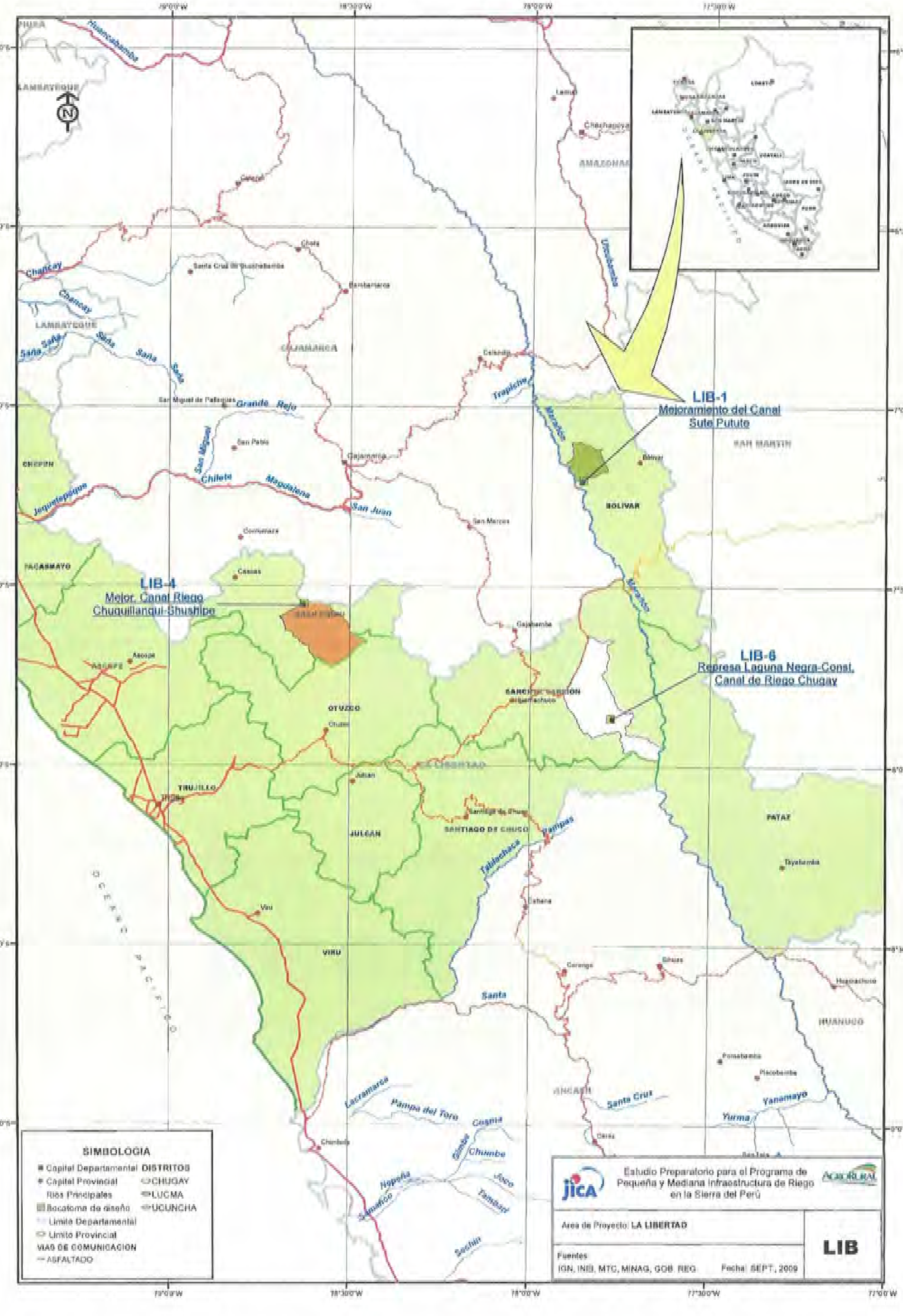

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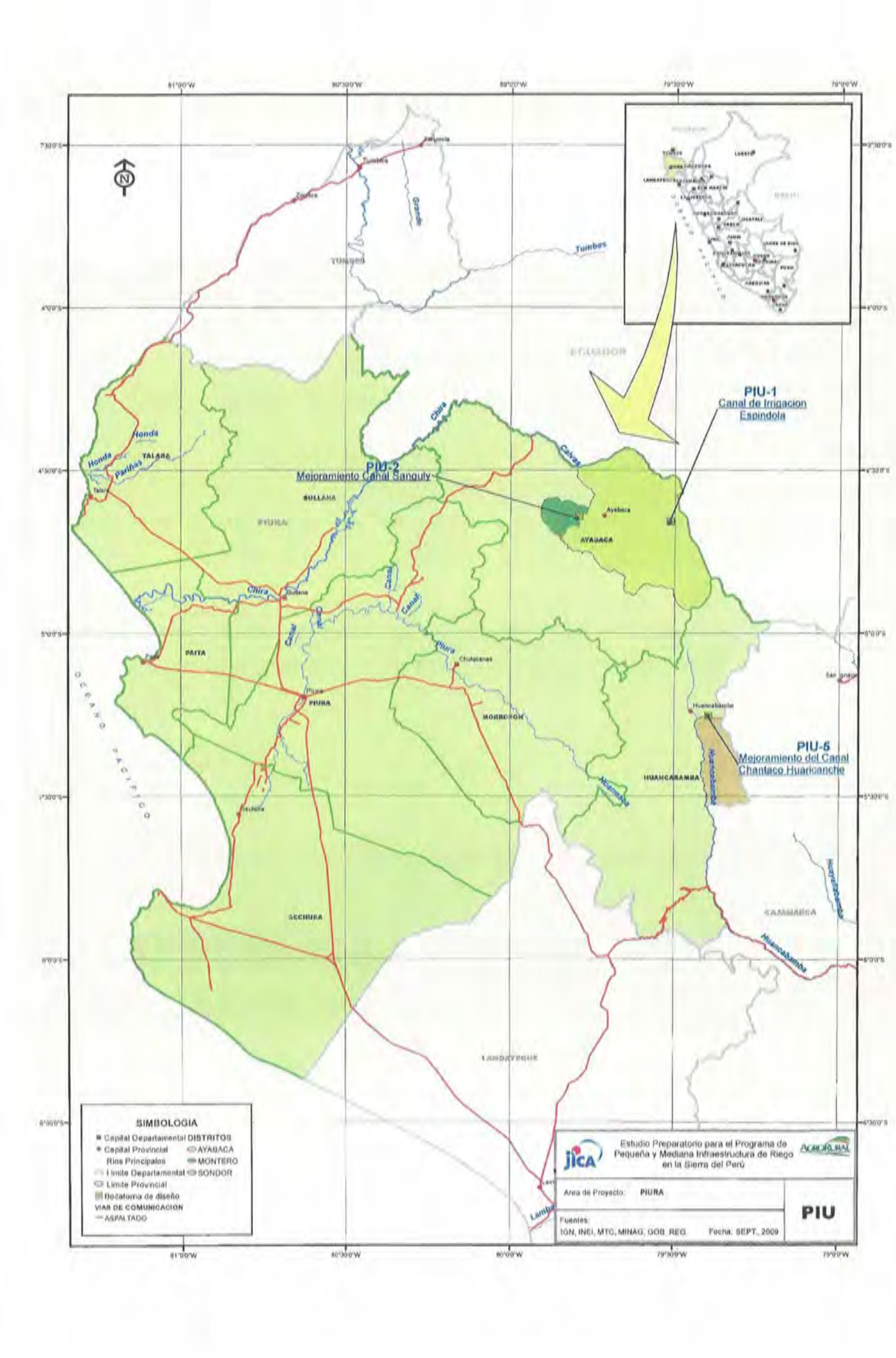
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ABBREVIATIONS/ABREVIATURA

Abreviatura/ Abbreviations		Inglés/ English	Español/ Spanish
Inglés/ English	Español/ Spanish		
	ADEX	The Exporters Association	Asociación de Exportadores del Perú
	ANP	Natural Protection Area	Áreas Naturales Protegidas
	ANPE	National Association of Ecological Producers of Peru	Asociación Nacional de Productores Ecológicos del Perú
	ANA	National Authorization of Water	Autoridad Nacional del Agua
	ALADI	Latin American Integration Association	Asociación Latinoamericana de Integración
	ALIADOS	Support Program for Rural Alliance and Producers in Sierra	Programa de Apoyo a las Alianzas Rurales y Productivas del a Sierra
	ATDR	Technical Administration of Irrigation District	Administración Técnica de Distrito de Riego
CBO		Community Based Organization	Organización de Base comunitaria
	CENAGRO	National Agricultural Census	Censo Nacional Agrario
	DIR	Irrigation Infrastructure Management	Dirección de Infraestructura de Riego
	DGAA	Directorate General of Environmental Affai	Dirección General de Asuntos Ambientales
	DGPM	General Management of Multi-Annual Programming of Public Sector	Dirección General de Programación Multianual del Sector Publico
	DGR	Irrigation Management Caucus	Dirección de Gestión de Riego
	DPIH/PERDEC	Directorate General of Hydraulic Infrastructure/River Channeling and Catchment's Structure Protection Program	Dirección General de Infraestructura Hidráulica / Programa de Encauzamiento de Ríos y Protección de Estructura de Captación
	DRA	Management of Regional Agricultural	Dirección Regional Agricultura
EIA	EIA	Environmental Impact Assessment	Evaluación de Impacto Ambiental
EI	INEI	National Institute of Statistics and Information	Instituto Nacional de Estadística e Informática
	INCAGRO	Competitive Innovation for Peruvian Agro	Innovación y Competitividad para el Agro Peruano
	FAO	Food and Agricultural Organization of the United Nations	Organización de las Naciones Unidas para la agricultura y la alimentación
	FONCODES	Cooperation Fund for Social Development	Fondo de Cooperación para el Desarrollo Social
GIS	SIG	Geographic Information System	Sistema de Información Geográfica
	GL	Local Government	Gobierno Local
	GP	Peruvian Government	Gobierno Peruano
	GR	Regional Government	Gobierno Regional
IBRD	BIRF	International Bank for Reconstruction and Development	Banco Internacional de Reconstrucción y Fomento
IDB	BID	Inter-American Development Bank	Banco Interamericano de Desarrollo
	INCAGRO	Agricultural Extension, Information and Research Project	Proyecto de Información, Investigación y Extensión Agrícola
	INADE	National Institute of Development	Instituto Nacional de Desarrollo
	INGEMMET	Geological Mining and Metallurgical Institute	Instituto Geológico Minero y Metalúrgico

	INIA	National Institute of Agricultural Innovation	Instituto Nacional de Innovación Agraria
	IPROGA	Institute of Water Management Promotion	Instituto de Promoción de Gestión del Agua
	INRENA	National Institute of Natural Resources	Instituto Nacional de Recursos Naturales
	IRH	Management of Water Resources	Intendencia de Recursos Hídricos
JBIC		Japan Bank for International Cooperation	
JICA		Japan International Cooperation Agency	Agencia de Cooperación Internacional del Japón
HDI	IDH	Human Developmental Index	Índice de Desarrollo Humano
	JNUDRP	National board for district irrigation users in Peru	Junta Nacional de Usuarios de los Distritos de Riego del Perú
KfW	KfW	Kreditanstalt fur Wiederaufbau	Instituto de Crédito para la Reconstrucción o Banco de Crédito para la Reconstrucción.
	MARENASS	Project of Natural Resources management in the Southern Sierra	Proyecto de Manejo de los Recursos Naturales en la Sierra Sur
MDGs		United Nations Millennium Development Goals	Objetivos de Desarrollo del Milenio de la ONU
	MEF	Ministry of Economy and Finance	Ministerio de Economía y Finanzas
	MERISS	Improvement of Irrigation in Sierra and Selva	Mejoramiento de Riego en Sierra y Selva
	MIMDES	Ministry of Women and Social Development	Ministerio de la Mujer y Desarrollo Social
	MINAG	Ministry of Agriculture	Ministerio de Agricultura
	MIMA	Intensive Management of Small Watershed	Manejo Intensivo de Microcuencas Altoandinas
	MINAM	Ministry of Envirnement	Ministerio del Ambiente
	MMC	Millon Cubic Meter	Millones de metros cúbicos
	MMM	Multinational Macroeconomic Framework	Marco Macroeconómico Multianual
	MSNM	Meters above Sea Water Level	Metro Sobre Nivel de Mar
NGO	ONG	Non- Governmental Organization	Organización No-Gubernamental
ODA		Official Development Assistance	Asistencia oficial para el Desarrollo
	OGPA	General Office for Agricultural Planning	Oficina General de Planificación Agraria
	OPI	Programming and Investment Office	Oficina de Programación e inversiones
WUA	OUAs	Water Users' Association	Organización de Usuarios de Agua de Riego
GDP	PBI	Gross Domestic Product	Producto Bruto Interno
	PCM	Presidency of the Council of Ministry	Presidencia de Consejo de Ministros
	PEAA	Economically Active Agricultural Population	Población Económicamente Activa Agropecuaria
	PEE	Economic Stimulus Plan	Plan de Estímulo Económico
	PEPMI	Special Project for Plan Meris-Inka	Proyecto Especial Plan Meris-Inka
	PIA	Opening Initial proposal	Presupuesto Inicial de Apertura
	PIM	Institutional Modified Porposal	Presupuesto Institucional Modificado
	PIP	Public Investment Program	Programa Inversión Pública
UNDP	PNUD	United Nations Development Programme	Programa de las Naciones Unidas para el Desarrollo

	PROABONOS	Special Project for Promotion of Utilization of Fertilizers from Seabird	Proyecto Especial de Promoción del Aprovechamiento de Abonos provenientes de Aves Marinas
	PROFODUA	Formalization Program of Water Use' Right	Programa de Formalización del Derecho de Uso de Agua
	PRONAMACHCS	National Program for Watershed Management and Soil Conservation	Programa Nacional de Manejo de Cuencas Hidrográficas y Conservación de Suelos
	PROSAAMER	Assistant Service Program for Access to Rural Market	Programa de Servicios de Apoyo para Acceso a los Mercado Rurales
	PROVIAS	Special Project of Infrastructure of Decentralized Transport	Proyecto Especial de Infraestructura de Transporte Descentralizado
	PSI	Sub-sectorial Program of Irrigation	Programa Subsectorial de Irrigación
PVC		Polyvinyl Chloride	Polivinilo Chloride
	SINANPE	National System of Natural Protected Areas by the State	Sistema Nacional de Áreas Naturales Protegidas por el Estado
	SMGRH	National System of Water Resources Management	Sistema Nacional de Gestión de Recursos Hídricos
	SNIP	National System of Public Investment	Sistema Nacional de Inversión Pública
	SENAMHI	National Service of Meteorology and Hydrology in Peru	Servicio Nacional de Meteorología e Hidrología del Perú
TA		Technical Assistance	Asistencia Técnica
	UIT	Revenue Tax Unit	Unidad Impositiva Tributaria
USAID		United States Agency for International Development	Agencia de los Estados Unidos para el Desarrollo Internacional
WTP		Willing to Pay	Disposición de pago
WUA	JU	Water Users' Association	Junta de usuarios del agua.

PROGRAM OF SMALL AND MEDIUM IRRIGATION INFRASTRUCTURE IN PERUVIAN SIERRA

INTRODUCTION

From the decade of the 90's the concept of sustainable development is incorporated, which according to the definitions of the United Nations Conference on Environment and Development (UNCED): "it is the development fulfilling the present necessities without compromising the capacities of future generations to satisfy their own necessities", adding that sustainable development is "the process of change where the use of resources, direction of investments and the orientation of technological and institutional changes add to the present and future potential to attend human needs and aspirations" (Definition approved in the Rio Summit, 1992)

In this conceptual framework, relation between population, environment and economic growth should be associated to the technological, institutional, social and economic improvements. In order to achieve this situation, three inter-related conditions are necessary: i) economic growth rate higher than population growth rate, allowing improvements in life standards; ii) reduction of poverty, stressing women employment and education; and iii) sensitization of families, communities and economy in general in respect to population growth.[1]

With the present Program, AgroRural wishes to contribute to satisfy the demands of irrigation water of present and future generations in order to satisfy needs in a planning horizon comprising short, medium and long term. In the national sphere, only 30% of agricultural area is under irrigation and 70% has no irrigation, depending on rain that each year are more scarce or more strong, altering the sowing and harvest cycle, so the optimum use of irrigation water is necessary as a way to minimize risks in agricultural activity.

[1] Elsa Galarza: "La Economía de los recursos naturales". Pacific University, First Edition, May 2004

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EXECUTIVE SUMMARY

1. EXECUTIVE SUMMARY

A. Name of the Program

Program of Small and Medium Irrigation Infrastructure in Peruvian Sierra

B. Objective of the Program

The main objective of the project is to "Increase agricultural production of rural families in poverty zones"; that is, with the present program it is intended that organized farmers, increase the levels of agricultural production and productivity in a defined space of the sierra, using irrigation in an efficient and sustainable way.

Scope of the Program

Department	Province	District	Department	Province	District
Amazonas	Bagua	1.Bagua	Cajamarca	Cajabamba	34.Condebamba
	Bagua	2.La Peca		San Miguel	35.San Silvestre de Cochan
	Chachapoyas	3.Balsas		San Pablo	36.Tumbaden
	Utcubamba	4. Bagua Grande		San Pablo	37.San Pablo
	Utcubamba	5.Cajaruro		Santa Cruz	38.Yauyucán
	Utcubamba	6.El Milagro		Santa Cruz	39.Andabamba
Ancash	Aija	7.Aija		Santa Cruz	40.La Esperanza
	Bolognesi	8.Huasta		Santa Cruz	41.Uticyacu
	Bolognesi	9.Aquio	Huancavelica	Huaytará	42. S.A. de Cusicancha
	Bolognesi	10.Pacllòn	Huánuco	Huánuco	43.Quisqui
	C. F. Fitzcarrald	11.San Luis		Yarowilca	44.Aparico Pomares
	Carhuaz	12.Acopampa	Junín	Concepción	45.Concepcion
	Huaylas	13.Caraz		Concepción	46.Sta Rosa de Ocopa
	Mcal.Luzuriaga	14.Llumpa		Concepción	47.S.J. de Quero
	Pomabamba	15.Huayllan		Concepción	48.Nueve de Julio
	Pomabamba	16.Pomabamba		Junin	49.Ondores
	Recuay	17.Recuay		Huancayo	50.Chicche
	Recuay	18.Catac		Chupaca	51.Yanacancha
	Recuay	19.Ticapampa		Tarma	52.Palcamayo
	Sihuas	20.Quiches		Tarma	53.Acobamba
	Sihuas	21.San Juan		Tarma	54.Palca
	Sihuas	22.Chingalpo		Tarma	55.Tarma
	Yungay	23.Ranrahirca		Jauja	56.Yauli
Ayacucho	Huamanga	24.Acocro	La Libertad	Sanchez Carrió	57.Chugay
	Huamanga	25.Chiara		Gran Chimu	58.Lucma
	Huamanga	26.Vinchos		Bolivar	59.Ucuncha
	Cangallo	27.Cangallo	Piura	Ayabaca	60.Ayabaca
	Cangallo	28.Ma Pa de Bellido		Ayabaca	61.Montero
	Cangallo	29.Los Morochucos		Huancabamba	62.Sondor
	Lucanas	30.Puquio			
	Vilcashuaman	31.Concepción			
	V.Fajardo	32.Huancapi			
	V.Fajardo	33.Huancaraylla			

C. Supply and Demand Balance of the Program Goods or Services

The supply and demand balance of the Program has considered the following, for each component:

Component A: Irrigation Infrastructure

There is a deficit of irrigation infrastructure attention at national level and the program has considered 56 irrigation projects in 9 departments and 62 districts.

Table 1.1 Balance of Water Supply

DEPARTMENT	WITHOUT PROJECT			WITH PROJECT		
	Q demand m3/s	**Q Available m3/s**	**BALANCE +/-**	**Q demand m3/s**	**Q Available m3/s**	**BALANCE (+) (-) m3/s**
Amazonas (*)	19.19	6.35	**-12.85**	14.92	15.43	**0.51**
Cajamarca	4.57	0.96	**-3.61**	4.15	4.20	**0.05**
Piura(*)	2.11	0.90	**-1.21**	1.72	1.72	**0.01**
La Libertad	1.95	0.10	**-1.85**	1.95	1.95	**0.00**
Ancash	7.17	0.92	**-6.25**	5.92	5.92	**0.00**
Huánuco	0.44	0.00	**-0.44**	0.44	0.50	**0.06**
Junín	4.58	1.46	**-3.12**	3.69	3.71	**0.02**
Huancavelica	0.18	0.06	**-0.12**	0.18	0.20	**0.01**
Ayacucho	3.14	0.02	**-3.12**	2.55	2.58	**0.03**
TOTAL	**43.33**	**10.76**	**-32.57**	**35.52**	**36.21**	**0.69**

Component B : Strengthening of Water Resources Management in Microwatersheds

There is a demand to carry out interventions of water resources management in the country according to the demand and supply analysis of the component in the departments where Component A projects is located, with the following balance.

Table 1.2 Balance demand and supply of Water Resources Management Strengthening

Unit of analysis	0	1	2	3	4	5
Projected demand of Studies for the Characterization of Microwatersheds	50	50	50	50	50	50
Estimated supply in the situation without project	50	50	50	50	50	50
Supply Demand Balance	0	0	0	0	0	0
Demand of Committees for Water Resources Management in Microwatersheds	50	50	50	50	50	50
Estimated supply in the situation without project	50	50	50	50	50	50
Balance Supply-Demand of Committees for Water Resources Management in Microwatersheds	0	0	0	0	0	0
Total Supply-Demand Balance	0	0	0	0	0	0

D. Technical Description of the Program

Technical proposal of the selected alternative is the proper utilization and maintenance of water resources in the microwatersheds, considering water as a vital resource for the economy of farmer families settled in the microwatersheds of the poor zones of the country, with the intervention of the present program through AgroRural, national entity with large experience, to achieve the improvement of poor families' life conditions.

The components considered for the program are:

1. Irrigation Infrastructure, to use water properly improving and incorporating new technologies for the efficient use of water in agricultural production. It is conformed by the following activities:

1.1 Detailed Design,

Detailed designs will be grouped in 14 packages, according to the characteristics and complexity of project and executed with resources of the Peruvian State.

Detailed design have character of final studies and should be carried out according to the norms of quality and constructive design, approved by the International Consultant, financed with JICA's loan.

1.2 Infrastructure Works,

Infrastructure works are to be executed by contract with resources of external debt and the national treasure, and the following sub-activities will be conducted:

1.2.1 Construction of Irrigation Works, comprises two clearly defined situations:

a) Improvement irrigation infrastructure (Canals), as objective to increase water conveyance efficiency avoiding loss of water by filtration due to inefficient irrigation infrastructure, jeopardizing agricultural production and the economy of farmers.

b) Construction of irrigation infrastructure (dam, canals) to increase areas of agricultural production with permanent irrigation.

In total, it comprises 56 irrigation projects, grouped in conglomerates of 37 projects with similar characteristics and 19 independent projects.

1.2.2 Environmental Management, this sub-activity considers the mitigation of negative impacts originated in each project of irrigation, the same that will be executed by the construction companies.

1.2.3 General Expenses: this sub-activity considers the entire administrative and technical management for the execution of works and it is part of the constructing company expenses.

1.2.4 Supervision Expenses: this sub-activity is considered for the technical and financial control of the constructing company. For that, one professional for each work has been considered. The professional will have the technical responsibility for the execution of the irrigation project up to the culmination.

1.3 Training:

1.3.1 Conformation of Irrigation Committees, its importance is due to the necessity to organize beneficiaries in irrigation users committees, to carry out water distribution and actions of operation and maintenance of the constructed infrastructure, covering

reparation costs of canals, intakes, etc.

A committee of users is to be conformed for each project and a record of users will be prepared with the identification cards and area under irrigation and other relevant data. Users committees will have at least three authorities: president, treasurer and secretary, democratically elected in general assembly of users. The procedures for the official acknowledgement of the Local Water Administrations, organism belonging to the National Authority of Water (ANA) will be carried out.

1.3.2 Training in Water Management for Operation, Maintenance and Lot Irrigation; with this activity knowledge is expected to be transferred to and users of the Program's projects will be trained in the operation and maintenance of the irrigation infrastructure, assuring the infrastructure works, through the proper use of lateral gates and training in the infrastructure preservation; for that training workshops will be conducted with the distribution of manuals about the issue, these actions will allow the sustainability of the irrigation infrastructure. Likewise, in order to achieve the effective and efficient use of water, users will be trained in irrigation by gravity at lot level, according to the agrological characteristics of soils, gradients and according to the type of crop adopted.

1.3.3 Promotion of Technical Irrigation; it has as purpose to sensitize firstly the farmers about the goodness of technical irrigation as well as to know the operation and maintenance costs, that is achieved only by investing in profitable agricultural products; for that it has been considered that beneficiaries of irrigation works organize themselves to choose who will participate in the practices of technical irrigation promotion at the production areas with technical irrigation, to observe and learn about the installation, operation and maintenance of equipment, also to acquire knowledge about the benefits of the technical irrigation system and take the decision to invest in the implementation of technical irrigation in their lots. For that, we consider informing them about the entities and programs that may finance said implementation.

1.4 Promotion of Associativity for Productivity,

The beneficiaries of the program presently are disorganized or poorly organized. For that, it has been considered organizing them in each irrigation project to be intervened as small and/or medium agricultural producers, to achieve their incorporation in the local market with competitiveness. That is, to participate in the dynamics of marketing with products of better quality and larger quantities.

The considered sub-activities are the following:

1.4.1 Organized and Formalized Producers

This activity will organize and formalize the beneficiaries of each irrigation project through workshops and legalization procedures as well as the election of the Direction Board.

1.4.2 Marketing Studies and Identification of the Productive Chain Weakness,

Study of Productive Chain Identification, this study will benefit previously organized producers, because they will be let know about the results and recommendations to improve the actions to be implemented to strengthen the productive chain of their products.

Marketing Study, the present study will be useful for organized groups to know the

characteristics: to whom and what to sell; in order not to loose their income,

For said activities, local consultants will be contracted with funds of the national treasure (ordinary resources).

1.5 Agricultural Technical Assistance,

Agricultural technical assistance is directed to the beneficiaries whose productive areas are to be incorporated with irrigation, that is for 20,629 ha, farmers will be trained in how to develop agricultural production with irrigation, for that each technician will attend 100 ha and for each 7 technicians there will be one supervisor; this activity will be developed during one year.

Technical assistance is mainly oriented to strengthen good agricultural practices, as the adequate use of authorized fertilizers, improved seeds, and cultural tasks and-post-harvest activities.

1.6 Lateral Canals,

The construction of secondary and/or lateral canals are to be executed by the beneficiaries whose areas to incorporate irrigations are 20,629 ha, for that AGRO RURAL's technical assistance has been considered, through the decentralized offices; the amounts for the execution of canals are to be considered as contribution to the Program's financing.

In conclusion, the activities of this component will establish a sustained agricultural production supported in irrigation committees and producers associations strengthened by technical assistance.

No	Symbol	Subproject Name	MMC	Improvement	New Area	Total
1	AMA-1	Mejoramiento del Sist. Riego Higuerones-San Pedro	UCTUBAMBA	577	202	779
2	AMA-3	Mejoramiento Bocatoma y Canal Limonyacu Bajo	UCTUBAMBA	403	112	515
3	AMA-4	Mejoramiento del Sistema de Riego Utcuchillo - Canal Aventurero	Utcuchillo	401	173	574
4	AMA-5	Mejoramiento del Sistema de Riego Naranjitos - Canal Naranjitos Nº. 02	Naranjitos	514	40	554
5	AMA-9	Mej.Boc.Rev.Tramo Canal Comunal Huarangopampa	Utcubamba	630	140	770
6	AMA-10	Mejoramiento del Sistema de Riego Lumbay Balsas	Jahuay	240	110	350
7	AMA-11	Mejoramiento del Sistema de Riego Naranjos - Canal Naranjos	Naranjos	826	67	893
8	AMA-12	Mejoramiento del Sistema de Riego El Pintor - Canal Abad.	El Pintor	503	74	577
9	AMA-13	Mejoramiento Canal San Roque Watson	COPALLIN	681	190	871
10	AMA-14	Mejoramiento Canal Riego La Peca Baja - Canal Brujopata	LA PECA	269	71	340
11	ANC-12	Mejoramiento Canal Rurec	Rio Orellos	250	550	800
12	AYA-6	Irrigacion Papatapruna – Ccochalla	Chilques	50	445	495
13	AYA-9	Mej y Const. Sistema Riego Putacca Ccatun Pampa	Concepcion	107	293	400
14	HUANCA-3	Irrigación Cusicancha-Huayacundo-Arma-Huaytará.	Rio Tincoc		240	240
15	HUA-1	Construcción Canal de Riego Caracocha	Qda. Ragracancha	8	241	249
16	HUA-2	Construcción Canal de Riego Sogoragra Rondobamba	Qda. Sogopampa	13	387	400
17	JUNIN-1	Mejoramiento Canal Achamayo	CHIA	1,520		1,520
18	LIB-1	Mejoramiento del Canal Sute Putute	Rio Sute		529	529
19	LIB-4	Mejor. Canal Riego Chuquillanqui-Shushipe	Chicama	1,000		1,000
20	PIU-1	Canal de Irrigación Espíndola	Río Espíndola		500	500
21	PIU-5	Mejoramiento Canal Chantaco Huaricanche	Qda Chantaco	707	638	1,345
22	ANC-4	Construcción Canal Rupawasi – Rosamonte	Andaymayo		550	550
23	ANC-19	Sistema de Riego Mancan Aija	Santiago	0	540	540
24	AYA-2	Construcción Sistema de Riego Ccocha-Huayllay	Pacchamayo		439	439
25	JUNIN-2	Irrigación Aywin	Jatun Huasi		400	400

26	LIB-6	Represa Laguna Negra-Const Canal de Riego Chugay	Paccha	300	300	600
27	AMA-8	Mejoramiento del Sistema de Riego Goncha Morerilla - Canal Gonchillo Bajo	Goncha	241	43	284
28	ANC-2	Mejoramiento del Canal de Irrigacion Paron II	Rio Parón	400	110	510
29	ANC-6	Mej. Y Amploacion del Canal de Irrigacion Quishquipachan	Río Chucchun	250	0	250
30	ANC-9	Mejoramiento del Canal de Riego Quinta Toma	Rio Ranrahirca	250	0	250
31	ANC-20	Canal de Irrigación Desembocadero – San Miguel	San Miguel	120	0	120
32	CAJ-6	Construccion Canal La Samana – Ushusqui	Rio Chancay		400	400
33	JUNIN-4	Mejoramiento canal Ranra Antabamba	RANRA	100		100
34	JUNIN-5	Mejoramiento Canal Sector Atocsaico	ATOCSAYCCO	200		200
35	JUNIN-9	Mejoramiento Canal Mayuhuato – Huaracaya	Rio Tarma	160		160
36	JUNIN-10	Canal de Riego Ninatambo	Rio Tarma	115		115
37	PIU-2	Mejoramiento Canal Sanguly	Qda. Los Molinos	500	400	900
		Sub-total		**11,335**	**8,184**	**19,519**
No	**Symbol**	**Subproject Name**	**MMC**	**Improvement**	**New Area**	**Total**
1	CAJ-1	Construcción Canal de Irrigación El Rejo	Jequetepeque		1,510	1,510
2	ANC-11	Construcción Canal Cordillera Negra	Rio Santa		1,300	1,300
3	ANC-5	Construcción Canal de Irrigacion Sol Naciente de San Luis	Rio San Luis		1,066	1,066
4	AYA-1	Construcción y Mejoramiento del Sistema de Riego Cangallo	Pilpicancha	555	105	660
5	AYA-13	Const. Canal y Represa Tintayccocha-Acoro	Ventanillayoc	600	500	1,100
6	AMA-2	Mejor. del Sist. Riego San Juan Marañón-La Papaya	MARANON	1,322	155	1,477
7	AMA-6	Mejoramiento del Sistema de Riego Naranjos - Canal El Tigre	Naranjos	1,052	185	1,237
8	CAJ-2	Rehabilitación Canal El Huayo	Crisnejas	535	893	1,428
9	CAJ-7	Irrigacion Cochán Alto	Llapa		600	600
10	ANC-3	Construcción Canal de Irrigación Casablanca- Jocosbamba – Quiches (Joquillo)	Llama	100	463	563
11	ANC-10	Const. Canal de Riego Aynin-Huasta	Rio Pativilca	25	500	525
12	ANC-16	Const. Sistema de riego Jatun Parco	Rio Achin	40	585	625
13	ANC-17	Mejoramiento Canal Chuayas-Huaycho	Jancapampa	240	410	650
14	ANC-18	Mejoramiento Chinguil – Cruzpampa	Chinguil	120	480	600
15	JUNIN-3	Irrigación Cotosh II Etapa	PALCA	500	601	1,101
16	JUNIN-6	Construccion del Sistema de Riego Rupasha - Vista Alegre	Canipaco	899	382	1,281
17	JUNIN-7	Mejoramiento del Sistema de Riego de las Localidades de Yauli y Jajapaqui	Canipaco	240	210	450
18	AYA-5	Construccion de Presa y Sistema de Riego Chaqllani-Pucapampa	CHOCCUIHUA LLCCA	40	1,000	1,040
19	AYA-12	Const. presa y sistema de riego Chito-Sachabamca y Quishuarcancha, Chiara	TOJIASCCA	500	1,500	2,000
		Sub-total		**6,768**	**12,445**	**19,213**
		Total		**18,103**	**20,629**	**38,732**

2. Strengthening Water Resources Management in Microwatersheds and Organization of Farmers

This component is to be developed in microwatersheds at the irrigation project sites, using water as the vital element for farmers' economy, so Strengthening Water Resources Management in Microwatersheds has been considered important with the objective of preserving and making the proper use of water resources at microwatershed level. All these activities are to be supervised by experts in water resources management.

For that, the following activities have been established:

2.1 Preparation of Detailed Design for the Execution of Component B

This activity is directed to determine the specific costs and actions of each activity for each microwatershed. The same will be executed through consulting services in one single study for the 9 regions considered in the program. To be financed by the national treasure.

2.2 Study of Characterization of Water Resources in the Microwatershed

In this activity it has been considered the conduction of studies by microwatershed to identify the availability of water resources and zones of productive identification; that is it will be a study to allow the analysis of potentialities and weakness of the microwatershed as well as to present conclusions and plans of development at the microwatershed referring to agricultural productivity actions.

2.3 Organizational Strengthening for Water Resources Management

This activity has as characteristic to organize water users at microwatershed level through the following activities:

2.3.1 Awareness rising of water users about the importance of water resources.

2.3.2 Organization and formalization of the committees for water resources management in the microwatershed.

2.3.3 Actions of the committees for water resources management with workshops to train members of the committees for water resources management in activities of water preservation and use, as well as strengthen actions of the committee management for the implementation of future activities.

2.3.4 Monitoring of Water Resources and Climate

This activity is important to evaluate water and climate behavior at the microwatershed because it allows to determine the behavior of water resources (reduction, increase or maintenance), to plan actions in the microwatershed; for that hydrometric stations will be installed in each microwatershed.

Also, automatic meteorological stations will be installed in each microwatershed to identify the agro-climatic variables influencing agricultural production, the same that will be communicated to farmers and so, complement their knowledge with the technical assistance considered in component A of the Program.

2.3.5 Recovering Knowledge

This activity intends to highlight and disseminate the positive results of the committees for water resources management, as well as the dissemination of monitoring and its application in agricultural activities and the presentation of the

management plans of each committee.

3. Management of the Program

Program management is comprised by activities of technical and financial administration of the program; for that the following has been considered.

3.1 Administrative Management and Monitoring

These activities will be in charge of the Coordinating Unit of the Program, responsible for the technical and financial execution of the program to establish the monitoring and follow up of components A and B activities; likewise the conduction of base line studies of the program, intermediate and final evaluation of program impact and auditing actions have been considered.

Also, administrative personnel have been considered for the financial issue of the program.

3.2 International Technical Supervision

International technical consultant will be contracted by the Coordinating Unit of the Program, according to the modality of contract of the loan source JICA; it has the function of supporting advising the coordination unit of the program in the execution of the program's activities.

E. Costs of the Program

Program costs are calculated considering SNIP regulation and investment costs, both at private costs (S/. 238,684,826), and social costs (S/: 172,012,055.38) as shown in the following Charts:

Table 1.3 Investment Costs at Private Prices (S/.)

	ACTIVITY	UNIT	QUANTITY	TOTAL
	COMPONENT A IRRIGATION INFRASTRUCTURE			**174,484,702.09**
I	**DETAILED DESIGN AND STUDIES**	**UNIT**	**56**	2,177,963.00
II	**INFRASTRUCTURE**			**154,055,290.45**
	IRRIGATION WORKS	**UNIT**	**56**	133,189,041.54
	ENVIRONMENT	**UNIT**	**56**	382,563.76
	GENERAL EXPENSES	**UNIT**	**56**	6,719,923.55
	SUPERVISION EXPENSES	**UNIT**	**56**	13,763,761.60
III	**TRAINING**			**2,622,405.38**
	CONFORMATION OF IRRIGATION COMMITTEE	**UNIT**	**56**	63,845.00
	TRAINING IN WATER MANAGEMENT O&M AND LOT IRRIGATION	**UNIT**	**56**	421,594.78
	PROMOTION OF TECHNICAL IRRIGATION	**UNIT**	**56**	2,136,965.60
IV	**PROMOTION OF ASSOCIATIVITY FOR PRODUCTIVITY**			**3,324,071.28**
	ORGANIZED AND FORMALIZED PRODUCERS	**UNIT**	**56**	892,311.28
	STUDY OF MARKETING AND PRODUCTIVE CHAIN	**UNIT**	**56**	2,024,960.00
	SUPERVISOR	**UNIT**	**56**	406,800.00
V	**ASSISTANCE**			**9,149,342.86**
	TECHNICAL ASSISTANCE	**UNIT**	**56**	9,149,342.86
VI	**LATERAL CANALS**			
	LATERAL CANALS	**GLOB**	**1**	3,155,629.12
	COMPONENT B STRENGTHENING WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS			**17,994,250**
I	**DETAILED DESIGN FOR EXECUTION**	**UNIT**	**50**	469,000
II	**CHARACTERIZATION OF WATER RESOURCES IN THE MICROWATERSHED**			**6,603,568**
	- IDENTIFICATION OF WATER RESOURCES AVAILABILITY AND ZONES OF PRODUCTIVE INTENSIFICATION / ANALYSIS OF CONFLICTS	**UNIT**	**50**	6,603,568
III	**WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS COMMITTEE CONFORMED AND STRENGTHENED CONDUCT ACTIONS OF WATER AND PRODUCTIVE MANAGEMENT**			**10,921,682**
	AWARENESS RISING FOR THE MANAGEMENT OF WATER RESOURCES IN MICROWATERSHEDS	**Glob**	**1**	954,655
	ORGANIZATION FOR THE CONFORMATION AND FORMALIZATION OF THE WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS COMMITTEE	**Glob**	**1**	1,356,078
	ACTIONS OF MANAGEMENT OF WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS COMMITTEE	**Glob**	**1**	2,115,446
	EQUIPMENT FOR MONITORING OF WATER RESOURCES AND CLIMATE	**Glob**	**1**	5,141,935
	RECOVERING KNOWLEDGES	**Glob**	**1**	1,353,568
	COMPONENT C			**39,372,540.44**
I	**ADMINISTRATIVE MANAGEMENT AND MONITORING**	**GLOB**	**1**	26,708,844.80
II	**INTERNATIONAL SUPERVISION**	**GLOB**	**1**	12,663,696
	SUBTOTAL			**231,851,492.54**
	CONTINGENCIES			6,833,333.39
	TOTAL COST AT PRIVATE PRICE			**238,684,825.92**
	TOTAL COST AT PRIVATE PRICE IN DOLLARS			**83,165,444.57**
	EXCHANGE RATE S/. 2.87=1 DÓLAR			

Table 1.4 Investment Costs at Social Prices (S/.)

	ACTIVITY	UNIT	QUANTITY	TOTAL
	COMPONENT A IRRIGATION INFRASTRUCTURE			**146,133,397.89**
I	**DETAILED DESIGN AND STUDIES**	**UNIT**	**56**	**1,979,966.36**
II	**INFRASTRUCTURE**			**127,417,849.26**
	IRRIGATION WORKS	**UNIT**	**56**	**108,952,142.26**
	ENVIRONMENT	**UNIT**	**56**	**338,552.00**
	GENERAL EXPENSES	**UNIT**	**56**	**5,946,835.00**
	SUPERVISION EXPENSES	**UNIT**	**56**	**12,180,320.00**
III	**TRAINING**			**2,320,712.73**
	CONFORMATION OF IRRIGATION COMMITTEE	**UNIT**	**56**	**56,500.00**
	TRAINING IN WATER MANAGEMENT O&M AND LOT IRRIGATION	**UNIT**	**56**	**373,092.73**
	PROMOTION OF TECHNICAL IRRIGATION	**UNIT**	**56**	**1,891,120.00**
IV	**PROMOTION OF ASSOCIATIVITY FOR PRODUCTIVITY**			**2,941,656.00**
	ORGANIZED AND FORMALIZED PRODUCERS	**UNIT**	**56**	**789,656.00**
	STUDY OF MARKETING AND PRODUCTIVE CHAIN	**UNIT**	**56**	**1,792,000.00**
	SUPERVISOR	**UNIT**	**56**	**360,000.00**
V	**ASSISTANCE**			**8,317,584.42**
	TECHNICAL ASSISTANCE	**UNIT**	**56**	**8,317,584.42**
VI	**LATERAL CANALS**			
	LATERAL CANALS	**GLOB**	**1**	**3,155,629.12**
	COMPONENT B STRENGTHENING WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS			**16,006,256**
I	**DETAILED DESIGN FOR EXECUTION**	**UNIT**	**50**	**460,558.00**
II	**CHARACTERIZATION OF WATER RESOURCES IN THE MICROWATERSHED**			**6,009,246.49**
	- IDENTIFICATION OF WATER RESOURCES AVAILABILITY AND ZONES OF PRODUCTIVE INTENSIFICATION / ANALYSIS OF CONFLICTS	**UNIT**	**50**	**6,009,246.49**
III	**WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS COMMITTEE CONFORMED AND STRENGTHENED CONDUCT ACTIONS OF WATER AND PRODUCTIVE MANAGEMENT**			**9,536,451.51**
	AWARENESS RISING FOR THE MANAGEMENT OF WATER RESOURCES IN MICROWATERSHEDS	**Glob**	**1**	**845,478.92**
	ORGANIZATION FOR THE CONFORMATION AND FORMALIZATION OF THE WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS COMMITTEE	**Glob**	**1**	**1,217,420.32**
	ACTIONS OF MANAGEMENT OF WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS COMMITTEE	**Glob**	**1**	**1,898,980.81**
	EQUIPMENT FOR MONITORING OF WATER RESOURCES AND CLIMATE	**Glob**	**1**	**4,395,324.97**
	RECOVERING KNOWLEDGES	**Glob**	**1**	**1,179,246.49**
	COMPONENT C			**33,868,475.17**
I	**ADMINISTRATIVE MANAGEMENT AND MONITORING**	**GLOB**	**1**	**22,517,205.93**
II	**INTERNATIONAL SUPERVISION**	**GLOB**	**1**	**11,351,269.24**
	SUBTOTAL			**196,008,129.06**
	CONTINGENCIES			**6,833,333.39**
	TOTAL COST AT PRIVATE PRICE			**202,841,462.45**
	TOTAL COST AT PRIVATE PRICE IN DOLLARS			**70,676,467.75**
	EXCHANGE RATE S/. 2.87=1 DÓLAR			

F. Benefits of the Program

The Program will irrigate 38,732 ha including 75 technical irrigation modules of two hectares each, benefiting 24,849 farmer families distributed in 9 departments, 35 provinces and 62 districts.

With the component irrigation infrastructure the following benefits will be obtained:

a. Water saving in main canals to be lined (increase of 20% to 40% in the efficiency of irrigation water application).

b. Increase of cultivated area in the lot improving 18,073 ha and incorporating new cultivation land in 20,659 ha.

c. Increase land use intensity in the lot, allowing two to three harvests a year.

d. Increase of farmland value with the implementation of new irrigation infrastructure.

e. Organization and association of beneficiaries as producers in agribusiness to compete in markets

f. Knowledge about the application of technical irrigation with productive ends and implementation in their cultivation lots

g. Conformation of Irrigation Committees in each project of the Program

h. Knowledge about the agronomic activities in their productive areas

With the Institutional Strengthening component for Water Management in Microwatersheds, the following benefits will be obtained:

1. Conformation of management committees for the proper use of water

2. Knowledge of proper handling and use of water identifying actors, criteria, objectives, strategies and execution of programs and monitoring to allow a balance between water use, contributing to the environmental sustainability and the economy of the population in the microwatershed.

3. Dissemination of agro-climate information for the security of their agricultural products.

G. Results of the Social Evaluation

According to the characteristics of the program, it corresponds to measure one part of the benefit through the Cost-Benefit method, with indicators of Social Present Social Net Value (SPNV) and the Social Internal Rate of Return IRRS. Money cost at 11%.

The pertinent flows of benefits directly has been obtained from the demand function, which in great measure represents, in figures, the changes of social welfare in the economy as a whole. Results of the social evaluation are as follows:

Table 1.5 Economic Indicators of the Social Evaluation

NPV	IRR	R (B/C)
221,755,855	35.21%	2.36

The evaluation period of the program is 10 years, including 5 years of program components' execution and 5 years of evaluation. Other variables have a horizon foreseen according to the following execution schedule:

Table 1.6 Schedule of the Project

Description	Period
Disbursement period	5 years
Evaluation Horizon	10 years
Execution of the program	5 years

Table 1.7 Implementation Schedule of the Program

	ITEM	YEAR 1				YEAR 2				YEAR 3				YEAR 4				YEAR 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	COMPONENT A																				
1	A. DETAILED DESIGN																				
2	B IRRIGATION INFRASTRUCTURE																				
	IRRIGATION WORKS																				
	TRAINING																				
	PROMOTION OF ASSOCIATIVITY FOR PRODUCTIVITY																				
	TECHNICAL ASSISTANCE																				
	LATERAL CANALS																				
3	C. GENERAL EXPENSES																				
4	D.- SUPERVISION EXPENSES																				
	COMPONENT B																				
1	A. DETAILED DESIGN																				
2	B. CHARACTERIZATION OF WATER RESOURCES IN MICROWATERSHEDS																				
3	C. COMMITTEE OF WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS AND PRODUCERS																				
	PROGRAM MANAGEMENT																				
1	ADMINISTRATION –MONITORING AND SUPERVISION AND STUDIES FOR OF THE PROGRAM																				
2	INTERNATIONAL TECHNICAL SUPERVISION																				
	TOTAL																				

Table 1.8 Disbursement Schedule of the Program

	ITEM	YEARS				
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
1	A. DETAILED DESIGN	2,177,963.00				
	B IRRIGATION INFRASTRUCTURE					
2	IRRIGATION WORKS		40,071,481.59	40,071,481.59	33,392,901.33	20,035,740.80
3	TRAINING		63,845.00	767,568.11	1,279,280.19	511,712.08
4	PROMOTION OF ASSOCIATIVITY FOR PRODUCTIVITY	0.00	0.00	1,095,711.28	2,228,360.00	0.00
5	TECHNICAL ASSISTANCE	0.00	0.00	1,829,868.57	5,489,605.71	1,829,868.57
6	LATERAL CANALS	0.00	0.00	946,688.74	1,893,377.47	315,562.91
7	C. GENERAL EXPENSES	0.00	2,015,977.07	2,015,977.07	1,679,980.89	1,007,988.53
8	D.- SUPERVISION EXPENSES	0.00	4,129,128.48	4,129,128.48	3,440,940.40	2,064,564.24
	COMPONENT B					
1	A. DETAILED DESIGN	469,000.00	0.00	0.00	0.00	0.00
2	B. CHARACTERIZATION OF WATER RESOURCES IN MICROWATERSHEDS	0.00	6,603,567.57	0.00	0.00	0.00
3	C. COMMITTEE OF WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS AND PRODUCERS	0.00	6,096,590.54	1,356,078.38	2,115,445.95	1,353,567.57
	PROGRAM MANAGEMENT					
1	ADMINISTRATION –MONITORING AND SUPERVISION AND STUDIES FOR OF THE PROGRAM	4,006,326.72	5,341,768.96	6,677,211.20	5,875,945.86	4,807,592.06
2	INTERNATIONAL TECHNICAL SUPERVISION	1,899,554.35	2,532,739.13	3,165,923.91	2,786,013.04	2,279,465.22
	CONTINGENCIES	1,366,666.68	1,366,666.68	1,366,666.68	1,366,666.68	1,366,666.68
	TOTAL	9,919,510.74	68,221,765.01	63,422,304.00	61,548,517.51	35,572,728.65

H Sustainability of the Program

The Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra is part of the priority for public policies initiatives of the State, referred to the National Strategies of Rural Development and Food Security that are part of the National Plan to Overcome Poverty.

The sustainability analysis identifies the feasibility of institutional arrangements referring to the conditions that will allow a joint work between the Executing Unit, the cooperation entities and the direct beneficiaries of the program.

In this sense, it should be mentioned that the main and direct participants of the Program are conformed by the following institutions: Cooperation Entity JICA, the Program of Productive Agrarian Development -AGRORURAL, National Authority of Water -ANA, Regional Governments, Local Governments, Water Users Organizations and farmers.

In this line of analysis, AGRORURAL proposes that benefits are kept in the long term, for that, the proposal is supported in: technical validity, economic and financial feasibility, participation of beneficiaries, the contribution of the Program in strengthening the organizations, empowerment of beneficiaries organizations promoted by the Program, the support and

commitment of the National Government assumed to achieve Rural Development and consequently the reduction of the existing poverty level in our country.

In this context, the Executing Unit of the Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra is AGRORURAL, entity that results from the fusion of eight entities among investment programs and projects, acquiring the professional experiences and capacities of the staff.

I. Environmental Impact

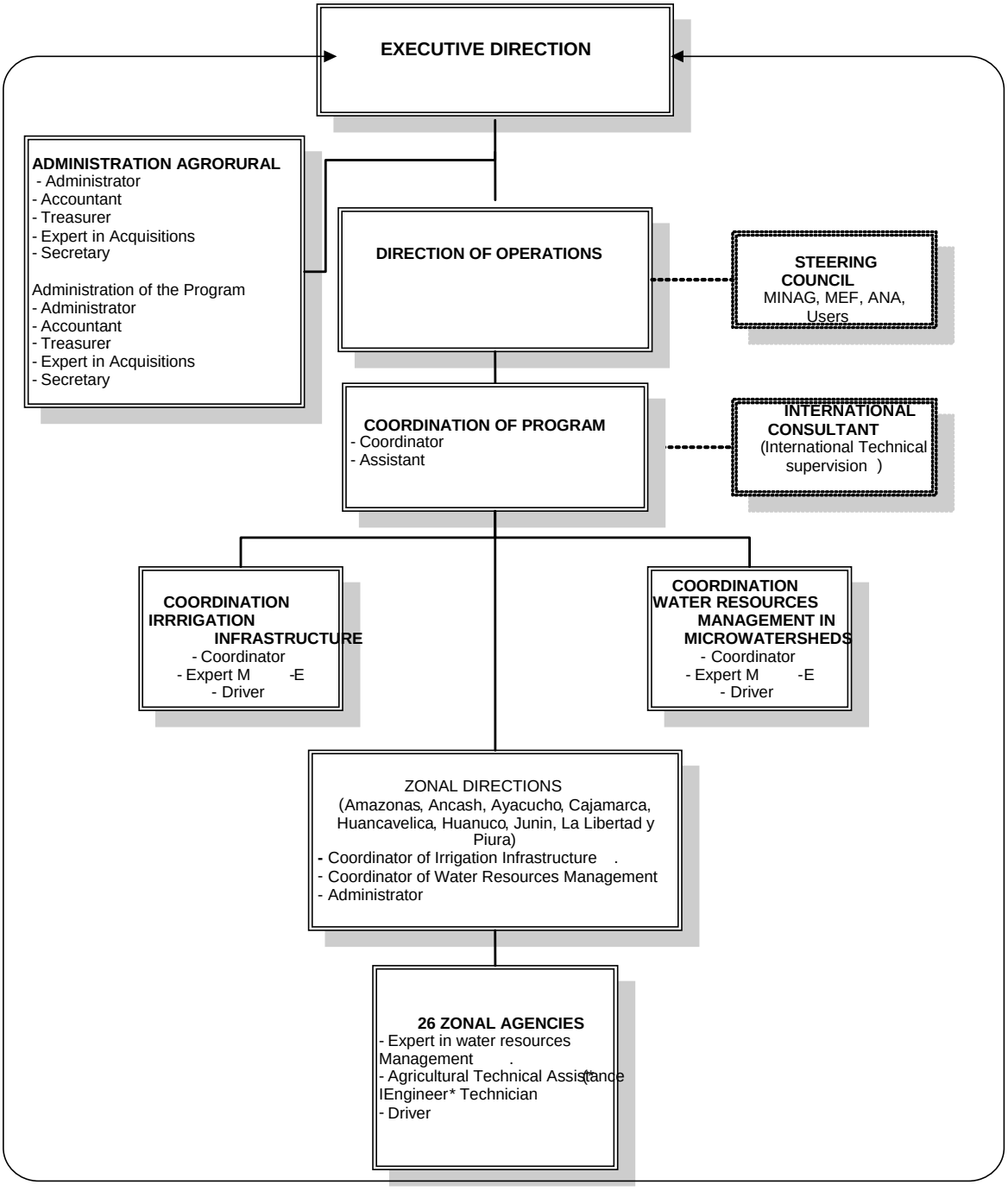
According to Article 8º of Law Nº 27446, Law of National System of Environmental Impact Evaluation and Article 36º of its Regulation, and due to the fact that possible slight environmental impacts were identified in the approved Pre-feasibility study of the Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra, the Proposal for the classification of the Program in Category I has been prepared. The study of Preliminary Evaluation has been formulated, constituted by the Environmental Impact Declaration, the same to be submitted into consideration of the competent authority of the Sector, for its approval and to make it into the Environmental Certification.

J. Organization and Management

The Program has foreseen an ad hoc organization for the investment stage of the conforming projects, besides it counts on with the entire infrastructure of AgroRural and the sub-national governments. The organization for the execution of the Program is described as follows:

1. Steering Council
2. National Coordinator of the Program
3. Responsible in Administration and finances
4. National Coordinators of Irrigation Infrastructure and Management of Water Resources in Microwatersheds
5. Coordinators of Irrigation Infrastructure and Management of Water Resources in Microwatersheds in each Zonal Direction considered in the Program.
6. Experts in Water Resources Management, in technical assistance and promoter in each Zonal Agency considered in the program area.

ORGANIZATIONAL CHART
"SMALL AND MEDIUM IRRIGATION INFRASTRUCTURE IN THE PERUVIAN SIERRA"

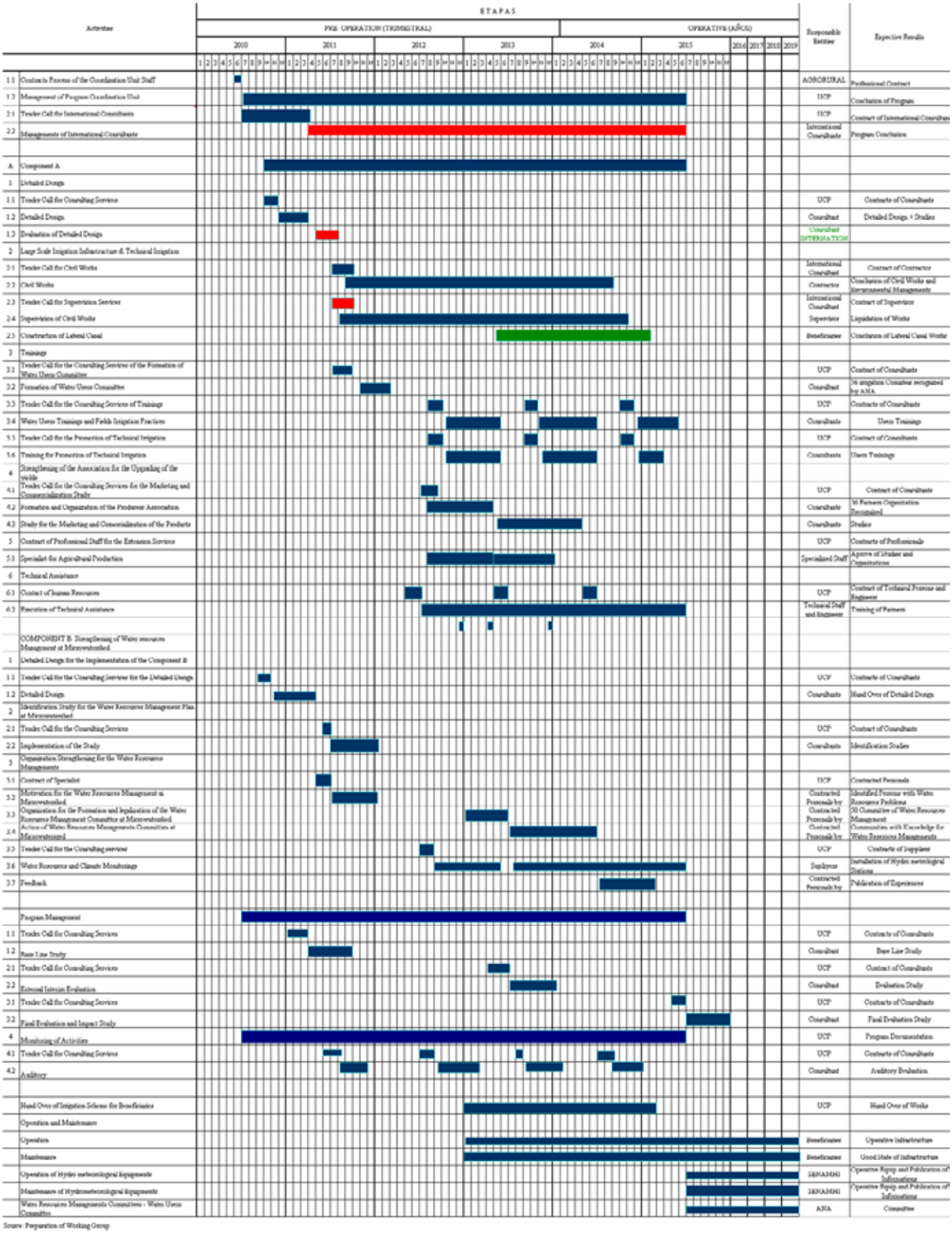


K. Implementation Plan

The Program will be implemented in two stages: pre-operative and operative. The first stage has a duration of five years; corresponding to the execution of all activities foreseen for each one of the Program's components. The second stage refers basically to the operation and maintenance of the Program's projects. The activities by component, plus administration and management expenses of the Program are detailed. It has been considered so that the Coordinating Unit of the

Program technically and financially executes the program with the support of international technical supervision.

Table 1.9 Program Implementation Plan



Source: Preparation of Working Group

L. Financing

The program financing with a total cost of S/. 238`684,826 equivalent to 83`165.445 dollars, is distributed in three financial sources that are:

- External debt through the Japan Bank of the International Cooperation Agency JICA, by an amount of 50`000,000 dollars, representing 60.12%. of the total budget of the program
- Ordinary Resources of the Agriculture Sector through AGRO RURAL of 32`065,922 dollars representing 38.56% of the total budget of the program.
- Beneficiaries with a contribution of 1`099,522 dollars representing 1.32% of the total budget of the program.

Table 1.10 Program Finance Plan

	Activity	Unit	Qty	TOTAL	Percentage	Investments Distribution (S/.)						
						JICA		RO-AGRO-RURAL		BENEFICIARY		
						S/.	%	S/.	%	S/.	%	TOTAL
	COMPONENT A Irrigation Infrastructure			174,484,702	73.10%	124,002,971	71.07%	47,326,102	27.12%	3,155,629	1.81%	174,484,702
I	Detailed Design and Study	Unit	56	2,177,963		0	0.00%	2,177,963	100.00%		0.00%	2,177,963
II	Infrastructure											0
	Irrigation Work	Unit	56	133,189,042		106,468,308	79.94%	26,720,733	20.06%	0	0.00%	133,189,042
	Environments	Unit	56	382,564		321,482	84.03%	61,082	15.97%	0	0.00%	382,564
	General Expenditure	Unit	56	6,719,924		5,646,995	84.03%	1,072,929	15.97%	0	0.00%	6,719,924
	Supervision Expenditure	Unit	56	13,763,762		11,566,186	84.03%	2,197,575	15.97%	0	0.00%	13,763,762
III	Training											0
	Formation of Irrigation Committee	Unit	56	63,845		0	0.00%	63,845	100.00%	0	0.00%	63,845
	Training for Water Use and Irrigation Practices	Unit	56	421,595		0	0.00%	421,595	100.00%	0	0.00%	421,595
	Promotion of Technical Irrigation	Unit	56	2,136,966		0	0.00%	2,136,966	100.00%	0	0.00%	2,136,966
IV	Strenthgning of Association for the Upgrading of Yields											
	Organized and Formalized Farmers	Unit	56	892,311		0	0.00%	892,311	100.00%	0	0.00%	892,311
	Marketing and Productive Chain Study	Unit	56	2,024,960		0	0.00%	2,024,960	100.00%	0	0.00%	2,024,960
	Supervisor	Unit	56	406,800		0	0.00%	406,800	100.00%	0	0.00%	406,800
V	Assistance											
	Technical Assistance	Unit	56	9,149,343		0	0.00%	9,149,343	100.00%		0.00%	9,149,343
VI	Lateral Canals											
	Lateral Canals	Ls	1	3,155,629		0	0.00%	0	0.00%	3,155,629	100.00%	3,155,629
	COMPONENT B Strenthgning of Water Resources Management at Micro Wathershed			17,994,250	7.54%	0	0.00%	17,994,250	100.00%	0	0.00%	17,994,250
I	Detailed Design for Implementation	Unit	50	469,000		0	0.00%	469,000	100.00%		0.00%	469,000
II	Identification of Water Resources at											0
	Identification of Water Resources Potentiality, Land Use Plan and Conflicts Analysis	Unit	50	6,603,568		0	0.00%	6,603,568	100.00%		0.00%	6,603,568
III	Water Resources Management Committee and Strengthening of Water Resources Management											0
	Motivation of Water Resources Managements at Micro watershed	Ls	1	954,655		0	0.00%	954,655	100.00%		0.00%	954,655
	Organization for the Formation and Formalization of Water Resources Managements at Micro Watershed	Ls	1	1,356,078		0	0.00%	1,356,078	100.00%		0.00%	1,356,078
	Action of Water Resources Managements at Microwatershed	Ls	1	2,115,446		0	0.00%	2,115,446	100.00%		0.00%	2,115,446
	Monitoring Equipment for the Hydro Climatologically Stations	Ls	1	5,141,935		0	0.00%	5,141,935	100.00%		0.00%	5,141,935
	Feed Back	Ls	1	1,353,568				1,353,568	100.00%		0.00%	1,353,568
	COMPONENT C			39,372,540	16.50%	12,663,696	32.16%	26,708,845	67.84%	0	0.00%	39,372,540
I	Administration and Monitoring Management	Ls	1	26,708,845			0.00%	26,708,845	100.00%		0.00%	26,708,845
II	International Supervision	Ls	1	12,663,696		12,663,696	100.00%		0.00%		0.00%	12,663,696
	SUBTOTAL			231,851,493		136,666,667	58.95%	92,029,196	39.69%	3,155,629	1.36%	231,851,493
	Contingency			6,833,333	2.86%	6,833,333	100.00%	0	0.00%		0.00%	6,833,333
	TOTAL COST			238,684,826	100.00%	143,500,000	60.12%	92,029,196.42	38.56%	3,155,629	1.32%	238,684,826
	TOTAL COST (US$)			83,165,445	100.00%	50,000,000	60.12%	32,065,922	38.56%	1,099,522	1.32%	83,165,445

Exchange Rates S/. 2.87=1 US$

M. Conclusions and Recommendations

- The Program meets the most desired necessities of farmers, their direction and the

sub-national government authorities.

- The execution of irrigation infrastructure and the preservation of water resources is part of the State policy.

- It is recommended to approve the present program and to promptly start its implementation.

N. Logical Framework

OBJECTIVES	GOALS	INDICATOR	VERIFICATION MEANS	ASSUMPTIONS
END Contribute to improve the life level of rural families in poverty zones lacking water	… …	…	…	…
PURPOSE Increase agricultural production of rural families in poverty zones	By the end of the Program: -Improvement of 18,103 hectares of cultivation areas with irrigation. -Incorporation of 20,659 hectares to cultivation. -Favored production increase in average 44%	-Area improved with irrigation each semester. -Percentage of average increase of production annually	-Annual Operative Plans. -Annual Reports. -Mid-term evaluation	No presence of catastrophic climate phenomena
COMPONENTS C1.- The zones of agrarian and rural poverty have improved their availability of water resources for cultivations as organized farmers to generate innovations and a better destination for their production	By the end of the Program: -Achieve the increase water availability through construction of Infrastructure of Irrigation with 56 works. -Capacities of 56 groups of beneficiaries of works, organized in irrigation committees and trained for the system O&M	-Nº of hectares improved with Irrigation by semester. -Nº of hectares incorporated with Irrigation by semester. -No. of farmers sensitized and with experiences in the advantages of technical irrigation - -Nº of users organizations acknowledged by semesters -Nº of semester producers who improved the operation capacity of their irrigation systems. -Nº of water user organizations improved as organized producers..	- Operative Plans of PIP - Monitoring reports	Beneficiaries maintain their attitudes and good will to participate in the Program
C2.- Rural Families and local actors have improved their capacities to participate in the water resources Management at Microwatershed level and generate sustainability in water conservation	By the end of the Program: -Water resources management institutionalized at the level of 50 Andean Microwatershed. -There are 50 Studies of Microwatersheds characterizations for decision making in relation to water resources Conservation and management -	-Nº of water management committees at Microwatershed level conformed and legalized. -Nº of committees conformed conducting water management actions at the entire Microwatershed level. -Nº of Basic meteorological stations installed and in operation.	- Monitoring Reports - Management reports - Monthly and mid-year reports - Annual reports	There is no presence of catastrophic phenomena to affect the progress of the Program implementation and Works execution
C3.- Management, Coordination, Supervision, Monitoring and Evaluation of the Program	By the end of the Program: - 20 Quarterly reports of execution progress prepared. - 5 annual reports of execution progress have been prepared. -01 Base line Study -01 Study of intermediate evaluation. etc.	-Nº of quarterly reports of program execution management. -Nº of annual reports of program execution management. - Evaluation studies.	- Mid-term evaluation	

ACTIVITIES				
1.1 Presentation of the Program and Call to the Authorities, Local Organizations and Actors	COST OF COMPONENT A S/. 174`484,702 Considered for 56 irrigation works of 56 irrigation committees, minimum of 56 organizations of producers to receive technical assistance for each project of this component COST OF COMPONENT B S/. 17,994,260 Considers the organization of 50 committees of water resources management ADMINISTRATION AND MONITORING OF THE PROGRAM S/. 39,372,540.00 Considered in the technical-financial administration by the Coordinating Unit of the Program and international technical supervision. Contingencies S/. 6,833,333 The Total Investment of the program to improve living conditions of 24,849 families is S/. 238,684,826 Investment corresponds to US$ 83,165,445; ÙS$ 50,000,000 is financed through public loan to JICA, US$ 32,065,922 through national treasure, and US$ 1,099,522 by beneficiaries Execution period : 5 years			
1.2 Actions of Promotion, sensitization and commitments in the scope of Intervention.				
1.3 Confection List of Work for Bidding and Schedule				
1.4 National Bidding for Works construction				
1.5 Execution of Irrigation Infrastructure Works				
1-6. Training, live experiences, formation of organizations and formalization				
2.1 Workshops of Sensitization, Identification, Participation and Commitments in the scopes of the Program				
2.2 Training in Organization and Legalization of Water Management Committees of Microwatersheds.				
3.1 Call of Personnel to complete the executing unit				
3.2 Implementation of the executing unit				
3.3 Start of the Investment Program Execution				

CHAPTER 2
GENERAL ASPECTS

2. GENERAL ASPECTS

2.1 Name of the Program

Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra

2.2 Formulating and Executing Unit

Formulating Unit

Name : AgroRural

Person in Charge : Eco. Carlos Herrera Santibañez

Executing Unit

Name : AgroRural

Person in Charge : Arq. Rodolfo Beltrán Bravo

The Program Executing Unit of Investment is AGRO RURAL, through the zonal agencies, whose experience in the execution of irrigation facilities projects is supported in already executed projects and in microwatersheds management activities.

AGRO RURAL Zonal Agencies count on with a permanent presence in the area and are fully identified with the Communities' problems, being the main institution of the sector and the State to carry out activities of agricultural development in the sphere of provinces and districts of the 9 departments of the Program.

2.3 Participation of Concerned Agencies and Beneficiaries

There are many institutions and organizations involved in the execution of the present Program, for water use for irrigation purposes is subject to many interested groups that in some way, directly or indirectly, contribute to the achievement of the Program and have influence in the several projects cycles conforming it. Following a matrix of participation of the concerned entities is shown.

Matrix of concerned entities in the PPMIR

Groups of interest	Main interests of the group	Effects of the Project in the performance	Importance for the success of the project	Level of influence on the project
Regional Governments	Support the execution of the irrigation infrastructure Program and in the definition of agricultural resources potentialities in the Region	Positive: strengthening of institutional management of water tariff for irrigation. Participation is formalized through agreements and/or strategic alliances.	High	Medium
Local Governments	Allow sustainable agricultural activities related to the economic zoning and territorial ordainment.	Positive: knowledge of the potential of resources and its sustainable use. Participation is formalized through agreements	High	High

Peasants Communities	Acquire knowledge on the infrastructure management and efficiency in the use of irrigation water and the development of their agricultural activities allowing its sustainable use	Positive: reorients extensive agriculture towards intensive development and the efficient promotion and management of irrigation water. Participate in the project cycle and is responsible for the infrastructure operation and maintenance. Its participation and commitments are formalized in assembly minutes.	High	High
AGRORURAL	Formulates and implements the PIP in the national territory. Provides technical assistance in irrigation water management and is articulated in the management with the committees at microwatersheds level and the micro agribusiness	Positive: provides the articulation of the several components in the efficient management of irrigation water with an approach of microwatersheds and the market management.	High	High
MINAG	Dictates the policies and regulations of sector intervention. Review and approves the PIP. Provide institutional technical assistance.	Positive: allows and promote competitiveness in agriculture with a territorial approach. Guide agricultural activities and consolidates the national agriculture statistics.	High	High
ANA	Coordination of activities with the National Authority of Water (ANA)	Positive: sign agreements for the articulation of activities with Local Water Authorities and the Microwatersheds Management Committees.	High	High
MEF	Regulates the State investment policies. Approves, evaluates and transfers public resources for goods and services of the nation.	Positive: implement the State policies in budgetary issues. Define pre –investment and investments of public resources	High	High
Ministry of Environment	Watch over the sustainable use of water resources as condition for a proper environmental management	Positive: strengthening of activities to achieve the balance in the use of water resources for the present and future necessities of human beings	High	Low
Mining Companies	Contribute to conserve water resources through the complementation of actions carried out by the State in the watersheds management and greater participation in the proper use and management of water	Positive: improve and manage efficiently the use of water in the influence area of the mining center. Formalization through strategic alliances and agreements.	High	High
Direct Beneficiaries organized in committees of users or users boards	Empowerment in the effective management of irrigation water at lot level and dynamic participation in the microwatersheds management committees and actual participation in the Identification of alternative and innovative activities to obtain competitive results with the use of water and the possibility of sustainable rural development	Positive: development of opportunities to increase agricultural activities and the generation of local jobs due to the permanent availability of irrigation water and reduction of irrigations in crop productivity. Actively participate in the operation and maintenance stage of the irrigation infrastructure. Their participation and agreements are formalized in assembly minutes.	High	High
Japan International Cooperation Agency (JICA)	Transfer of loan resources for the sustainable development and management of natural resources	Positive, Partial financing of economic resources for the program	High	Low

2.4 Framework of reference

2.4.1 Summary of the main antecedents of the Program

Peruvian Government, aware of the role of agriculture in the national development has been very concerned with the serious problem of water deficit in the sierra and other places of the country, due mainly to the seasonality of rainfall, that in most cases allow only subsistence agriculture practices with cultivation in rain fed areas and only one harvest per year, for most land proper for cultivation cannot be worked for lack of water in the dry season (approximately 8 months per year).

At the end of the decade of 70', programs to promote irrigation in the country were created: "Línea Global" (Global Line); then the Program of Small and Medium Irrigation PEPMI and later the PLAN MERISS as Plan of Small and Medium Irrigation in Peruvian Sierra and Selva whose activities and projects were focused in three departments: Cajamarca, Junín and Cusco, but unfortunately during the decade of the 80 the projects were closed, excepting the one located in the department of Cusco, that thanks to the capacity granted to look for financing sources, including overseas, could go on and subsist with the technical and financial cooperation of the German Government through the KFW (Kreditanstal Fur Widerafbau), that expanded actions to the department of Apurímac. Unfortunately, in the rest of the country, the activity of irrigation infrastructure construction and improvement was practically abandoned and only at the second half of the second decade of the past century, the initiative to execute irrigation projects in the Sierra and other regions was taken again through entities such as FONCODES and PRONAMACHCS.

The Program under Study has its origins in PRONAMACHCS, entity integrated by AGRO RURAL since March 2009, intervening in the whole country. Following, the most important steps for its development from April 2006 are listed.

a) On April 28, 2006, the General Manager of PRONAMACHCS, by official letter Nª 464.2006-AG-PRONAMACHCS-GG/GPLAN sends to the Director of the General Office of Agriculture Planning of MINAG the project: "Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra"; pre-investment study at perfil level, requesting opinion and procedures,

b) On May 25, the Director of the General Office of Agriculture Planning (OGPA), by official letter Nª 2058-2006-AG-OGPA-OI- communicates to the General Manager of PRONAMACHCS that the perfil of the "Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra"; has been evaluated and approved by the OGPA, through technical report Nª 124-2006-AG-OGPA/OI recommending the elaboration of Pre-feasibility studies.

c) On June 5, 2006 the Ministry of Agriculture sends an official letter Nª 297-2006-AG-DM to the Ministry of Economy and Finance requesting the opinion of the National Direction of Multi-annual Programming (DGPM) and the start of negotiations of the Loan Contract with the World Bank.

d) On August 1, 2006, the General Director of the Public Sector Multiannual Programming sends to the General Direction of Public Debts the report Nª 127-2006-EF/68.01 with its opinion on respect to the initiation of negotiations for the financing of the Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra.

e) In its report, the General Direction of Public Debts expresses that "it considers

necessary more information to start financing negotiations, recommending to start the same once the pre-feasibility study is approved, or the observations described in the technical report Nª 127-2006-EF/68.01 are solved" attached to the memorandum.

f) By official letter Nª 336-2007-AG-DM of May 24, 2007, MINAG reiterated to the MEF its request to start negotiations of external indebtedness to finance the Program, in this opportunity, negotiations with JBIC, attaching an improved version of the Program study.

g) By Memorandum Nª 259-2007-EF/75.22, dated June 4, 2007, the General Direction of Public Debts once again requested the opinion of the National Direction of Multi-annual Programming.

h) The DGPM of MEF issues a technical report Nª 104-2007-EF/68.01 dated August 1, 2007 pointing out that "after review, analysis and evaluation of the "Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra"; it can be observed that the same has not attended all observations and recommendations expressed in the Technical Report Nª 127-2006-EF/68.01, reiterating thus, the opinion that before starting the financing negotiations the pre-feasibility study for the present program should be carried out.

i) The same technical report "recommends component 3 (training and technical assistance to irrigation users), to be submitted not as a separate component because its actions directly complement the actions of components 1 and 2 (irrigation infrastructure and technical irrigation, respectively). Integrating it to the mentioned components, the adequate operation and maintenance of the infrastructure to be developed can be assured". From that point AGRORURAL and OPI-MINAG limited the program to only three components, being the third the Institutional Reinforcement for Watershed Basin Management.

j) On November 24, 2008, the Ministry of Agriculture of Peru, the General Manager of PRONAMACHCS and the Resident representative of JICA Peru, sign a Minute of Discussion about the implementation of the Preparatory Survey for the "Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra"

k) The Japan International Cooperation Agency, JICA, trough a process of selection assigned the elaboration of the study to the Consulting company Nippon Koei (hereinafter the Consultant), awarded with the tender process.

l) The Consultant starts its works in Peru on March 2009, submitting the Inception Report that is soon discussed with the Peruvian Counterpart PRONAMACHCS (hereinafter AGRORURAL), adding a set of recommendations made by the counterpart institution. Said report contains the approach and methodology for the conduction of the study.

m) Through technical report Nº 156-2009-EF/68.01, of Dec. 15, 2009; the National Direction of Multi-annual Programming of Public Sector (DGPM), after analyzing and evaluating the pre-investment study at pre-feasibility level of the Program "Small and medium irrigation infrastructure in the Peruvian sierra", authorizes the elaboration of the Feasibility Study, under code PROG-14-2006-SNIP.

n) Presently AGRO RURAL, through the Executive Direction has send instructions to the respective Zonal Directions, to proceed in coordination with local governments and direct actors, to update and/or formulate, as corresponds, the projects profiles part of the present Program, which are evaluated by the Planning Office.

2.4.2 Guidelines of Sector and Function Policies

The guidelines for development policies and the environmental reality give priority to the sustainable use of natural resources and the integral risk management, mainly the integrated handling of watersheds under communitarian management. It also gives priority to the process of decentralized public management policy as well as the strengthening and effort of the central, regional and local governments and the grassroots organizations management capacities.

The present development program constitutes a socioeconomic alternative, as a contribution to the improvement of life quality of direct and indirect beneficiaries settled in distinct districts and provinces in the departments of Amazonas, Cajamarca, Piura, La Libertad, Ancash, Huanuco, Junín, Huancavelica and Ayacucho, so it is framed in all sector policies being implemented in the country, area of the program intervention.

The policy guidelines of the Agriculture Sector, the policy guidelines of Strategies for Rural Development and the National Plan to Overcome Poverty and the National Strategy for Food Security 2004-2015; point out mainly to increase competitiveness and productivity of agricultural producers, generate more opportunities to accede to external markets, develop a platform of agricultural services in sanitation, land registration, research and technical assistance, information and training. Moreover, it aims to promote the development and modernization of entrepreneurial management of producers organized in productive chains. MINAG is responsible for the implementation of the National Strategy of Rural Development and Food Security.

For the present and following years, the priority guidelines of the sector are: improve sustainable management and use of water and soil resources, and assure their conservation; promote the reduction of negative environmental impacts with the execution of activities and projects in the rural area and promote territorial ordainment through the integrated management of watersheds and recovery of degraded environments.

The Program is framed in two of the six axis proposed in the document Multi-annual Strategic Plan 2007-2011 of the Ministry of Agriculture1:

Strategic axis Water Management, in the Specific Objectives:

- Increase efficiency of water management and the sustainable use of water resources.
- Strengthen the conservation and sustainable use of water, soil and forest resources in the hydrographic watersheds.

Strategic Axis Rural Development, in the Specific Objectives:

- Focus the intervention of agrarian public sector in poverty zones, mainly in the Sierra and low Selva under a territorial and multi-sector approach.
- Promote the sustainable management of natural resources.
- Develop instruments and projects of natural resources use with economic purposes in zones of rural poverty.
- Promote the recovery of Andean meadows.
- Contribute to improve the management capacity of Regional and local Governments in rural development issues.

Also, the program will contribute to the Policy Axis 1 of the Ministry of Environment, of

[1] MINAG: Homepage www.minag.gob.pe

compulsory binding by the national, regional and local governments, in relation to Conservation and Sustainable Use of Natural Resources and the Biological Diversity:

- Promote the systemic axis and sustainable management of biological diversity as transversal element in the natural resources management plans;
- Promote the integrated watersheds management, with eco-systemic approach for the sustainable management of water resources, in accordance to the policy of territorial ordainment and ecological and economic zoning;
- Promote territorial ordainment as the base of concerted development plans in the hydrographic watershed management.

According to the legislation in force, regional governments are obliged to formulate the respective documents of strategic planning as well as the formulation of the participative budgets, and as it is natural, in these documents water is a priority for it constitutes one of the greater necessities of the population, and in the case of the rural sector, irrigation water is not only a problem of urgent solution but also the construction of proper irrigation infrastructure and the improvement of the existing ones, with the purpose making them more efficient and effective.

Finally, the program is also framed in the local context, oriented to improve the living conditions of the population of provinces and districts at the interior of the departments, area of the program; aiming to satisfy the basic needs of our population.

2.4.3 Priority of the Program Execution

By the priority assigned in the mission, vision and operative plan of the recent created AGRORUAL, and in the concerted strategic plans of the regional and local governments to jointly carry out, the fight against poverty of our population in the rural area and the reducing the degradation of our renewable natural resources and the proper use and management of water resources, mainly for consumption in agricultural activities, the present program is a priority.

It corresponds to the sector as a whole to start, once and for all, the execution of long range programs and projects with high profitability, as a way to counteract against the economic problems and the financial crisis at world scale that could affect our country, the execution of the referred program will lead to the generation of temporary and permanent jobs in the rural areas, and the reduction of the migration from the rural area to the cities.

The execution, in charge of the zonal directions and agencies of AGRORURAL; is guaranteed by the professional experience earned and the existing logistic support. Besides, an organization of the Program intervention has been formulated, described in the corresponding item.

2.5. Diagnosis of the present situation

2.5.1 Political Scope of the Program

The program is politically located in 9 Regions, 36 provinces and 62 districts, detailed in Table N° 2.5-1.

Table 2.5-1 Political Scope of the Program

Department	Province	District	Department	Province	District
Amazonas	Bagua	1.Bagua	Cajamarca	Cajabamba	34.Condebamba
	Bagua	2.La Peca		San Miguel	35.San Silvestre de Cochan
	Chachapoyas	3.Balsas		San Pablo	36.Tumbaden
	Utcubamba	4. Bagua Grande		San Pablo	37.San Pablo
	Utcubamba	5.Cajaruro		Santa Cruz	38.Yauyucán
	Utcubamba	6.El Milagro		Santa Cruz	39.Andabamba
Ancash	Aija	7.Aija		Santa Cruz	40.La Esperanza
	Bolognesi	8.Huasta		Santa Cruz	41.Uticyacu
	Bolognesi	9.Aquio	Huancavelica	Huaytará	42. S.A. de Cusicancha
	Bolognesi	10.Pacllòn	Huánuco	Huánuco	43.Quisqui
	C. F. Fitzcarrald	11.San Luis		Yarowilca	44.Aparico Pomares
	Carhuaz	12.Acopampa	Junín	Concepción	45.Concepcion
	Huaylas	13.Caraz		Concepción	46.Sta Rosa de Ocopa
	Mcal.Luzuriaga	14.Llumpa		Concepción	47.S.J. de Quero
	Pomabamba	15.Huayllan		Concepción	48.Nueve de Julio
	Pomabamba	16.Pomabamba		Junin	49.Ondores
	Recuay	17.Recuay		Huancayo	50.Chicche
	Recuay	18.Catac		Chupaca	51.Yanacancha
	Recuay	19.Ticapampa		Tarma	52.Palcamayo
	Sihuas	20.Quiches		Tarma	53.Acobamba
	Sihuas	21.San Juan		Tarma	54.Palca
	Sihuas	22.Chingalpo		Tarma	55.Tarma
	Yungay	23.Ranrahirca		Jauja	56.Yauli
Ayacucho	Huamanga	24.Acocro	La Libertad	Sanchez Carrió	57.Chugay
	Huamanga	25.Chiara		Gran Chimu	58.Lucma
	Huamanga	26.Vinchos		Bolivar	59.Ucuncha
	Cangallo	27.Cangallo	Piura	Ayabaca	60.Ayabaca
	Cangallo	28.Ma Pa de Bellido		Ayabaca	61.Montero
	Cangallo	29.Los Morochucos		Huancabamba	62.Sondor
	Lucanas	30.Puquio			
	Vilcashuaman	31.Concepción			
	V.Fajardo	32.Huancapi			
	V.Fajardo	33.Huancaraylla			

2.5.2 Causes for the existing situation

Presently four direct causes and eight indirect causes have been identified, the same that are described as follows:

1. Insufficient level of management to avoid progressive loss of natural conditions for catchments, infiltration and storage of water in water recharge zones in the Andean microwatersheds. This direct cause in its turn is divided in the following indirect causes:

1.1. Poor organization of the microwatershed actors in water resources management, water users are not organized because they only use the resource, without planning

or distributing it with equity or considering it as an added value to agriculture, human consumption, etc.

1.2. Poor information for public and private intervention at microwatershed level, due to the lack of microwatershed characterization studies to determine the origins of water resources shortage in the High-Andean microwatersheds.

2. Poor water conveyance infrastructure to provide for rural and agricultural productive activities. Two indirect causes have been identified:

2.1 Water sources far from the cultivation areas.
2.2 Little investment oriented to the construction of irrigation main canals.

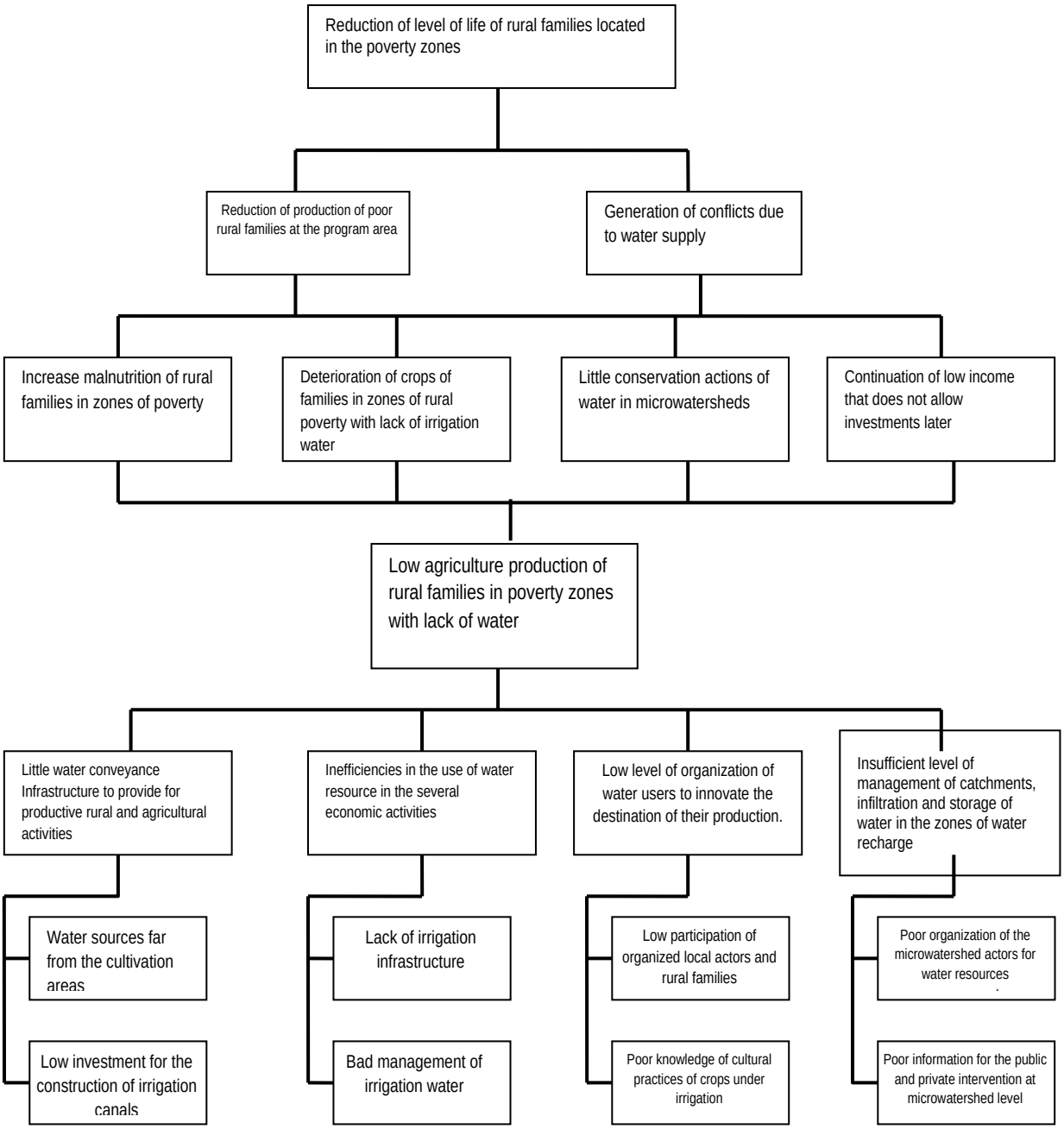
3. Inefficiencies in use of water resources in the several economic activities; this direct cause is sub-divided in the following indirect causes:

3.1 Insufficient maintenance of Irrigation Infrastructure that generates permanent significant loss
3.2 Bad management of irrigation water.

4. Low level of organization of water users to innovate the destiny of production; in turn, two indirect causes have been identified:

4.1 Limited participation of organized local actors and rural families
4.2 Limited knowledge of cultural practices of cultivation under irrigation

Following the tree of causes and effects or tree of problems is presented.



2.5.3 Evolution of the situation in the recent past

Although most of the private and public investments are concentrated in the costa, in the last two decades the importance of the irrigation infrastructure development in the sierra has improved. In consequence, irrigation is one of the most important forms of increasing productivity of land in densely exploited zones such as the inter-Andean valleys. Presently, many public programs of social and productive support such as PSI, FONCODES and AGRORURAL have a component of small irrigation works in rural zones.

One important evaluation about the impact of irrigation projects in the sierra is presented by Baca (1988), who analyzed the impacts of Plan Meriss Inka in three zones of Cuzco. The author identifies differential impacts in the three areas according to the level of

integration to the market, the quality of soil and water assets, finding out that more dynamic zones, with disposition to change their cultivation products obtain better results from the private and social investment point of view.

Another important factor in the success of irrigation projects in the sierra is the organization of users for the distribution of water and infrastructure maintenance. Baca finds out that the Plan Meriss project had a positive impact in the improvement of organization capacity of users in the three intervention areas. One problem that said organizations could not solve though, was the payment of an acceptable tariff, concentrating the contribution on labor force and goods.

The central roles of any authority of an irrigation system is to distribute the resource in an ordained way, avoiding conflicts and assuring that the rights of users are to be respected. This is not an easy task, taking into account that the authority has control only of the greater system of storage and distribution, but less control over the secondary and tertiary systems. In some cases, there is a better control over the secondary and tertiary net but it depends on the existence of an infrastructure of measurement and at said levels; which is uncommon to find in the reality of irrigation at regional and national level. Water management in complexes systems is a difficult task that requires technical and also social abilities, information management and persuasion and patience.

The main purpose of water tariff is not to rationalize the use of resource by users for usually it is a fixed amount associated to the size of lots or the type of product cultivated, imperfectly associated to the actual use of water. Once the tariff is established, it is not adjusted by supply and demand conditions as it would be in the case of a price in the market.

The essence of water tariff is to effectively generate resources for the maintenance and operation of the irrigation system that is to assure the most important roles of the personnel that operates the respective authority system. Maintenance tasks are programmed during certain periods of the year, generally when the system is not much occupied by the users.

The present investment program proposed has studies with different levels of formulation, dated from year 2006. Firstly, said studies were carried out by the National Program of Hydrographic Watershed and Soil Conservation Management – PRONAMACHCS. From year 2009 AGRORURAL takes interest to have studies at pre-feasibility level to achieve feasibility, execute them in charge of the international consultant NIPPON KOEI; and from that, as a starting point to execute them in a planned, participative and sustainable way.

In that time, there were and still there are several alternatives of solution to increase irrigation water supply such as the ones proposed by the regional and local authorities through AGRORURAL; at the different departments of the country, mainly aiming to solve the shortage of water in the dry season, as well as the introduction of double harvest crops; through the construction, improvement and expansion of the small and medium infrastructure of irrigation.

In the last 10 years, AGRORURAL, has executed an accumulated a total of 378 units of physical works such as: reservoirs, pressurized irrigation and multiple use water systems, as well as a total of 789.2 km of main canals in projects of irrigation, with an investment of all source of S/. 60,377,593.4 million soles, located in the interior of the sierra at 19 departments of the country.

Concerning the distribution of this accrued investment along 10 years of intense work, the first place is occupied by the department of Ancash, with investments of S/. 9,6 million distributed in 50 special works of reservoirs, technical irrigation and SAAUM, 129.2 km. of lined canals in projects of irrigation; the second place corresponds to the department of Ayacucho with financing of all sources of S/. 8,0 million soles, with 35 special works of infrastructure, 113.4 km. of lined canals in projects of irrigation and the third place corresponds to the department of Lima, with financing of all sources amounting to S/. 4,9 million soles with 15 special works and 61.2 km of canals lined in projects of irrigation, the lesser investment was in the department of San Martín, 0.2 km of irrigation canals, representing an investment of S/. 83.4 thousand soles.

Table 2.5-2 Annual Summary of Infrastructure of Irrigation and Investment PRONAMACHCS

DEPTOS	2001			2002			2003			2004			2005			2006			2007			2008			2009			TOTAL		
	Unid	Km	Inversión	Unid	Km	Inversión	Unid	Km	Inversión	Unid	Km	Inversión	Unid	Km	Inversión	Unid	Km	Inversión	Unid	Km	Inversión	Unid	Km	Inversión	Unid	Km	Inversión	Unid	Km	Inversión
Ancash	25.0	36.4	2,805,758.4	10.0	16.7	1,311,000.7	3.0	24.9	1,300,326.4	6.0	18.9	1,405,820.0	3.0	4.0	313,245.5	1.0	11.5	889,059.9	2.0	3.7	438,793.2	0.0	6.1	384,292.9	0.0	7.0	834,474.2	50.0	129.2	9,682,771.2
Apurimac	10.0	26.8	1,460,060.9	0.0	10.0	360,486.9	2.0	2.3	155,212.0	1.0	7.1	302,783.1	2.0	0.0	121,409.0	0.0	7.5	408,388.4	1.0	3.5	291,369.2	2.0	9.8	672,333.9	2.0	1.8	240,000.0	20.0	68.7	4,012,043.3
Arequipa	1.0	15.9	1,005,508.3	0.0	4.8	378,573.0	0.0	6.4	385,341.0	0.0	2.3	121,552.0			0.0	0.0	0.8	73,835.6			87,445.0	0.0	2.6	226,690.0	0.0	10.7	1,159,535.0	1.0	43.4	3,438,479.9
Amazonas	9.0	2.1	732,941.5	2.0	0.1	149,060.7	1.0	0.0	45,803.1			0.0			0.0			0.0	1.0	3.9	257,339.0			0.0				13.0	6.1	1,185,144.3
Ayacucho	24.0	67.3	5,181,654.8	5.0	16.2	1,003,973.0	4.0	3.5	248,353.9	2.0	5.3	429,542.4	0.0	3.5	129,720.7	0.0	1.8	131,237.9			0.0	0.0	7.7	370,340.0	0.0	8.2	595,267.0	35.0	113.4	8,090,089.8
Cajamarca	13.0	14.6	1,120,914.9	1.0	1.5	154,086.0			0.0	1.0	0.0	107,420.0			0.0	0.0	3.2	303,469.4			67,583.0	1.0	18.2	1,317,788.6	0.0	10.0	866,252.2	16.0	47.5	3,937,514.1
Cuzco	24.0	12.9	1,677,961.0	8.0	22.5	1,186,294.0	3.0	0.8	191,051.0	2.0	6.3	370,138.3	0.0	0.9	11,500.0	1.0	0.0	149,582.0	7.0	1.8	415,779.2			0.0	6.0	4.3	706,694.8	51.0	49.5	4,709,000.3
Huánuco	14.0	16.6	1,052,890.6	3.0	10.1	491,698.8	5.0	5.2	402,111.3	2.0	2.5	93,078.4	3.0	1.5	118,120.7	0.0	7.9	340,096.5	0.0	4.0	225,459.0		2.4	69,078.0				27.0	50.1	2,792,533.2
Huancavelica	22.0	17.3	1,494,756.9	7.0	1.8	186,192.4	0.0	2.0	107,070.0	1.0	0.0	25,199.5			0.0	1.0	2.7	295,694.9	5.0	9.8	1,283,069.6	7.0	5.6	931,178.1				43.0	39.1	4,323,161.3
Junín	13.0	17.4	1,085,505.1	0.0	2.8	129,923.0	3.0	4.6	269,996.2			0.0	1.0	0.1	48,500.0	0.0	5.1	233,677.9	0.0	5.3	251,491.7	1.0	0.0	157,495.7	2.0	7.3	406,036.3	20.0	42.5	2,582,625.9
Lima	5.0	22.4	2,065,903.6	2.0	3.8	250,525.0	0.0	9.0	248,767.0	0.0	7.0	257,439.3	6.0	0.3	282,906.4	1.0	2.6	214,460.2	1.0	9.5	897,560.9	0.0	2.2	239,811.3	0.0	4.4	501,380.5	15.0	61.2	4,958,754.3
La Libertad	13.0	14.8	1,282,987.8	1.0	6.8	286,392.0	0.0	2.0	115,208.0			0.0			0.0			0.0			0.0	2.0	12.7	918,714.5	1.0	4.5	281,722.6	17.0	40.8	2,885,024.9
Lambayeque	0.0	1.8	113,574.7			0.0			0.0			0.0			0.0			0.0			0.0	1.0		23,870.5				1.0	1.8	137,445.1
Moquegua	1.0	5.6	198,096.0	0.0	4.4	221,177.0	1.0	2.0	143,369.0			0.0			0.0	0.0	3.9	270,859.6			0.0	0.0	3.1	217,297.0		1.2	92,906.0	2.0	20.1	1,143,704.6
Pasco	9.0	0.0	344,170.0	1.0	0.0	32,036.0	3.0	1.8	253,859.0			0.0			0.0			0.0	1.0	2.2	134,567.5	1.0	0.0	43,751.8	0.0	1.3	61,935.7	15.0	5.3	870,319.9
Piura	4.0	2.0	252,603.0	0.0	1.0	89,000.0	0.0	1.0	62,065.0			0.0			0.0			0.0			0.0			0.0				4.0	4.0	403,668.0
Puno	19.0	12.1	1,232,190.9	10.0	10.6	914,725.0	0.0	9.2	210,335.0	4.0	7.8	594,200.0			0.0	0.0	2.4	245,121.5	2.0	7.9	495,597.5	7.0	2.0	593,759.2	2.0	8.9	574,964.8	44.0	60.9	4,860,893.8
San Martín			0.0			0.0			0.0	0.0	0.2	83,499.3			0.0			0.0			0.0			0.0				0.0	0.2	83,499.3
Tacna	3.0	4.6	190,071.6			0.0			0.0			0.0			0.0	1.0	0.8	90,848.6			0.0			0.0				4.0	5.4	280,920.2
TOTAL	209.0	290.6	23,297,549.8	50.0	113.0	7,145,143.6	25.0	74.7	4,138,867.9	19.0	57.3	3,790,672.4	15.0	10.3	1,025,402.2	5.0	50.1	3,646,332.4	20.0	51.4	4,846,054.7	22.0	72.3	6,166,401.3	13.0	69.4	6,321,169.1	378.0	789.2	60,377,593.4

Source: AgroRural, Planning Office: Unit of Programs, Projects and Monitoring. 2009.
Note: Units refer to the number of reservoirs, technical irrigation and SAUM; km refer to canal lining of executed projects of irrigation.(see Table in annex I for further details)

2.5.4 Diagnosed population and characteristics

The present analysis refers to the censed population at district level where the projects of the present program are located, considered as population of indirect population and also included information of effective population or to be attended by the works of the program.

2.5.4.1 Total population according to district, gender and age groups (pyramid of ages of the intervention area)

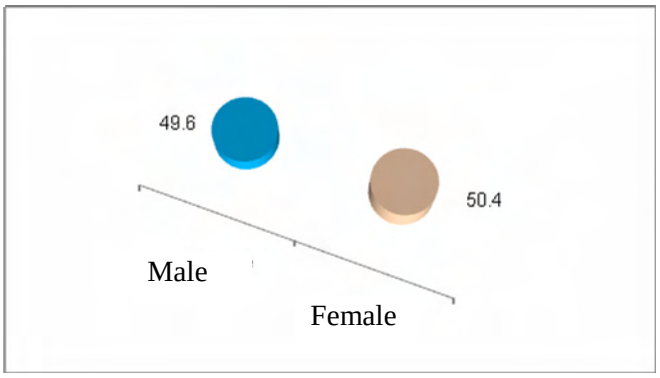
As previously mentioned, the district scope of the PPMIR is conformed by 62 districts, whose total population is 520,988, constituting the population of reference of the Program. The distribution of this population represents an index of masculinity of 98.9%, showing a slight majority of women (50.4%), in respect to the male population (49.6%). In Table 2.5-3 and in Fig. 2.5-1 the respective data are registered..

Table 2.5-3
Total Population according to gender

Gender	Absolute	Relative
Male	258,611	49.6
Female	262,377	50.4
Total	520,988	100.0

Source: INEI, Census 2007.

Fig. 2.5-1



In Table 2.5-4, the spatial distribution of the population of the districts of the present Program is shown, and the main characteristic is the greater number of women living in the rural area and that there are some districts that are mainly rural.

Table 2.5-4

Total population in the scope of the PPMIR according to districts, gender and urban-rural zones

Department	District	Urbano		Rural		Total
		Hombre	Mujer	Hombre	Mujer	
Amazonas	Bagua Grande	14,961	14,546	9,260	8,569	47,336
	Balsas	140	119	611	531	1,401
	Cajaruro	4,315	3,863	9,894	8,663	26,735
	El Milagro	1,032	523	2,301	1,991	5,847
	La Peca	12,651	12,944	3,171	2,740	31,506
	Bagua	-	-	-	-	-
	Subtotal	*33,099*	*31,995*	*25,237*	*22,494*	*112,825*
Ancash	Aija	524	540	498	474	2,036
	Huasta	793	817	437	378	2,425
	Aquia	783	697	703	677	2,860
	Pacllon	649	670	172	31	1,522
	San Luis	1,069	1,170	4,738	5,135	12,112
	Acopampa	436	429	824	799	2,488
	Caraz	6,522	6,808	5,042	5,208	23,580
	Llumpa	170	176	2,833	2,887	6,066
	Huayllan	238	230	1,522	1,676	3,666
	Pomabamba	2,157	2,338	4,989	5,449	14,933
	Recuay	1,409	1,611	994	1,001	5,015
	Catac	1,182	1,223	830	801	4,036
	Ticapampa	699	802	444	491	2,436
	Quiches	321	306	1,035	1,117	2,779
	San Juan	109	123	3,024	3,107	6,363
	Chingalpo	295	247	314	299	1,155
	Ranrahirca	452	484	972	910	2,818
	Subtotal	*17,808*	*18,671*	*29,371*	*30,440*	*96,290*
Ayacucho	Acocro	509	508	3,924	4,012	8,953
	Chiara	776	832	2,326	2,373	6,307
	Vinchos	325	344	7,225	7,893	15,787
	Ma. Pa. de Bellido	206	231	1,135	1,259	2,831
	Los Morochucos	1,378	1,441	2,495	2,684	7,998
	Puquio	6,128	6,650	504	588	13,870
	Concepción	170	195	1,249	1,271	2,885
	Huancapi	991	1,157	118	134	2,400
	Huancaraylla	770	946	23	52	1,791
	Subtotal	*11,253*	*12,304*	*18,999*	*20,266*	*62,822*
Cajamarca	Condebamba	308	329	6,265	6,284	13,186
	San Silvestre	128	131	2,149	2,234	4,642
	Tumbaden	63	71	1,721	1,796	3,651
	San Pablo	1,524	1,661	4,877	5,285	13,347
	Yauyucán	391	411	1,283	1,340	3,425
	Andabamba	122	131	740	759	1,752
	La Esperanza	100	79	1,378	1,332	2,889
	Uticyacu	106	95	740	723	1,664
	Subtotal	*2,742*	*2,908*	*19,153*	*19,753*	*44,556*
Huancavelica	S.A. de Cusicancha	93	100	673	791	1,657
	Subtotal	*93*	*100*	*673*	*791*	1,657
Huánuco	Quisqui	485	527	3,073	3,049	7,134
	Aparico Pomares	610	650	2,118	2,365	5,743
	Subtotal	*1,095*	*1,177*	*5,191*	*5,414*	*12,877*
	Concepción	5,897	6,302	922	1,010	14,131
	Sta Rosa de Ocopa	920	1,013	102	94	2,129
Junín	S.J. Quero	993	1,190	2,073	2,196	6,452
	Nueve de Julio	580	711	229	254	1,774
	Ondores	439	433	867	832	2,571
	Chicche	316	321	295	339	1,271
	Yanacancha	295	291	1,302	1,406	3,294
	Palcamayo	2,090	1,994	2,157	2,054	8,295
	Acobamba	3,530	3,652	3,137	3,083	13,402
	Palca	1,064	1,055	2,230	2,066	6,415
	Tarma	20,698	22,471	3,262	3,734	50,165
	Yauli	634	668	177	161	1,640
	Subtotal	*37,456*	*40,101*	*16,753*	*17,229*	*111,539*
La Libertad	Chugay	923	993	7,486	7,834	17,236
	Lucma	330	322	2,866	2,256	5,774
	Ucuncha	321	312	170	143	946
	Subtotal	*1,574*	*1,627*	*10,522*	*10,233*	*23,956*
Piura	Ayabaca	2,955	3,092	16,638	16,045	38,730
	Montero	521	556	3,269	2,991	7,337
	Sondor	504	483	3,814	3,598	8,399
	Subtotal	*3,980*	*4,131*	*23,721*	*22,634*	*54,466*
TOTAL		*108,991*	*113,014*	*149,620*	*149,363*	*520,988*

The population of reference is mainly a young population, 53.6% conformed by inhabitants under 24 years of age; however in the first five years of life, the population shows a decreasing trend. After, 39.2% is in the range between 25 to 74 years of age, important segment where the work and intellectual force of the population is concentrated.

In the other extreme, 7.2% of the population conformed by elder adults, for whom state policies are being worked out to provide them with social and economic opportunities in order not to be excluded from the national tasks. In Table 2.5-5 the respective data are presented.

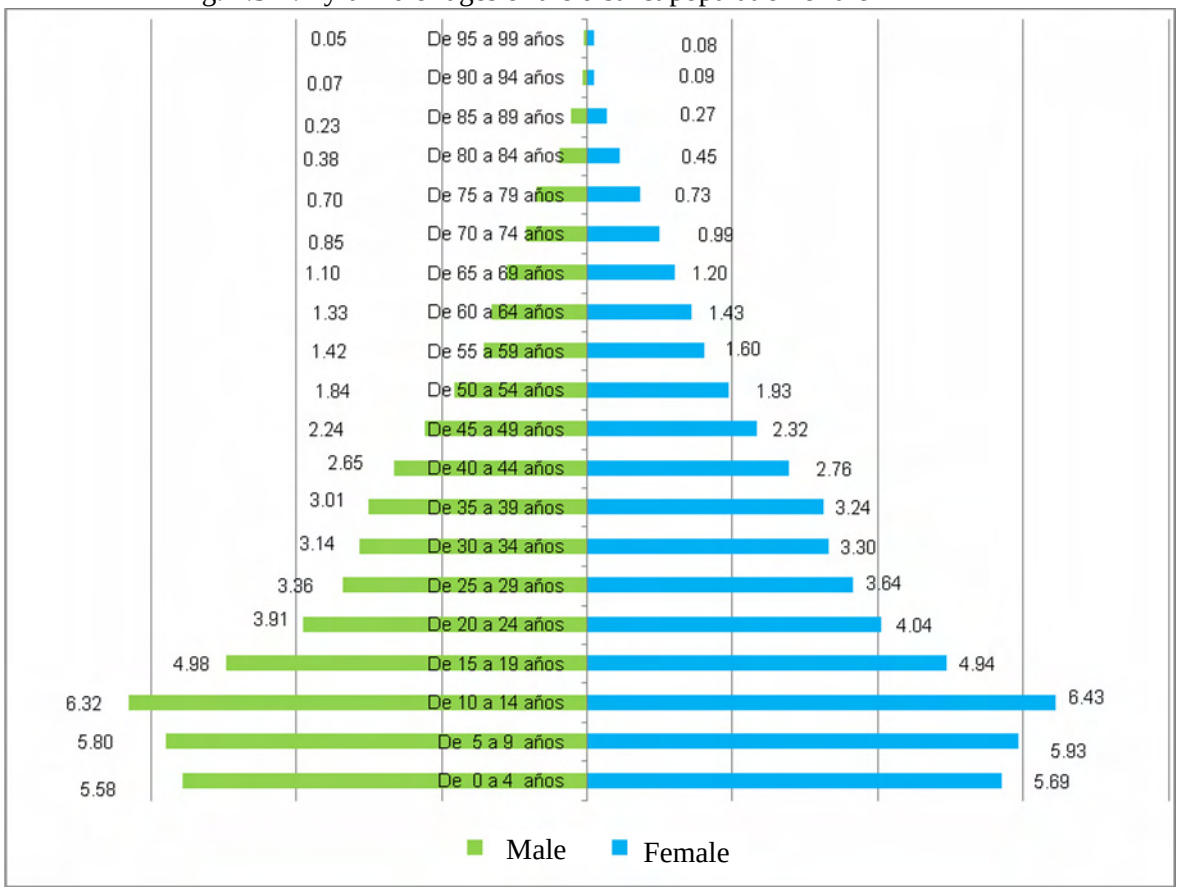
Table 2.5-5
Distribution of total population according to age group and gender in districts

Range	Male	%	Female	%	Total	%	% Acum.
De 0 a 4 years	29,052	5.6	29,629	5.7	58,681	11.3	11.3
De 5 a 9 years	30,192	5.8	30,870	5.9	61,062	11.7	23.0
De 10 a 14 years	32,910	6.3	33,507	6.4	66,417	12.7	35.7
De 15 a 19 years	25,922	5.0	25,750	4.9	51,672	9.9	45.7
De 20 a 24 years	20,377	3.9	21,033	4.0	41,410	7.9	53.6
De 25 a 29 years	17,517	3.4	18,989	3.6	36,506	7.0	60.6
De 30 a 34 years	16,364	3.1	17,216	3.3	33,580	6.4	67.1
De 35 a 39 years	15,656	3.0	16,864	3.2	32,520	6.2	73.3
De 40 a 44 years	13,826	2.7	14,368	2.8	28,194	5.4	78.7
De 45 a 49 years	11,651	2.2	12,074	2.3	23,725	4.6	83.3
De 50 a 54 years	9,588	1.8	10,057	1.9	19,645	3.8	87.0
De 55 a 59 years	7,412	1.4	8,354	1.6	15,766	3.0	90.1
De 60 a 64 years	6,916	1.3	7,469	1.4	14,385	2.8	92.8
De 65 a 69 years	5,743	1.1	6,242	1.2	11,985	2.3	95.1
De 70 a 74 years	4,452	0.9	5,172	1.0	9,624	1.8	97.0
De 75 a 79 years	3,642	0.7	3,791	0.7	7,433	1.4	98.4
De 80 a 84 years	1,981	0.4	2,335	0.4	4,316	0.8	99.2
De 85 a 89 years	1,178	0.2	1,403	0.3	2,581	0.5	99.7
De 90 a 94 years	358	0.1	451	0.1	809	0.2	99.9
De 95 a 99 years	245	0.0	432	0.1	677	0.1	100.0
Total	258,611	49.6	262,377.0	50.4	520,988	100.0	

Source: INEI, Census 2007.

A quick analysis of the distribution by age groups of the population at the district areas of the Program under study, allows to verify that the structure is changing, for a reduction of youngest population in the range of 0 to 4 and from 5 to 9 years of age can be observed, assuming that it is the result of the policies of responsible paternity and birth control. This situation is reflected in the traditional age pyramid with a wider base and narrow top, that starts to change in reference to the first years of life, which base is narrower than in the previous census; data are shown in Fig. 2.5-2.

Fig. 2.5-2: Pyramid of ages of the district population of the PPMIR



2.5.4.2 Spatial distribution of the diagnosed population

In the district sphere of the program, considering INEI's census definitions, major population is rural, it concentrates 57.4% of inhabitants of said territorial spaces; while the remaining 42.6% are concentrated in urban zones. However, from the social and cultural point of view, population so called urban, are persons very much linked to the rural tasks, not only by reason of kinship but also the norms, values and costumes are prolongation of the rural way of life; besides a dynamic exchange of goods and services is maintained.

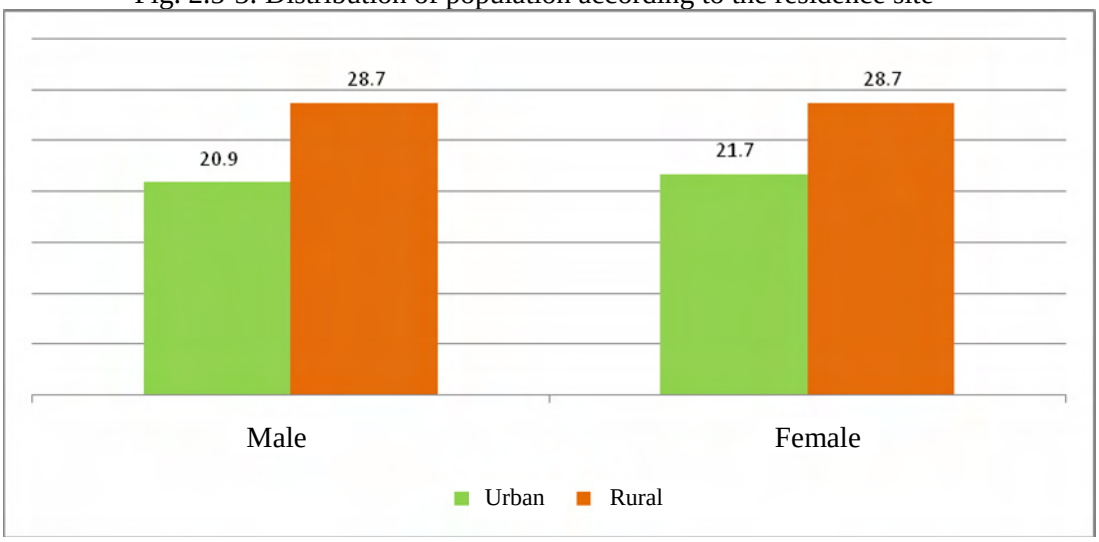
Table 2.5-6
Spatial distribution of the district population in the Program area

Area	Male	%	Female	%	Total	%
Urban	108,991	20.9	113,014	21.7	222,005	42.6
Rural	149,620	28.7	149,363	28.7	298,983	57.4
Total	258,611	49.6	262,377	50.4	520,988	100.0

Source: INEI Census 2007

Concerning spatial distribution according to gender, in the census data at district level, it can be inferred that both male and female are uniformly distributed; that is 28.7% of male and 28.7% of female are settled in rural areas; on the other hand 20.9% of male and 21.7% of female are in the urban area, as shown both in Table 2.5-6 as in Fig. 2.5-3.

Fig. 2.5-3: Distribution of population according to the residence site



2.5.4.3 Affected population

Affected population is the one directly conformed by the farmer families demanding the program. This population is conformed by 24,849 families; conformed by a population of 98,372 inhabitants representing 36.6% of the diagnosed rural population and the 21% of the total diagnosed population. Their characteristics are analyzed later and in Table 2.5-7.

Table 2.5-7 Spatial distribution of the Affected Population

Department	Name of districts	Affected Population	N° Families
Amazonas	Bagua, Bagua Grande, Balsas, Cajaruro, El Milagro y La Peca	9,034	2,164
Ancash	Acopampa, Catac, Caraz, Chingalpo, Huayllan, Huasta, Llumpa, Aquia, Pomabamba, Quiches, Pacllon, Ranrahirca, Recuasy, San Luis, San Juan y Ticapampa.	37,817	8,926
Ayacucho	Acocro, Conception, Chiara, Huancapi, Huancaraylla, Cangallo María Parado de Bellido; Los Morochucos, Puquio y Vinchos.	16,453	4,640
Cajamarca	Condebamba, San Silvestre, Tumbaden , Yauyucan, San Pablo, Andabamba, La Esperanza y Uticyacu	6,732	1,640
Huancavelica	San Antonio de Cusicancha	262	76
Huánuco	Aparicio Pomares y Quisqui	1,127	277
Junín	Conception, Nueve de Julio, Acobamba, Chicche, Ondores, Palca, S.J. de Quero, S.R. de Ocopa, Tarma, Yauli, Yanacancha y Palcamayo	19,054	5,191
La Libertad	Chugay, Lucma y Ucuncha	2,723	650
Piura	Ayabaca, Montero y Sondor	5,171	1,285
Total		98,373	24,849

Source: Prepared based on field data and INEI data, Census 2007.

2.5.4.4 Poverty Map at the intervention area: Incidence of monetary and non monetary poverty (NBI)

One of the most debated issues at academic and political circles is the relationship between economic growth and poverty2. Although the debate is far from being conclusive,

[2] Ver FONCODES-CIES (2002).

basic consensus suggest that economic growth is a necessary condition although not sufficient to reduce poverty, specially extreme poverty and rural poverty.

Provided the present irrigation program, it should be stressed that majority of rural poor have land that has not been benefited by big public projects of irrigation; therefore, the urgency to execute this program, as part of the proper distribution of public income.

The marked difference of poverty and extreme poverty rates between the rural sierra and the other regions of the country alone should be a sufficient justification to point out the rural sierra as a privileged space of intervention. However, still there are groups that oppose to this situation and do not take the necessary decisions for the take off of the sierra and the rural area of the country in general.

As many studies have shown, rural poor in general and the rural poor in the Peruvian sierra, in particular, the target population of the present Program, have a set of characteristics that differentiate them from the urban zones; for example, they have less possibilities of access to basic services of potable water, sanitization, electric power, most use wood and animal dung as fuel to cook their food.

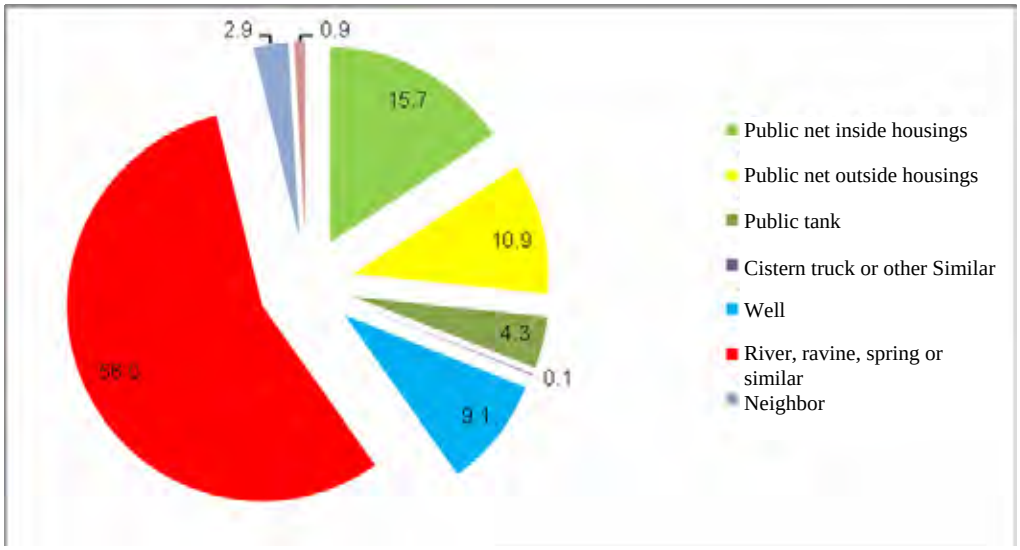
In the case of public service of potable water supply, urban zones show a higher coverage (66%) through a system of domiciliary connections, while in rural zones this service covers only 15.7%, reason why the source of water supply for 56% of the population is rivers, ravines and springs.

Table 2.5-8 Type of water supply in the districts of the Program

Type of service	Urban	%	Rural	%	Total	%
Public net inside housings	31,939	66.0	10,178	15.7	42,117	37.3
Public net outside housings	6,007	12.4	7,060	10.9	13,067	11.6
Public tank	800	1.7	2,776	4.3	3,576	3.2
Cistern truck or other similar	35	0.1	67	0.1	102	0.1
Well	784	1.6	5,896	9.1	6,680	5.9
River, ravine, spring or similar	6,453	13.3	36,236	56.0	42,689	37.8
Neighbor	1,794	3.7	1,864	2.9	3,658	3.2
Other	546	1.1	588	0.9	1,134	1.0
Total	48,358	100.0	64,665	100.0	113,023	100.0

Source: Prepared from data of INEI census, 2007.

Fig. 2.5-4: Water supply in rural zones at the Program area



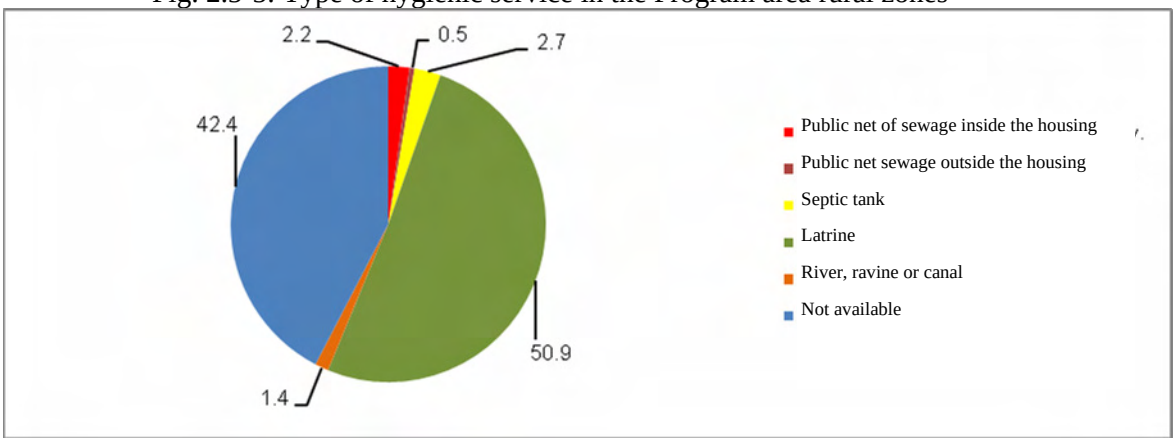
In relation to sanitation services, it has been observed that this service is much more critical; in rural zones 42.4% has not this service and 50.9% use latrines or septic tanks that are better adapted to the rural area due to the dispersion of housings.

Table 2.5-9
Type of hygienic services in the districts of the Program area

Type of hygienic service	Urban	%	Rural	%	Total	%
Public net of sewage inside the housing	25,569	52.9	1,392	2.2	26,961	23.9
Public net sewage outside the housing	5,052	10.4	332	0.5	5,384	4.8
Septic tank	1,534	3.2	1,750	2.7	3,284	2.9
Latrine	8,736	18.1	32,902	50.9	41,638	36.8
River, ravine or canal	735	1.5	903	1.4	1,638	1.4
Not available	6,732	13.9	27,386	42.4	34,118	30.2
Total	48,358	100.0	64,665	100.0	113,023	100.0

Source: Prepared from Census data 2007, INEI.

Fig. 2.5-5: Type of hygienic service in the Program area rural zones



Another relevant characteristic of lack of basic necessities of settled families in the districts of the Program area is in the electric power service; although most of urban areas count on with this service (84.4%); in rural zones the opposite occurs; 73.4% of rural

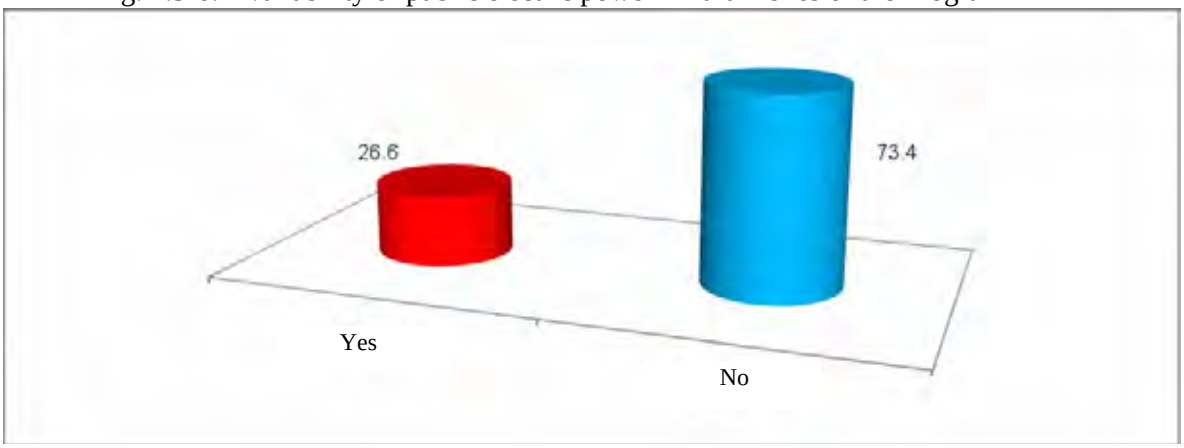
housings do not count on with this vital service.

Table 2.5-10
Type of public electric power service in districts of the Program

Have public electric power	Urban	%	Rural	%	Total	%
Yes	40,795	84.4	17,173	26.6	58,461	51.7
No	7,070	14.6	47,492	73.4	54,562	48.3
Total	48,358	99	64,665	100.0	113,023	100.0

Source: Prepared from INEI census data 2007.

Fig. 2.5-6: Availability of public electric power in rural zones of the Program



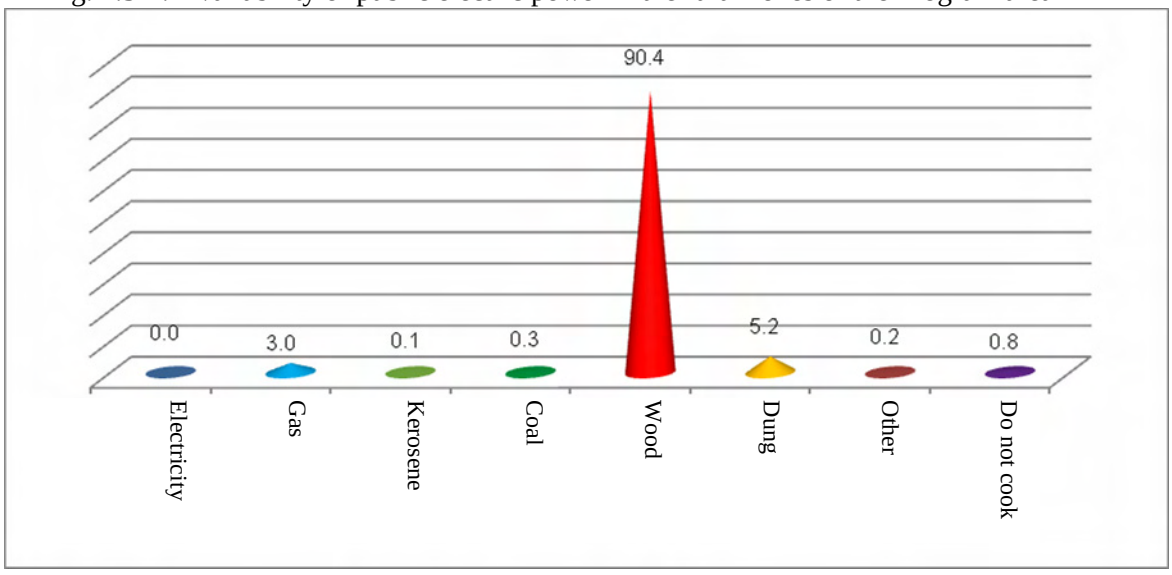
Another characteristic of rural poverty is observed in the type of fuel used for cooking; while in urban zones the majority uses gas (47.8%) in rural zones only 3% use it. However, at the districts of the Program area, the majority of families use wood as the main source of fuel to cook, with all inconvenient it causes to the families: bronchial diseases, alteration in the taste of food, contamination, etc. In Table 2.10 the high consumption of wood is observed, both at urban areas for 43.9% of families and obviously a greater number of families in the rural zones that use it (90.4%), influencing the desertification due to the indiscriminate cutting of trees

Table 2.5-11 Type of energy to cook in the districts of the Program area

Fuel for cooking	Urban	%	Rural	%	Total	%
Electricity	226	0.4	10	0.0	236	0.2
Gas	24,373	47.8	1,980	3.0	26,353	22.6
Kerosene	592	1.2	69	0.1	661	0.6
Coal	418	0.8	193	0.3	611	0.5
Wood	22,401	43.9	59,091	90.4	81,492	70.0
Dung	957	1.9	3,384	5.2	4,341	3.7
Other	118	0.2	134	0.2	252	0.2
Do not cook	1,923	3.8	499	0.8	2,422	2.1
Total	51,008	100.0	65,360	100.0	116,368	100.0

Source: Prepared from INEI census data 2007.

Fig. 2.5-7: Availability of public electric power in the rural zones of the Program area



Concerning indicators of average monetary poverty, in the Program intervention area it has been found out that the incidence of total poverty in average is 62.5% of the population and an incidence of extreme poverty quite high of 30.2%.

Also, other indicators such as the average monthly income per capita of 202.3 soles; a high mortality rate (25 per thousand) and a chronic malnutrition of 4.7% are found at the Program area districts, and according to calculations of the UN, the development index is 0.5350, below the national average that is 0.5976. Indicators data are shown by district in Table 2.5-12.

Table 2.5-12
Average poverty indicators in the districts of the Program area

Indicators	Average Program Area
Infant mortality rate (x 1000)	25.0
Poverty incidence total	62.5
Extreme poverty incidence	30.2
Monthly per capita income	202.3
% chronic malnutrition	45.7
Human Development Index	0.5350

Sources: PNUD-UN: Human Development Index Peru 2006; INEI: System map of cronic malnutrition and Census 2007.

Table 2.5-13
Main Poverty Indicators in Districts of the Program area

Department	Province	District	% vivi. rurales sin agua pota.	% viv. rurales sin desgue	% viv. rurales usan leña en	% viv. rurales sin alum. elect.	Tasa de mort. Infantil (x 1000)	incidencia pobreza total (%)	incidencia pobreza extrema	Ingreso promedio per capita	% desnutri. crónica	Indice Desarrollo Humano	
												IDH	Ranking
Amazonas	Bagua	Bagua	73.0	99.5	97.4	80.0	16.1	40.2	10.2	259.8	19.9	s.d.	s.d.
	Bagua	La Peca	72.5	99.8	94.7	80.4	16.1	40.2	10.2	301.5	32.6	0.5898	510
	Chachapoyas	Balsas	98.6	97.2	94.5	70.9	21.2	55.7	20.2	229.9	53.5	0.5453	1,015
	Utcubamba	Bagua Grande	61.9	97.6	93.2	84.8	19.3	47.7	13.6	259.4	32.8	0.5592	817
	Utcubamba	Cajaruro	91.4	98.1	93.9	97.5	19.5	48.4	12.6	214.4	41.1	0.5441	1,029
	Utcubamba	El Milagro	67.9	99.4	83.8	72.9	19.6	38.5	10.0	293.7	41.2	0.5458	1,002
Ancash	Aija	Aija	78.4	89.8	97.6	23.5	41.5	51.1	16.4	274.7	19.4	0.5987	435
	Bolognesi	Huasta	94.0	96.8	99.6	66.1	26.8	56.2	22.2	232.0	34.3	0.5888	522
	Bolognesi	Aquio	41.9	95.8	96.6	42.2	27.5	58.1	28.2	212.1	59.5	0.5755	638
	Bolognesi	Pacllòn	100.0	100.0	100.0	96.7	28.2	59.9	27.4	234.2	48.6	0.5651	750
	C. F. Fitzcarrald	San Luis	95.8	97.6	98.2	81.1	28.0	73.3	42.9	178.9	78.2	0.5001	1,545
	Carhuaz	Acopampa	14.5	78.3	94.1	21.4	22.5	45.3	17.0	274.9	21.4	0.5356	1,123
	Huaylas	Caraz	28.5	97.1	93.8	55.0	18.4	43.2	14.6	324.3	30.7	0.5561	862
	Mcal.Luzuriaga	Llumpa	56.7	99.8	99.0	79.0	27.2	32.6	67.4	121.8	55.1	0.4708	1,753
	Pomabamba	Huayllan	35.6	99.9	98.4	83.2	17.4	62.1	29.7	186.6	49.8	0.5368	1,114
	Pomabamba	Pomabamba	54.5	96.1	98.7	70.1	17.0	57.0	25.7	231.5	58.2	0.5457	1,007
	Recuay	Recuay	23.1	91.1	98.2	62.9	26.3	53.6	20.5	277.6	33.3	0.6023	402
	Recuay	Catac	65.2	90.3	95.3	61.3	26.4	46.9	13.6	267.4	65.5	0.5940	474
	Recuay	Ticapampa	28.1	97.3	96.6	42.9	25.9	53.2	18.3	287.8	17.0	0.6000	428
	Sihuas	Quiches	99.4	100.0	99.4	22.2	26.6	78.9	53.1	158.3	45.4	0.5114	1,421
	Sihuas	San Juan	98.5	97.9	98.8	72.7	25.8	70.8	39.1	145.4	58.1	0.4866	1,663
	Sihuas	Chingalpo	15.3	94.9	98.1	40.8	26.4	73.5	42.9	163.6	70.4	0.5625	779
	Yungay	Ranrahirca	29.7	98.1	97.1	20.7	38.3	47.3	19.1	259.9	38.0	0.5046	1,494
Ayacucho	Huamanga	Acocro	77.1	98.5	98.2	77.2	27.7	86.1	55.5	128.1	56.4	0.5009	1,538
	Huamanga	Chiara	61.6	99.1	98.5	92.6	26.7	79.7	42.3	146.8	53.0	0.5133	1,392
	Huamanga	Vinchos	68.9	99.6	98.9	56.9	27.3	90.2	65.1	117.5	57.7	0.4900	1,635
	Cangallo	Ma Pa de Bellido	22.7	98.9	98.9	71.0	22.6	83.7	48.4	139.7	53.5	0.4661	1,773
	Cangallo	Los Morochucos	98.3	99.9	98.6	90.5	21.3	82.5	45.8	146.3	51.3	0.4809	1,712
	Lucanas	Puquio	35.1	93.6	98.7	49.7	24.6	60.7	25.2	251.5	35.7	0.5608	803
	Vilcashuaman	Concepción	68.3	99.0	99.1	98.8	25.9	81.6	51.6	140.0	55.8	0.5063	1,481
	V.Fajardo	Huancapi	100.0	100.0	100.0	83.5	20.9	69.4	32.5	204.3	34.4	0.5286	1,217
	V.Fajardo	Huancaraylla	100.0	100.0	100.0	94.3	22.2	85.6	57.1	146.3	51.7	0.4686	1,762
Cajamarca	Cajabamba	Condebamba	16.5	99.3	98.6	76.4	17.0	71.2	34.9	154.1	57.6	0.5095	1,438
	San Miguel	San Silvestre de	50.8	99.5	98.8	99.4	18.8	63.6	27.4	179.7	49.4	0.5442	1,027
	San Pablo	Tumbaden	81.0	100.0	98.6	99.9	34.8	86.1	57.7	171.2	43.0	0.5162	1,364
	San Pablo	San Pablo	38.5	95.0	97.9	92.0	34.7	68.0	35.3	207.0	52.0	0.5430	1,043
	Santa Cruz	Yauyucán	48.1	99.7	98.0	81.4	22.1	72.1	36.9	154.7	54.5	0.5510	939
	Santa Cruz	Andabamba	95.7	100.0	99.5	72.6	21.1	64.5	26.7	176.0	49.6	0.5540	890
	Santa Cruz	La Esperanza	94.8	100.0	98.2	93.0	21.2	61.8	26.2	157.7	49.8	0.5457	1,006
	Santa Cruz	Uticyacu	82.2	99.7	98.9	88.1	20.9	66.3	31.6	171.0	49.7	0.5522	915
Huancavelica	Huaytará	S.A. de Cusicancha	91.5	100.0	92.9	90.2	21.2	81.3	54.5	136.6	57.2	0.5040	1,505
Huánuco	Huánuco	Quisqui	85.1	99.0	98.7	74.9	21.7	79.3	35.4	147.3	59.4	0.4981	1,564
	Yarowilca	Aparico Pomares	98.2	99.7	93.6	91.0	29.3	89.6	53.4	143.4	79.4	0.4987	1,556
Junín	Concepción	Concepcion	27.6	84.8	84.8	14.3	25.5	35.8	6.6	380.9	32.4	0.6139	326
	Concepción	Sta Rosa de Ocopa	17.6	96.1	100.0	37.3	26.3	39.6	11.2	268.7	33.3	0.5961	461
	Concepción	S.J. de Quero	77.7	99.9	99.5	59.5	27.4	72.9	32.6	129.1	51.1	0.5615	794
	Concepción	Nueve de Julio	27.3	91.4	95.0	23.0	25.8	38.4	10.6	266.9	34.3	0.5959	463
	Junin	Ondores	92.3	99.4	84.0	62.1	30.8	47.8	13.3	242.8	30.6	0.5787	602
	Huancayo	Chicche	21.3	99.6	97.8	27.6	24.2	62.2	17.8	199.8	49.7	0.5543	889
	Chupaca	Yanacancha	70.4	100.0	98.8	45.9	27.2	78.9	44.9	130.6	51.3	0.5712	692
	Tarma	Palcamayo	99.6	96.1	98.3	45.6	19.8	60.6	19.4	208.6	43.1	0.5679	720
	Tarma	Acobamba	32.4	81.5	80.3	13.3	21.0	47.4	10.6	280.1	19.9	0.5883	527
	Tarma	Palca	43.4	72.5	85.8	37.8	21.5	50.0	19.2	213.4	25.9	0.5565	858
	Tarma	Tarma	48.9	88.8	80.9	9.7	20.9	35.4	6.5	379.3	32.0	0.6126	333
	Jauja	Yauli	42.4	100.0	100.0	36.5	27.6	38.1	6.8	254.2	40.2	0.5960	462
La Libertad	Sanchez Carrión	Chugay	99.4	99.7	99.1	91.0	29.5	90.1	55.2	101.2	87.3	0.4688	1,760
	Gran Chimu	Lucma	83.7	98.2	97.6	97.8	20.7	75.8	28.1	164.5	42.0	0.5747	650
	Bolivar	Ucuncha	48.7	100.0	97.4	65.8	20.9	91.6	58.6	93.1	67.5	0.5335	1,149
Piura	Ayabaca	Ayabaca	89.6	99.6	97.2	82.2	34.0	67.8	38.5	129.1	30.2	0.5565	857
	Ayabaca	Montero	97.0	99.9	97.5	83.2	33.6	61.1	17.5	165.9	53.9	0.5469	982
	Huancabamba	Sondor	66.8	96.3	98.0	76.8	41.9	61.6	27.4	120.8	10.3	0.5123	1,413

Fuentes: PNUD-UN: Indice de Desarrollo Humano Perú 2006; INEI: Sistema Mapa de desnutricion cronica y Censo 2007.

2.5.4.5 Conditions of analphabetism, educational and nutritional levels of the population

Statistics have shown a low educational level of rural population, whose main characteristic is a less educated population than the urban one, which obviously is associated to a lower rate of school assistance as well as a higher rate of drop-outs3; being the main reason for that, the participation as labor work force in the family; that traditionally is utilized during the sowing and harvest season.

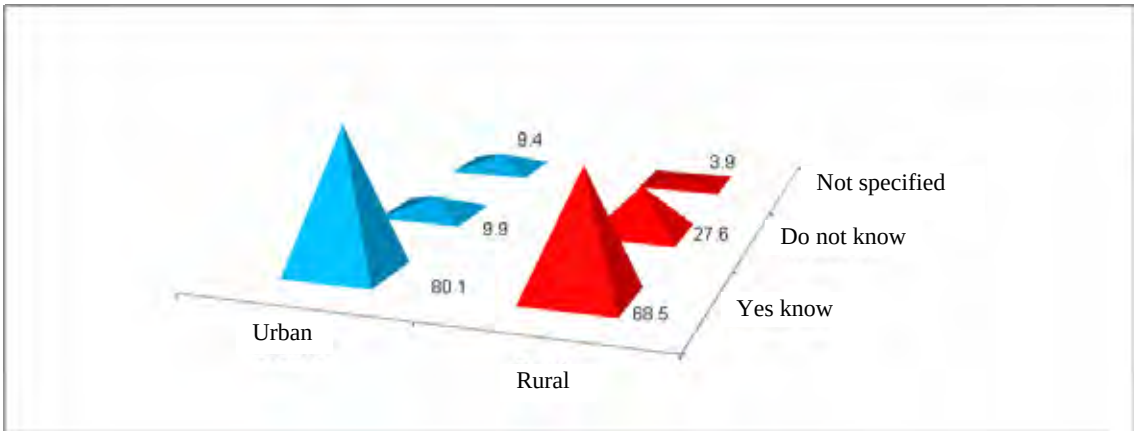
Statistics found for the population of the Program area districts show that still there are a high percentage of inhabitants that do not know how to write or read, affecting in average 18.8% of the total of the population; being lower in the urban area that is 9.9% while it is higher at the rural areas, despite the existing alphabetization programs, which generally are centered in the urban zones of intermediate cities, and more neglected at far away zones due to budgetary reasons and topographic and connectivity conditions that difficult the access. In Table 2.5-14 and in Fig. 2.5-8, the respective data are shown.

Table 2.5-14
Condition of literacy of the population in the Program area districts

Read and write Escribe	Urban	%	Rural	%	Total	%
Yes know	208,672	80.7	179,813	68.5	388,566	74.6
Do not know	25,729	9.9	72,364	27.6	98,103	18.8
Not specified	24,210	9.4	10,200	3.9	34,419	6.6
Total	258,611	100.0	262,377	100.0	520,988	100.0

Source: Prepared from data of INEI Census 2007.

Fig. 2.5-8: Conditions of literacy of the Population in districts of the Program area



In the program area, educational problem is the reflex of the situation at national level but aggravated by the difficulties of communication and the backwardness of the districts, even more in case of minor populations and rural zones where living conditions are harder and turns out in conditionals for a deficient instruction.

The analysis of the educational level of the population in study, corroborate the existing high levels of analphabetism, for it has been found out that 25% of the rural population has no kind of schooling, that is similar to the rural population that cannot read or write. Likewise, the fact that only 59.9% of the rural population achieved the primary level

[3] GRADE: J. Escobal y M. Valdivia: “Perú, hacia una estrategia de desarrollo para la sierra rural”

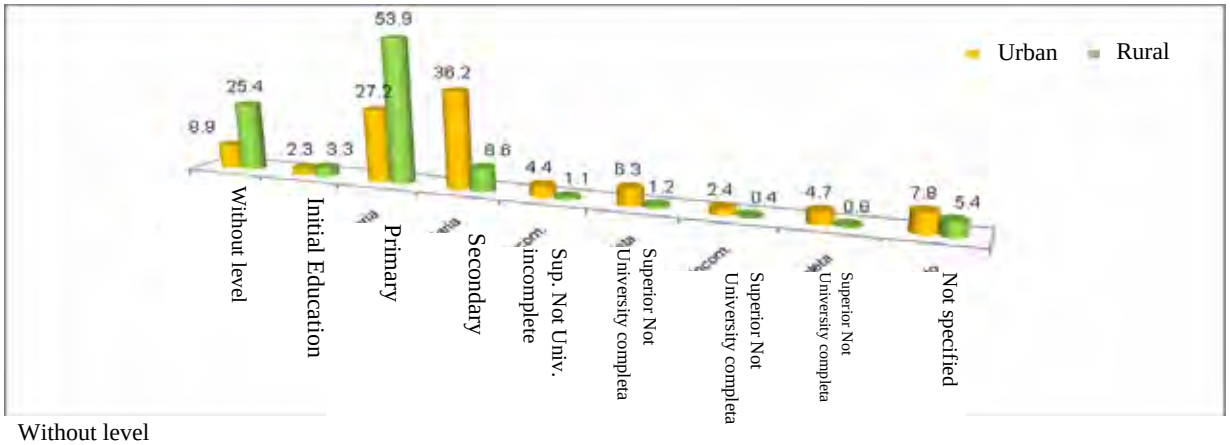
show that they are under qualified compared to urban population; indicating that for effects of knowledge and technology transfer it is necessary to apply "sui generis" methodologies such as "learning– doing" and besides provide new agreements with educational entities to accelerate the alphabetization speed and educational update to make said population more qualified and competitive.

Table 2.5.15
Educational levels achieved by the Program population in districts

Items	Urban	%	Rural	%	Total	%	% Acum.
Without level	22,927	8.9	66,721	25.4	89,648	17.2	17.2
Initial Education	5,904	2.3	8,742	3.3	14,646	2.8	20.02
Primary	70,357	27.2	141,551	53.9	211,908	40.7	60.69
Secondary	93,575	36.2	22,480	8.6	116,055	22.3	82.97
University incompleted	11,253	4.4	2,955	1.1	14,208	2.7	85.70
Superior Not University completed	16,309	6.3	3,106	1.2	19,415	3.7	89.42
Superior Univ. Incomplete	6,211	2.4	1,134	0.4	7,345	1.4	90.83
Superior Univ. Complete	12,029	4.7	1,588	0.6	13,617	2.6	93.45
Not specified	20,046	7.8	14,100	5.4	34,146	6.6	100.00
Total	258,611	100.0	262,377	100.0	520,988	100.0	

Source: Prepared from data of INEI Census 2007.

Fig. 2.5-9: Educational levels of the population under study



Without level

2.5.4.6 Identification of Population

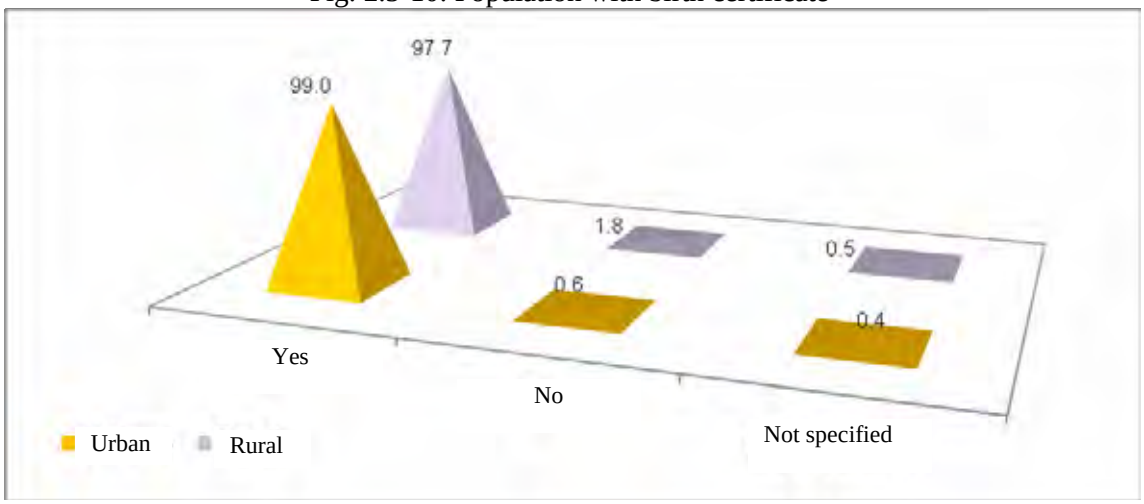
In relation to the constitutional right of having a name and identification, it is observed that population in the project area is aware about the need to have al least a birth certificate, so 98.3% of the population has this document of civil registration; in this sense both rural as urban population fulfils the first norm of identification, as shown in Table 2.15-16 and Fig. 2.5-10.

Table 2.5-16
Population in districts of the Program with birth certificate

Birth certificate	Urban	%	Rural	%	Total	%
Have	255,961	99.0	256,220	97.7	512,181	98.3
Do not have	1,659	0.6	4,833	1.8	6,492	1.2
Not specified	991	0.4	1324	0.5	2,315	0.4
Total	258,611	100.0	262,377	100.0	520,988	100.0

Source: Prepared from data of INEI Census 2007.

Fig. 2.5-10: Population with birth certificate



However, the situation in respect to the Document of personal identification (DNI) is totally different compared to the population with birth certificate, for there are important sectors of the population that cannot guarantee its possession (46%) and only 50.9% manifests they have a DNI and the situation is the same both for urban and rural population. It is very important to disseminate the facilities to obtain a DNI, especially in the rural area, for it is very important to have this document to be considered as a citizen with rights and duties guaranteed by the Political Constitution of Peru. In Table 2.5-17 respective data are shown.

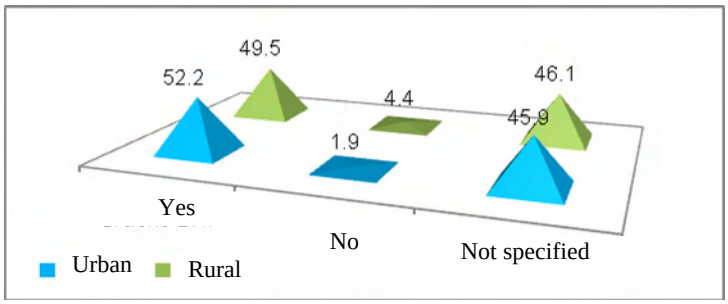


Table 2.5-17
Population of the Study area with DNI

Have DNI	Urban	%	Rural	%	Total	%
Yes	135,113	52.2	129,841	49.5	264,954	50.9
No	4,879	1.9	11,663	4.4	16,542	3.2
Not specified	118,619	45.9	120,873	46.1	239,492	46.0
Total	258,611	100.0	262,377	100.0	520,988	100.0

Source: Prepared from data of INEI Census 2007.

2.5.4.7 Projection of population

Projection of the affected population is shown in Table 2.5-18, calculated based in the inter-census growth rate.

Table 2.5-18
Projection of the affected population projection in the Program area

Department	District	affected population	Projection of the affected population					
			2,010	2,011	2,012	2,013	2,014	2,015
Amazonas	Bagua Grande	862	879	885	890	896	902	908
	Balsas	1,378	1,405	1,414	1,423	1,433	1,442	1,451
	Cajaruro	2,677	2,730	2,747	2,765	2,783	2,801	2,819
	El Milagro	1,890	1,927	1,940	1,952	1,965	1,978	1,991
	La Peca	1,399	1,426	1,436	1,445	1,454	1,464	1,473
	Bagua	828	844	850	855	861	866	872
	Subtotal	**9,034**	**9,211**	**9,271**	**9,331**	**9,392**	**9,453**	**9,515**
Ancash	Acopampa	610	621	625	629	632	636	640
	Aija	1,638	1,668	1,678	1,688	1,698	1,708	1,718
	Catac	2,563	2,609	2,625	2,641	2,657	2,673	2,689
	Caraz	1,503	1,530	1,539	1,549	1,558	1,567	1,577
	Chingalpo	629	640	644	648	652	656	660
	Huayllan	1,290	1,313	1,321	1,329	1,337	1,345	1,353
	Huasta	543	553	556	559	563	566	570
	Llumpa	3,714	3,781	3,804	3,827	3,850	3,873	3,896
	Aquia	480	489	492	495	498	501	504
	Quiches	2,935	2,988	3,006	3,024	3,042	3,061	3,079
	Pacllòn	1,895	1,929	1,941	1,953	1,964	1,976	1,988
	Ranrahirca	354	360	363	365	367	369	371
	Recuay	2,863	2,915	2,932	2,950	2,968	2,985	3,003
	San Luis	2,825	2,876	2,893	2,911	2,928	2,946	2,963
	San Juan	9,206	9,373	9,429	9,486	9,542	9,600	9,657
	Ticapampa	2,829	2,880	2,898	2,915	2,932	2,950	2,968
	Pomabamba	1,290	1,313	1,321	1,329	1,337	1,345	1,353
	Subtotal	**37,167**	**37,840**	**38,067**	**38,295**	**38,525**	**38,756**	**38,989**
Ayacucho	Acocro	3,890	4,038	4,088	4,139	4,191	4,243	4,296
	Cangallo	549	570	577	584	591	599	606
	Concepción	609	632	640	648	656	664	673
	Chiara	7,071	7,339	7,431	7,524	7,618	7,713	7,810
	Huancapi	347	360	365	369	374	379	383
	Huancaraylla	212	220	223	226	228	231	234
	Ma Pa de Bellido	667	692	701	710	719	728	737
	Los Morochucos	663	688	697	705	714	723	732
	Puquio	253	263	266	269	273	276	279
	Vinchos	2,192	2,275	2,304	2,332	2,362	2,391	2,421
	Subtotal	**16,453**	**17,078**	**17,291**	**17,507**	**17,726**	**17,948**	**18,172**
Cajamarca	Condebamba	1,298	1,322	1,329	1,337	1,345	1,354	1,362
	San Silvestre	1,730	1,761	1,772	1,783	1,793	1,804	1,815
	Tumbaden	1,573	1,601	1,611	1,621	1,630	1,640	1,650
	San Pablo	874	890	895	901	906	911	917
	Andabamba	328	334	336	338	340	342	344
	La Esperanza	319	325	327	329	331	333	335
	Uticyacu	336	342	344	346	348	350	352
	Yauyucán	342	348	350	352	354	357	359
	Subtotal	**6,800**	**6,923**	**6,965**	**7,006**	**7,049**	**7,091**	**7,133**
Huancavelica	S.A. de Cusicancha	100	103	104	105	106	107	108
	Subtotal	**100**	**103**	**104**	**105**	**106**	**107**	**108**
Huánuco	Aparico Pomares	615	633	639	646	652	658	665
	Quisqui	512	527	532	538	543	548	554
	Subtotal	**1,127**	**1,160**	**1,172**	**1,183**	**1,195**	**1,207**	**1,218**
Junín	Concepcion	1,531	1,566	1,577	1,589	1,601	1,613	1,625
	Nueve de Julio	1,640	1,677	1,690	1,702	1,715	1,728	1,741
	Sta Rosa de Ocopa	1,753	1,793	1,806	1,820	1,833	1,847	1,861
	Chicche	287	294	296	298	300	302	305
	Yanacancha	302	309	311	313	316	318	321
	S.J. Quero	4,748	4,856	4,892	4,929	4,966	5,003	5,040
	Yauli	1,801	1,842	1,856	1,870	1,884	1,898	1,912
	Ondores	1,510	1,544	1,556	1,567	1,579	1,591	1,603
	Tarma	302	309	311	313	316	318	321
	Palca	264	270	272	274	276	278	280
	Acobamba	3,052	3,121	3,145	3,168	3,192	3,216	3,240
	Palcamayo	1,885	1,928	1,942	1,957	1,971	1,986	2,001
	Subtotal	**19,076**	**19,507**	**19,654**	**19,801**	**19,950**	**20,099**	**20,250**
La Libertad	Chugay	662	688	697	706	715	724	733
	Lucma	1,031	1,071	1,085	1,099	1,113	1,128	1,142
	Ucuncha	1,030	1,070	1,084	1,098	1,112	1,127	1,141
	Subtotal	**2,723**	**2,830**	**2,866**	**2,903**	**2,941**	**2,979**	**3,017**
Piura	Ayabaca	614	630	636	641	647	652	658
	Montero	1,541	1,582	1,595	1,609	1,623	1,637	1,652
	Sondor	3,016	3,095	3,122	3,149	3,177	3,205	3,232
	Subtotal	**5,171**	**5,307**	**5,353**	**5,400**	**5,447**	**5,494**	**5,542**
TOTAL		**97,629**	**99,960**	**100,743**	**101,533**	**102,330**	**103,133**	**103,944**

2.5.4.8 Organization of producers

In relation to the existence of traditional organizations in the area of the program, according to data of the Agricultural Census of 1994, (there is no other information available), the legal condition of farmers in the districts of the program area is in its majority natural persons (96.5%), meaning that they did not conform any organization, only circumstantially conformed to receive aid from the several social programs. The several legal conditions such as societies of fact (2.8%), Society of Limited Responsibility

(0.02%), peasants communities (0.3%), etc., are not representative; in Table 1.18 aggregated data is shown and in Annex the breakdown at district level. This situation is not too different from the present, for rural population, contrary to the promotion of association, are still not united and are grouped only for specific ends and in the short term, not as a basic way of fight against poverty, exclusion and injustice, much less to search for an institutionalized and formal competitiveness to settle the foundations of rural development.

Table 2.5-19
Legal condition of the rural population at the Program area

Department	Number of districts	Natural Person	Society of fact	S.R.Ltd	Peasants Community	Others	Total
Amazonas	6						
Number		9,666	*252*	*3*	*3*	*12*	*9,936*
%		97.3	2.5	0.03	0.03	0.1	100.0
Ancash	17						
Number		15,660	716	10	59	49	16,494
%		94.9	4.3	0.1	0.4	0.3	100.0
Ayacucho	10						
Number		12,720	94	4	94	32	12,944
%		98.3	0.7	0.03	0.7	0.2	100.0
Cajamarca	8						
Number		9,016	336	-	5	37	9,394
%		96.0	3.6	-	0.1	0.4	100.0
Huancavelica	1						
Number		792	2	0	2	0	796
%		99.5	0.3	-	0.3	-	100.0
Huanuco	2						
Number		1240	116	0	10	1	1367
%		90.7	8.5	-	0.7	0.1	100.0
Junín	12						
Number		13,404	498	1	61	57	14,021
%		95.6	3.6	0.01	0.4	0.4	100.0
La Libertad	3						
Number		3,741	108	-	5	1	3,855
%		97.0	2.8	-	0.1	0.0	100.0
Piura	3						
Number		9,519	99	-	28	20	9,666
%		98.5	1.0	-	0.3	0.2	100.0
Total	62						
Number		75,758	2,221	18	267	209	78,473
%		96.5	2.8	0.02	0.3	0.3	100.0

It is quite known that one of the main deficits of the country, not only in the public space but also in the private, is the little capacity of management and negotiation. In this sense, it is fundamental to achieve the strengthening of grassroots associations, conform associations of better level in order to build a cluster in a medium term horizon; also it is necessary to develop and strengthen capacities and competences of management of regional and local governments so they can count on with trained human capital to properly guide the citizens, specially during the commercialization and negotiation stage, articulated to the existing productive chains; so that both in the acquisition of input as well as in the sale of surplus, producers overcome their individual way of acting.

Due to the lack of organized work, producers adopt procedures totally contrary to their own interests, like for example the purchase of input; they buy at retail price, with high added value and from the last link of the intermediation chain; however in commercializing their surplus, they a 180 degrees turn and do exactly the contrary, for they sell at wholesale price, without added value as the first link of the chain.

If producers formed groups to execute and use together (association) some investments (those of high cost used with low frequency) they could reduce this distortion that unnecessarily increase their fixed costs. With the obtained savings they could acquire input they need (but do not buy by lack or resources) to increase earnings and reduce costs per produced kilo. Identical problem occurs with animals; farmers usually have an excessive number of bad fed animals, instead of having less quantity, but well fed and consequently more productive.

The objective reality is that the unnecessary high price of input and unnecessarily low price of crops is due, mostly, to the excessive intermediation; that in turn is due to the fact that farmers have not been formed or trained to organize themselves with entrepreneurial purposes.

In this sense, the services of rural extension should constitute real alternatives for producers to acquire technological knowledge and learn to organize and strengthen the existing organizations, to for example, reduce among other aspects, the excessive links in the sales of their crops.4

The commercialization at province level market is known by producers; however they are not sufficiently trained to achieve commercial advantages for their products, so part of the intervention strategies should be oriented towards:

- Strengthen peasants organizations so their products are jointly put in the market and not individually
- Obtain better prices for their products
- Get lower prices of input by collective acquisitions by wholesale prices.
- Promote the consolidation of strategic alliances with local governments so that they provide locals for commercialization at the municipal markets to organized producers, with the double benefit for both agents and actors, eliminating excessive intermediation that pay low prices to producers and increase prices to consumers.
- Make more dynamic the access of producers to sales points in local and regional fairs
- Promote the quality control of products and avoid losses in the post-harvest processes in the lots as in distribution.
- Promote productive change in order for producers to gradually choose products with better productivity and more demand in the internal and external markets.
- Properly use the comparative advantages of micro-climates and the goodness of having a diversity of products in periods of shortage in other latitudes.
- Establish commercial contacts and distribution channels
- Knowledge of commercial transactions and ways to reduce costs.
- Allow access to short and long term capital.
- Promote the knowledge of competitors in the local, regional, national and international scope.

In this aspect, it is necessary to properly define the productive chains and the possibilities of establishing small agricultural business, in order to provide added value to the surplus production; fundamentally in the processing of milk, sheep wool and alpaca fiber. Meat commercialization is to be offered mainly in regional markets, for they are in deficit, promoting agreements with local governments for the permanent access of these products to the municipal markets.

[4] Polan Lacki: Several articles published by FAO.

As there is a production of the Peruvian sierra that can successfully enter in the international market and as peasants (the majority with very small lots) by themselves cannot face this challenge, nor should do it because they do not know this activity, the presence of an external agent to approach the vectors of demand to the zone of production is necessary. The question is who should be this agent. In Third World countries where agriculture has started to flourish, three economic agents or agro-businessmen have significantly acted: the industrial, the exporter and the broker or importer.5

There are many examples of this intervention in the literature related to the issue. So , Williams and Karen (1987) points out that: "...surprisingly in all places where agrobusiness started, these activities have adjusted almost perfectly to the socioeconomic structures, to the different stages of human development where they have actuated without mattering the prevailing ideological policy. Agrobusiness has also demonstrated that the answer of peasants is surprisingly similar in any part of the world, although the differences in culture, social order, agricultural development and government policy. The impact of said activities in the supply of food, the power generated to modernize and improve the level of rural population life should be catalogued as one of the great achievements of the twenty century ".

In this context, it corresponds to AgroRural to lead and coordinate with the other public sectors, private companies and rural producers an articulated action to converge synergically in the promotion of association as an effective way to achieve rural development, according to the characteristics and resources of each territorial area.

2.5.4.9 Situation of land connection in the Program regional area

Accessibility is an important aspect of agriculture competitiveness; at this point conditions in the sierra are also unfavorable due to the poor existing road infrastructure and the difficult topography. Communication roads from the producers' lots, communities, villages, annexes and population toward the district, provincial and regional capital cities are important to give dynamism to markets and the flow and exchange of goods and services between the urban and the rural. The shortage of roads and the bad state of conservation are a day to day problem that discourage and jeopardize trade and exchange, so the extension or construction of new roads and the respective maintenance are vital to contribute to the sustainable and competitive development.

In this context, the situation of land connection in the country is not yet the most adequate to integrate rural producers with the population, small and intermediate cities; only national roads, both the longitudinal of the costa as the penetration roads to the sierra and Selva are the ones that allow the connection of the capital of the republic with the main regional cities and have more extension of paved and compacted roads; however their relative significance in relation to the departmental and local area represent only 9.4% and 26.7% respectively, that obviously satisfy the flow of demand of persons and goods and services of the costa producers and larger inter-Andean valleys. While non compacted roads (23%) and trails (41%) represent great part of the road net and justly said roads are the ones that connect rural zones of production to population and intermediate cities where there are greater difficulties to expand internal markets and make the flow of goods and services exchange more dynamic.

Table 2.5-20 and Fig. 2.5-11, show the summarized data and Table N° 1.20 show breakdown data by regions at the program of irrigation infrastructure program area.

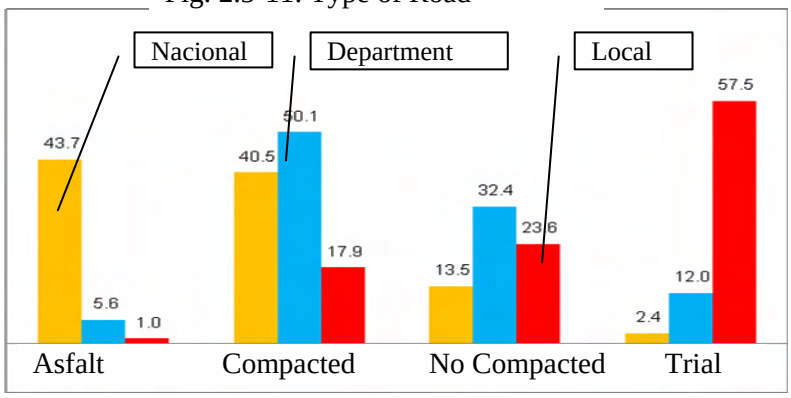
[5] José Carlos Vera: Agricultural Development in Peruvian Sierra and the External Market

Table 2.5-20
Summary of the situation of road net in the Program area

Sphere	Extension by type of road (km)					
	Paved	Compacted	No compacted	Trail	Total Km.	%
National	3,732.30	3,460.93	1,152.57	203.48	8,549.3	18.2
Departmental	377.49	3,398.35	2,197.72	811.80	6,785.4	14.4
Local	330.96	5,682.54	7,465.56	18,212.88	31,691.9	67.4
Total	4,440.75	12,541.82	10,815.85	19,228.16	47,026.6	100.0
(%)	9.4	26. 7	23.0	40.9	100.0	

Source: Prepared based on information from the Regional Directions of Transports and Communications in the scope of the Program.

Fig. 2.5-11: Type of Road



In relation to the type of roads, Graphic N° 2.5-11, shows that 43.7% is paved and correspond to the national road net; 50% of compacted roads are in the departmental net and 57.5% to trails of the local net, which is the net requiring to be developed for it is one of the basic infrastructures that will help to improve competitiveness of rural products and the flow of trade and passengers to benefit the rural territorial development.

Table 2.5-21 Situation of road net in the scope of the Program

Type of road	Extension (km)	%	Extension by type of pavement (km)			
			Paved	Compacted	No compacted	Trail
AMAZONAS						
National	736.79	31.88	175.34	518.12	31.35	11.98
Departmental	394.24	17.06	2.95	264.16	122.13	5
Local	1,180.41	51.07	0	395.01	137.42	647.98
Total	2,311.44	100	178.29	1,177.29	290.9	664.96
(%)	100		0.08	0.51	0.13	0.29
ANCASH						
National	1,433.21	29.03	707.09	726.12	0	0
Departmental	1,026.79	20.8	139.34	416.52	310.83	160.1
Local	2,477.43	50.18	23.6	360.51	853.26	1,240.06
Total	4,937.43	100	870.03	1,503.15	1,164.09	1,400.16
(%)	100		0.18	0.3	0.24	0.28
AYACUCHO						
National	1,472.55	16.55	425.43	321	726.12	0
Departmental	1,049.45	11.8	0	523.75	525.7	0
Local	6,373.94	71.65	8.5	1,092.91	2,888.08	2,384.45
Total	8,895.94	100	433.93	1,937.66	4,139.90	2,384.45
(%)	100		0.05	0.22	0.47	0.27
CAJAMARCA						
National	1,229.97	19.54	403.41	637.06	85	104.5
Departmental	666	10.58	0	594.05	48.1	23.85
Local	4,400.18	69.89	4	608.43	455.39	3,332.36
Total	6,296.15	100	407.41	1,839.54	588.49	3,460.71
(%)	100		0.06	0.29	0.09	0.55
HUANCAVELICA						
National	580.2	9.12	189.8	390.4	0	0
Departmental	831.73	13.08	0	511.57	320.16	0
Local	4,948.82	77.8	0	1,279.78	1,100.71	2,568.33
Total	6,360.75	100	189.8	2,181.75	1,420.87	2,568.33
(%)	100		0.03	0.34	0.22	0.4
HUANUCO						
National	667.83	22.44	282.93	130.9	204	50
Departmental	463.84	15.59	6	203	122.24	132.6
Local	1,844.10	61.97	0	185.6	90.4	1,568.10
Total	2,975.77	100	288.93	519.5	416.64	1,750.70
(%)	100		0.1	0.17	0.14	0.59
JUNIN						
National	874.39	13.58	505.5	368.89	0	0
Departmental	589.8	9.16	34.2	482	66.6	7
Local	4,976.30	77.27	36.4	1,636.50	1,353.85	1,949.55
Total	6,440.49	100	576.1	2,487.39	1,420.45	1,956.55
(%)	100		0.09	0.39	0.22	0.3
LA LIBERTAD						
National	697.34	15.81	378.3	241.94	77.1	0
Departmental	1,185.31	26.87	50.2	244.3	613.86	276.95
Local	2,527.96	57.32	124.16	72.1	272.85	2,058.85
Total	4,410.61	100	552.66	558.34	963.81	2,335.80
(%)	100		0.13	0.13	0.22	0.53
PIURA						
National	857	19.5	664.5	126.5	29	37
Departmental	578.2	13.1	144.8	159	68.1	206.3
Local	2,962.80	67.4	134.3	51.7	313.6	2,463.20
Total	4,398.00	100.00	943.6	337.2	410.7	2,706.50
(%)	100		0.21	0.08	0.09	0.62

Source: Prepared based on information from the Regional Directions of Transports and Communications in the scope of the Program

2.5.4.10 Financial capacity and availability of producers

It is possible that the small farmer in the sierra has no money in cash, for their primary needs are satisfied with the resources they have: land, family labor force and the support

of relatives for works when required. That is, basic needs of housing, food, and non wage work are solved: they have a place to sleep, what to eat and where to work; however problems arise when it is asked how they satisfy them (quantity and quality) and other non satisfied basic necessities, such as the ones analyzed in the previous items.

However, the fact that small rural producers have assets (land, cattle and labor force) is a guarantee that any project, with more reason irrigation infrastructure, will have a multiplying effect in the goods they have and will improve the life quality of the family.

It should be stressed that great part of rural poor have land that has not been benefited by large public irrigation projects, and many times, water generated by high-Andean watersheds are not used for themselves but for the large valleys in the sierra and costa, and have never been compensated for this unequal and unfair way of territorial water use and crossing the land of private land of peasants communities and/or small peasants, to whom a fair price for the platforms of canals used in their land have not been granted . Said procedures, too unfair and exclusive combined with the marked difference of poverty and extreme poverty between the rural sierra and the other regions of the country, for themselves, should be enough justification to appoint the rural sierra as a privileged space of intervention, without needs of request for money contribution for the execution of public investment projects.

The exclusion of the state of rights to peasants and small farmers is obvious, to make a public work in the cities, land is expropriated from privates and a fair price is paid; in the rural area, irrigation is made to take water from the sierra to the costa crossing private land and no payment is considered; however, when a small irrigation work is to be made (a canal or dam), it is intended that the “beneficiary” makes a disbursement, named compensation or contribution of beneficiaries, or in order to have an irrigation work, beneficiaries have to demonstrate the capacity to pay for part of the public investment.

In the present program 24,849 families whose land are to be provided with permanent irrigation were identified, it is estimated that each one of them has to contribute with labor by day/month/year at an average daily cost of S/. 15.00 and S/. 30.00; said contributions oscillated between S/. 98,402,040 or S/. 196,804,080 per year, respectively. Daily, monthly and annual costs are shown as follows:

Participant adults	Range
S/. Daily	24,849
Daily contribution S/.	15 - 30
Number of days /month	372,735 - 745,470
Monthly contribution S/	22
Annual contribution S/.	8,200,170 - 16,400,340
	98,402,040 - 196,804,080

Also, having as reference the perfil of projects conforming the Program containing primary information of each place, Table N° 1.21 has been prepared, showing the stratification of lots to be irrigated; 87% of families have the 60.3% of the total surface to be irrigated; 7.8% of families have 19.7% of the land to be irrigated and the remaining 5.2% families occupy 20% of the land to be irrigated.

This stratification showed averages of 1 ha, 4 ha and 6 ha; the same that have been assumed as typical models to make the respective calculations, allowing to have an

approximate view of the productivity and income in a situation with and without project, by which it is shown the importance of an irrigation project that reduces risks and allows the mini, small and medium land holder to increase the net value of production in quite important proportions.

Table 2.5-22
Stratification of land to be irrigated

Range	N° Families	%	Area Ha	%	Average
Less than 3 ha	21,622	87.0	23,347.5	60.3	1.1
3.0 to 4.9 ha	1,929	7.8	7,640.0	19.7	4.0
More than 5.0 ha	1,298	5.2	7,744.0	20.0	6.0
Total	24,849	100.00	38,731.5	100.0	1.6

Source: Perfil of projects that conform the Program

In model A, that considers that one typical lot with 1 ha of arable land (mini-holding), calculations have been made with the most representative crops in the sierra, considering earnings and prices obtained by farmers in a situation without project, whose production volume is mainly destined to self-consumption; while in a situation with projects, where farmers are motivated by permanent availability of water, are organized and can jointly achieve better prices, better technology, greater earnings, high index of soil exploitation and invest in cultural labors, achieve higher volume of production and increase the net value of production in 79.4%, that not only satisfy self-consumption but also is enough to purchase goods and services, for the net value of production goes from daily S/. 8.3 without project, to S/. 14.0 daily with project; thus, they become citizens who will pay indirect taxes, therefore contributing to fiscal recollection to the treasury and obviously in the payment of external debt.

Model A : Mini-holding

Without Project

Crop	Area	Earning	P.V.	Price	PGV	TCP	PNV
Potato	0.50	9,338.53	4,669.3	0.58	2,708	500	2,208
Wheat	0.25	1,384.64	346.2	0.80	277	50	227
Broad bean	0.05	3,620.14	181.0	0.63	114	50	64
Sweet pea	0.05	2,792.50	139.6	0.94	131	50	81
Amillaceous Maize	0.15	2,447.50	367.1	1.21	444	50	394
Total	1.00				3,675		2,975

With project (includes second harvest) Incremental Variation: 79.4%

Crop	Area	Earning	P.V.	Price	PGV	TCP	PNV
Potato	0.50	12,582.5	6,291.2	0.58	3,649	1000	2,649
Wheat	0.25	2,221.4	555.3	0.80	444	150	294
Broad bean	0.05	4,635.3	231.8	0.63	146	150	-4
Sweet pea	0.05	4,135.7	206.8	0.94	194	150	44
Amillaceous Maize	0.15	3,201.4	480.2	1.21	581	150	431
Vegetables	0.25	9,524.9	2,381.2	0.87	2,072	150	1,922
Total	1.25				7,086		5,336

In model B, the respective calculation has been made, but based in crops of 4 ha (smallholding), maintaining the products, area and representative earnings for the indicated lot. In this model, the incremental variation is 128% and the net value of

production goes from S/. 21.7 daily without project to S/. 49.6 daily with project.

Model B : Small producers

Without Project

Crop	Area	Earning	P.V.	Price	PGV	TCP	PNV
Potato	1.00	9,500	9,500.0	0.58	5,510	1,500	4,010
Wheat	1.00	1,450	1,450.0	0.80	1,160	500	660
Broad bean	0.75	1,200	900.0	1.07	963	500	463
Sweet pea	0.50	3,000	1,500.0	0.94	1,410	500	910
Amillaceous Maize	0.75	2,500	1,875.0	1.21	2,269	500	1,769
Total	4.00				11,312		7,812

With project (includes 2nd harvest) Incremental Variation: 128.6%

Crop	Area	Earning	P.V.	Price	PGV	TCP	PNV
Potato	1.00	15,000	15,000.0	0.58	8,700	3,500	5,200
Wheat	1.00	2,300	2,300.0	0.80	1,840	780	1,060
Broad bean	0.75	1,850	1,387.5	1.07	1,485	780	705
Sweet pea	0.50	4,200	2,100.0	0.94	1,974	780	1,194
Amillaceous Maize	0.75	3,250	2,437.5	1.21	2,949	780	2,169
Vegetables	1.00	9,550	9,550.0	0.87	8,309	780	7,529
Total	5.00				25,257		17,857

Model C, is represented by a medium lot of 6 ha. As in the previous cases the same products, area and representative earnings have been maintained for the indicated lot size. In this model, incremental variation is 158% and the net value of production goes from S/. 38.4 daily without project to S/. 99.5 daily with project. It is obvious that availability of irrigation water in the sierra is an urgent necessity of farmers and its timely use provide them security and minimizes the risks proper of a rain fed agriculture.

Model C : Medium producers

Without Project

Crop	Area	Earning	P.V.	Price	PGV	TCP	PNV
Potato	1.50	11,000	16,500.0	0.58	9,570	2,500	7,070
Wheat	1.00	1,500	1,500.0	0.80	1,200	650	550
Broad bean	1.00	1,300	1,300.0	1.07	1,391	800	591
Sweet pea	1.00	3,100	3,100.0	0.94	2,914	1,000	1,914
Amillaceous	1.50	2,600	3,900.0	1.21	4,719	1,000	3,719
Total	6.00				19,794		13,844

With project (includes 2nd harvest) Incremental Variation: 158.8%

Crop	Area	Earning	P.V.	Price	PGV	TCP	PNV
Potato	1.50	16,000	24,000.0	0.5	12,000	4,000	8,000
Wheat	1.00	2,400	2,400.0	1.1	2,640	800	1,840
Broad bean	1.50	1,900	2,850.0	1.4	3,990	1,500	2,490
Sweet pea	1.00	4,300	4,300.0	1.6	6,880	1,500	5,380
Amillaceous Maize	1.50	3,350	5,025.0	1.5	7,538	1,500	6,038
Vegetables	1.00	9,700	9,700.0	1.4	13,580	1,500	12,080
Total	7.50				46,628		35,828

It should be stressed that in the three models real earnings per hectare (without project) have been considered, and for the situation with project moderate earnings, below the regional average have been considered. Moreover, the same prices have been considered for both situations, with and without project, for prices fluctuates, depending on the supply of the products and the climatic conditions that may change prices and other production factors.

2.5.5 Description of the Affected Areas.

In the sierra, there is a diversity of habitats generated by the different relief of Andes, different climates, gradients and type of soil, besides the variable exposition of the slopes to the sun, protection against the wind and the presence of rocky and stony areas. In sierra, cultivation on slopes at hills or in the narrow inter-Andean valleys are predominant.

Most part of Andean agriculture depends on the rainfalls that are registered in two periods mainly: October-November and March - April (summer). Rain in sierra is irregular, both in volume and period, and it consists in one of the main problems of this region.

The sierra also presents variation of crops as it ascends through the terraces. Up to 2,500 meters sugar cane is cultivated and up to 3.000 meters maize and beans. Higher, up to 3,800 meters wheat and barley are produced and even higher, little more than 4,000 meters, there is the potato and an important variety of tubercles and Andean products.

The factors that explain low productivity in the agricultural sector in sierra and related to rural poverty are the lack of land, technology and irrigation water to allow the expansion of harvested area.

In the case of water sources, they are exhausted, committed or are too far requiring dam works, improvements and derivations, which costs in many cases are over the maximum limits of investments fixed by MEF, turning them into projects not possible to be executed. Also it is evident the inadequate road infrastructure, high risks of production (plagues, frost, droughts, etc.) and the asymmetric relationship in commercialization, for farmers sell their harvest to the first link of the chain and buy the input at high prices to the last link of the commercial chain.

Adding to the three first range of surface, it could be affirmed that the small production, corresponds approximately to 92.11% of the total of producers in the country, distributed in the following proportion: 15.1% in costa, 14.3 % in Selva and 70.6% in the sierra; accompanied – in a lesser proportion- by an important layer of medium producers (mainly in the costa).

This small production (less than 20 ha), of the total agricultural land in the country, corresponding to 5 million 476 thousand ha, occupies 3 million 612 thousand hectares, constituting 66% of the total. From the totality of natural pasture in the country (17 million has), according to the same census, small production controls 868 thousand ha, but at the Peasants Communities, it is calculated that small production controls not less than 55% of the existing natural pasture.

As part of this structural nature of Peruvian agriculture, its control over the quality of land should be stressed; for in one side, this same small production, has control of almost 75% of the total of cultivation land under irrigation (1 million 729 thousand ha) and the 62% of the total of rain fed cultivation land (2 million 308 thousand ha). On the other hand, from the total gross value of agricultural production (food and intermediate goods – input), 71.5% comes from small production, in the same manner, about 60% of the production

for the external market is committed to small production.

According to the 1994 census, small property less than 5 ha represents 67% of the area for transitory crops and 48% dedicated to permanent crops. This structural nature indicates us that in order to make Peruvian agriculture feasible as a whole, small production necessarily has to be feasible.

2.5.5.1 Distribution of rain fed agricultural surface and with irrigation, by departments.

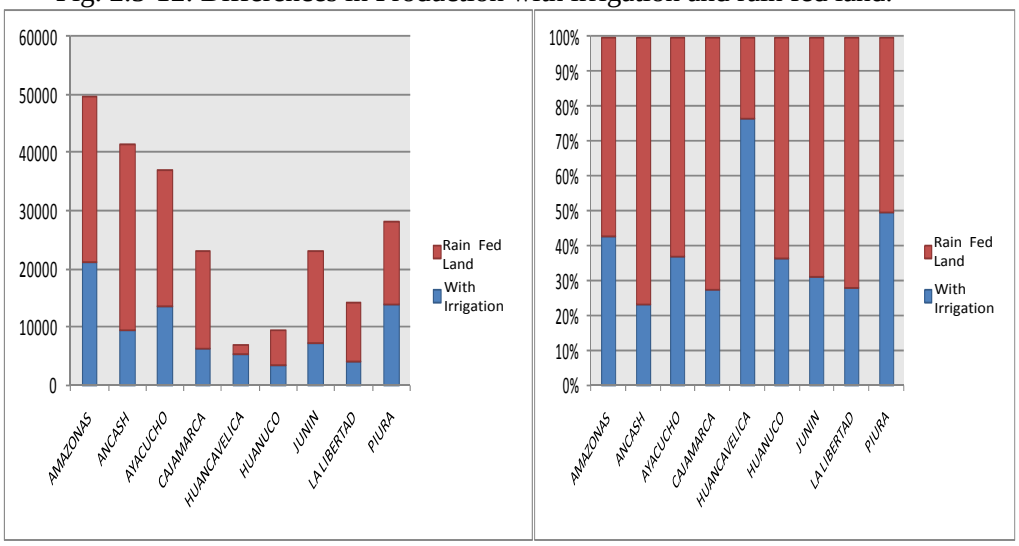
Agricultural areas or of production distributed in the program area are 233, 129 ha, only 36% are under irrigation and the other 63% is rain fed. The distribution in the departmental scope is shown in Table 2.5-23.

Table 2.5-23
Rain fed Cultivation Areas and under irrigation at level of districts benefited by the Program

Department	Irrigated	Rain fed	Subtotal
Huánuco	3,386.91	5,977.22	9,364.13
La libertad	3,962.53	10,279.36	14,241.89
Huancavelica	5,194.55	1,583.33	6,777.88
Cajamarca	6,342.34	16,725.49	23,067.83
Junín	7,240.42	15,980.02	23,220.44
Ancash	9,532.61	32,068.01	41,600.62
Ayacucho	13,549.13	23,349.32	36,898.45
Piura	13,967.63	14,276.04	28,243.67
Amazonas	21,161.51	28,553.48	49,714.99
Total General	84,337.63	148,792.27	233,129.9

Source. III National Agrarian Census– INEI

Fig. 2.5-12: Differences in Production with irrigation and rain fed land.



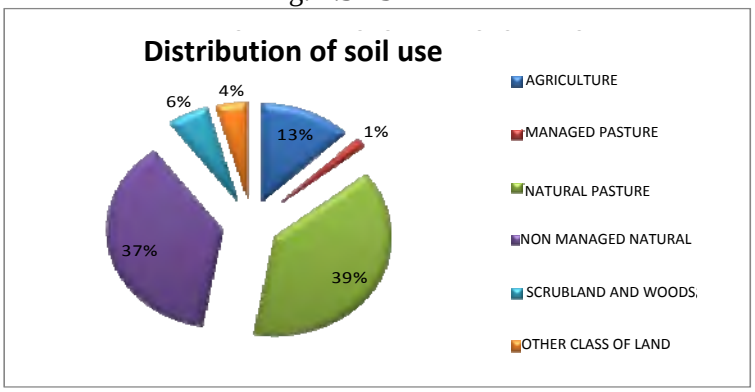
According to the III National Agrarian Census, surface of land in the districts of the program are distributed as shown in Table Fig. 2.5-24.

Table 2.24 Use of soil in the beneficiary districts of the Program

Department	Agriculture	Managed pasture	Natural pasture	Non managed pasture	Scrubland and Woods	Other class of land	Subtotal
Amazonas	49,714.99	2,191.82	18,288.97	16,097.15	46,187.70	6,528.50	139,009.13
Ancash	41,600.57	2,953.40	172,810.81	169,857.42	16,631.12	31,390.85	435,244.17
Ayacucho	36,898.31	2,607.55	150,105.49	147,498.06	15,177.46	19,392.91	371,679.78
Cajamarca	23,067.83	3,145.71	19,488.03	16,342.32	5,094.75	4,269.66	71,408.30
Huancavelica	6,777.88	3,520.55	14,323.78	10,803.23	288.75	281.00	35995.19
Huanuco	9,364.12	878.58	16,212.99	15,334.41	1,083.30	4,672.02	47,545.42
Junin	23,220.42	4,619.51	180,073.05	175,453.53	814.86	2,447.27	386,628.64
La libertad	14,241.89	371.25	24,409.01	24,037.76	1,715.32	5,878.63	70,653.86
Piura	28,243.68	7,649.89	114,950.07	107,300.20	18,064.62	5,261.09	281,469.55
Sub total	233,129.69	27,938.26	710,662.20	682,724.08	105,057.88	80,121.93	**1,839,634.04**

Source. III National Agrarian Census– - 1994

Fig. 2.5-13



The use of soil in the districts of the program is mainly used for pasture, being the agricultural land 13% with low levels of production and productivity.

In year 2009, 1,288,824 ha of land have been harvested in the 62 districts of the program, according to Table 2.5-25.

Table 2.5-25 Harvested areas in the districts of the Program

Department	Harvested area (ha)
La Libertad	771,857
Piura	373,869
Amazonas	76,899
Ayacucho	23,279
Cajamarca	16,348
Junín	12,735
Ancash	11,083
Huanuco	2,581
Huancavelica	174
Total	1,288,824

Source. DATA Office of Economics and Statistic Studies MINAG 2009

2.5.5.2 Present main products.

The Study area is quite large and heterogeneous, where each territory presents a large variety of products; many of them are only for family consumption and occasionally used for the exchange of products (barter) among poor farmers. In this sense, the several types of product in the 62 districts have been examined, in order to establish a representative list of products for the Program; 24 main crops have been identified, both permanent and transitory, with special care to select not only products for self-consumption but also those possible to be commercialized, at the respective local markets as well as in zonal and regional markets; some have national and international demand such as the avocado, which is the product that occupies more surface at program level, being La Libertad and Piura the departments dedicated to the production of this fruit of national and international demand. The identified list of products has been grouped by regions or departments, based in the field work and data of the Economic and Statistics Studies Office of MINAG, based in the 2008-2009 harvest and the intention of sowing for 2009-2010 season. In Table 2.5-26 the representative cultivation list of the present Program is shown.

Table 2.5-26
Harvested areas in the districts of the departments at the Program area (ha)

Crop	Amazonas	Ancash	Ayacucho	Cajamarca	Huancavelica	Huánuco	Junín	La libertad	Piura	Total General
Avocado	22	8	19	31				58,917	30,600	89,597
Potato	95	1,634	6,603	1,348	38	704	2,431	36,352	20,575	69,780
Rice	39,483							13,082	10,512	63,076
Sugar cane	101			522					52,023	52,646
Alfalfa		762	58	292	10	4	359	45,960		47,445
Other pasture			1,019	94					30,523	31,636
Olluco	16	215	520	142	12	27	528	19,059	3,788	24,307
Hard yellow maize	7,692		22	498		6		8,169	4,743	21,130
Mango	58	0						16,870	2,500	19,428
Wheat	13	3,355	1,926	2,061	19	214	212	4,810	3,054	15,663
Amillaceous Maize	53	1,595	2,240	2,911	3	539	210	4,542	2,573	14,666
Wheat			2,153	27			515	10,182	0	12,877
Choclo Maize	48	223	362	395		5	1,223	9,520		11,776
Barley grain	8	1,512	3,276	457	49	207	1,047	4,156	613	11,324
Garlic			73	50		2	29	7,450	1,933	9,537
Dry broad bean	3	434	1,211	51	31	94	160	4,064	3,000	9,048
Coffee	5,675			14				1,930	1,173	8,793
Dry sweet pea	8	213	814	586		5	52	4,279	2,162	8,118
Dry bean	593	170	43	1,124		6	5	3,560	2,340	7,840
Green sweet pea	27	33	454	2,330		21	1,376			4,241
Quinua		32	588		5	2	44	1,671		2,342

Green broad bean	9	10	396		7	2	320		826	1,570
Dry grain Chocho or tarhui	3	145	80	8		8		1,005		1,250
Yellow potato						694				694
Others	22,979	742	1,422	3,408	0	42	4,225	516,280	200,932	750,029

Source. DATA Office of Economics and Statistic Studies MINAG 2009

The most planted products in the study area were avocado and potato in Piura and La Libertad and rice in Amazonas.

Among these products the ones that have more commercial dynamics outside the limits of the regions are the following: Mango, coffee, avocado, beans and sugar cane.

Also, many potential products have been identified that are part of the analysis of cultivation products; they were defined in each zonal agency of AgroRural together with the farmers at the zones conforming the Program area. Table 2.5-27 shows transitory daily crops as well as permanent crops.

Table 2.5-27
Main potential products identified in each Project

a. Transitory crops

Crop	Area (ha)
Rice	13,880.00
Potato	8,264.35
Amillaceous maize	7,835.74
Pasture	7,495.00
Dry sweet pea	3,691.01
Artichoke	3,462.95
Bean	2,480.00
Wheat	2,022.53
Barley	1,867.99
Dry broad bean seco	1,705.83
Choclo maize	1,445.52
Tarwi	1,445.00
Vegetables	1,320.00
Green broad bean verde	1,166.01
Soya	889.34
Green sweet pea verde	758.8
Quinua	308.8
Coffee	250
Olluco	237.11
Oatmeal	227
Total	60,752.00

b. Permanent crops

Crop	Area (ha)
Alfalfa	1,572.80
Sugar cane	1,133.00
Grape	1,000.00
Avocado	750
Tara	585
Alfalfa (maintenance)	365
Apple	300
Barley	275
Mango	200
Lemon	150
Fruits	135
Banana	50
Flower	43
Peach	32.6
Orange	20
Total	6,611.00

2.6 Objectives of the project

The central objective of the project is "**Increase agricultural production of rural families in zones of poverty**"; meaning that with the present program it is intended that organized farmers

at a defined space in the sierra, increase their levels of agriculture production and productivity, using irrigation in an efficient and sustainable way.

In order to achieve the central objective or the purpose of the Program, the following specific objectives have been identified:

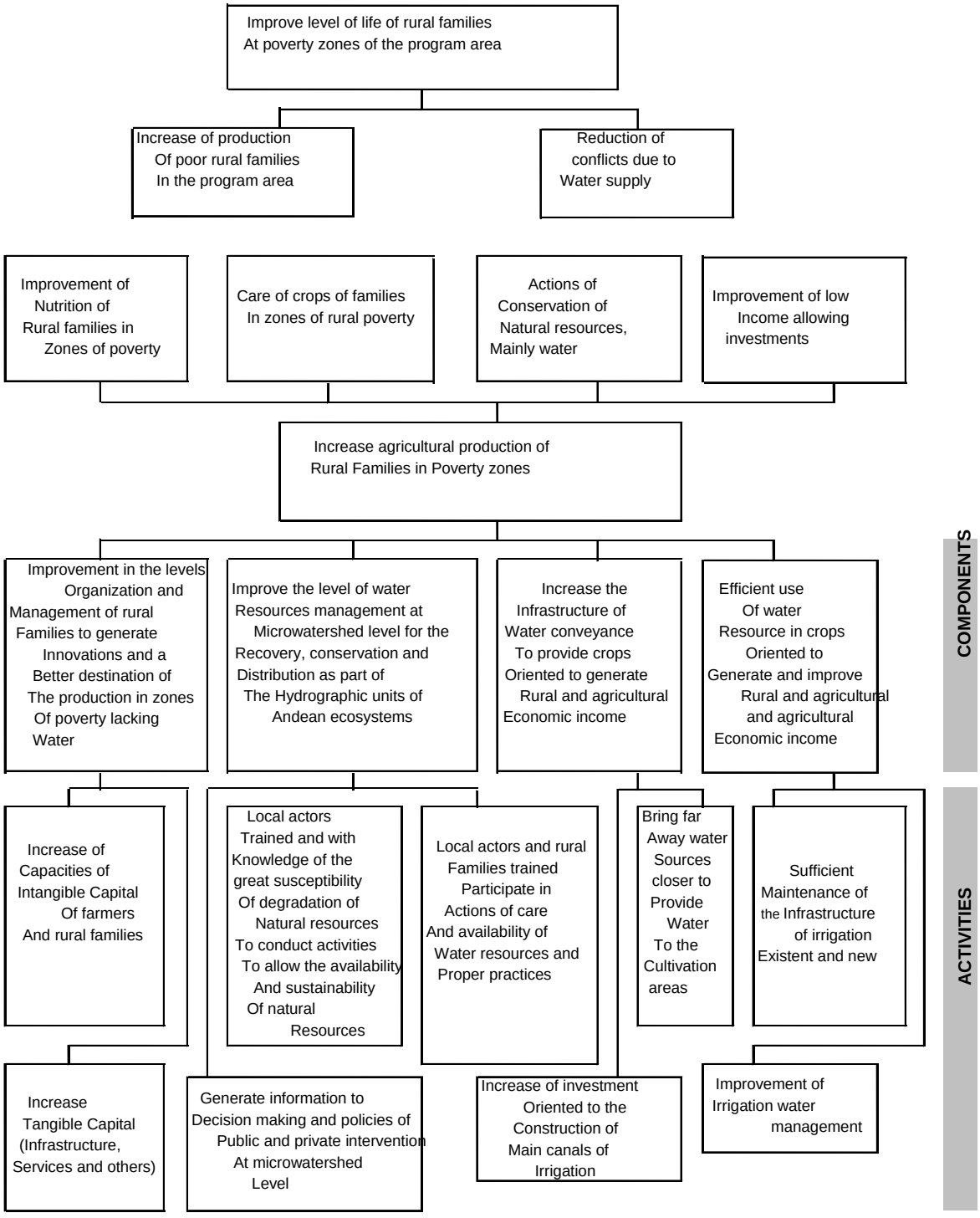
1. Increase water availability through the construction of irrigation Infrastructure for water conveyance and distribution, to provide for products oriented to generate agrarian and rural economic income.
2. Efficient use of water in crops oriented to increase agrarian and rural economic income.
3. Sustainable management of water resources at microwatersheds for planning the activities of Recuperation, Conservation and Distribution, by the actors in the microwatersheds, as part of the Hydrographic units of Andean Eco-systems
4. Organize and manage rural families to insert them in the economy of market as agricultural producers

In said Specific Objectives or Components the following Fundamental Means have been identified:

- Bring the far away water sources closer to provide water to the cultivation areas.
- Sufficient maintenance and operation of the existing irrigation Infrastructure and new irrigation infrastructures.
- Increase the capacity of intangible capital of farmers and rural families.
- Local actors trained and with knowledge about the great susceptibility of degradation of natural resources, to conduct activities to allow the availability and sustainability of natural resources.
- Trained local actors and rural families participate in actions of care and availability of water resources with proper practices.

For the execution of said means a series of activities have been foreseen that will allow the achievement of the goals and objectives of the Program; whose results will allow the improvement of irrigation for 18,073 hectares of cultivation and incorporate 20,659 hectares of cultivation, favoring in average the increase in the production of crops approximately 44%. Following the tree of objectives is presented.

TREE OF OBJECTIVES



CHAPTER 3
FORMULATIOIN AND EVALUATION

3. FORMULATION AND EVALUATION

3.1 Demand Analysis

a) Description of the area of influence of the program and objective population

The program area is located in 62 districts and 35 provinces of nine (09) departments of Peru such as: Amazonas, Ancash, Ayacucho, Cajamarca, Huanuco, Huancavelica Junín, La Libertad and Piura, the same that are shown as follows:

Table 3.1-1 Geographic Area of the Program

Department	Province	District	Department	Province	District
Amazonas	Bagua	1.Bagua	Cajamarca	Cajabamba	34.Condebamba
	Bagua	2.La Peca		San Miguel	35.San Silvestre de Cochan
	Chachapoyas	3.Balsas		San Pablo	36.Tumbaden
	Utcubamba	4. Bagua Grande		San Pablo	37.San Pablo
	Utcubamba	5.Cajaruro		Santa Cruz	38.Yauyucán
	Utcubamba	6.El Milagro		Santa Cruz	39.Andabamba
Ancash	Aija	7.Aija		Santa Cruz	40.La Esperanza
	Bolognesi	8.Huasta		Santa Cruz	41.Uticyacu
	Bolognesi	9.Aquio	Huancavelica	Huaytará	42. S.A. de Cusicancha
	Bolognesi	10.Pacllòn	Huánuco	Huánuco	43.Quisqui
	C. F. Fitzcarrald	11.San Luis		Yarowilca	44.Aparico Pomares
	Carhuaz	12.Acopampa	Junín	Concepción	45.Concepcion
	Huaylas	13.Caraz		Concepción	46.Sta Rosa de Ocopa
	Mcal.Luzuriaga	14.Llumpa		Concepción	47.S.J. de Quero
	Pomabamba	15.Huayllan		Concepción	48.Nueve de Julio
	Pomabamba	16.Pomabamba		Junin	49.Ondores
	Recuay	17.Recuay		Huancayo	50.Chicche
	Recuay	18.Catac		Chupaca	51.Yanacancha
	Recuay	19.Ticapampa		Tarma	52.Palcamayo
	Sihuas	20.Quiches		Tarma	53.Acobamba
	Sihuas	21.San Juan		Tarma	54.Palca
	Sihuas	22.Chingalpo		Tarma	55.Tarma
	Yungay	23.Ranrahirca		Jauja	56.Yauli
Ayacucho	Huamanga	24.Acocro	La Libertad	Sanchez Carrió	57.Chugay
	Huamanga	25.Chiara		Gran Chimu	58.Lucma
	Huamanga	26.Vinchos		Bolivar	59.Ucuncha
	Cangallo	27.Cangallo	Piura	Ayabaca	60.Ayabaca
	Cangallo	28.Ma Pa de Bellido		Ayabaca	61.Montero
	Cangallo	29.Los Morochucos		Huancabamba	62.Sondor
	Lucanas	30.Puquio			
	Vilcashuaman	31.Concepción			
	V.Fajardo	32.Huancapi			
	V.Fajardo	33.Huancaraylla			

Target Population

In terms of number of beneficiaries, the program would be attending 24,849 households, equivalent to 20.2% of the total of 123,171 households with unsatisfied condition in the

area of influence. Details are shown in the following Table:

Table 3.1-2
Population and beneficiary households in the Program area

Department	Household		
	Districts of the Program	Districts of the Program	% de Beneficiaries
Amazonas	27,563	2,164	7.9%
Ancash	20,070	8,926	44.5%
Ayacucho	19,074	4,640	24.3%
Cajamarca	9,644	1,640	17.0%
Huancavelica	439	76	17.3%
Huánuco	3,076	277	9.0%
Junín	24,456	5,191	21.2%
La Libertad	5,610	650	11.6%
Piura	13,239	1,285	9.7%
Total	123,171	24,849	20.2%

Source: Prepared from the diagnosis data

b) Tendency of using the public sector to intervene

The tendency of increasing area under irrigation through the public sector is solidly based in the present program, for according to information obtained from the III National Agrarian Census 1,984 of INEI, in the program area at department level there are a total of 928,845 ha supplied with irrigation, that is; equivalent to 31.92% of the total ha under irrigation and in dry land and 11.11% of the total of land under irrigation.

However, the goal proposed in the program is to maintain under irrigation 38,732 ha to benefit 24,849 families that tend to increase the total of ha under irrigation, considering that in year 1994, it totaled 967,577 ha as can be seen in Table N° 3.1-3.

Table 3.1-3 Areas under irrigation in the program area in ha

Nº	Department	Population	Production ha	Under irrigation ha	Rain fed ha	Technical Irrigation
1	Amazonas	389,700	159,934	25,183	134,752	35
2	Ancash	1,039,415	304,328	150,726	153,602	8,321
3	Ayacucho	619,338	208,336	84,477	123,859	3,992
4	Cajamarca	1,359,023	618,210	122,514	495,695	1,820
5	Huancavelica	447,054	219,795	61,784	158,011	900
6	Huánuco	730,871	390,459	54,953	335,506	724
7	Junín	1,144,603	356,255	41,365	314,890	380
8	La Libertad	1,423,090	407,790	210,872	196,917	26,290
9	Piura	1,630,772	244,360	176,969	67,391	60,691
Total		8,783,866	2,909,467	928,845	1,980,622	103,153

Source: INEI - III National Agrarian Census 1994

C) Description of the general characteristics of demand

Following, the description of the contents of each demand component of the program is presented:

1) Component A: irrigation infrastructure.

This component is oriented to develop activities of the program to increase agricultural production through the construction and/or improvement of irrigation infrastructure, training in operation and maintenance of irrigation infrastructure, as well as its use in lot irrigation and the promotion of technical irrigation; besides the conformation of irrigation committees to support them as organization to the ANA; other complementary activities are the promotion of productivity organizations organized with the tools of product sales such as studies of marketing and productive chain weakness, being strengthened with the technical assistance to farmers that will implement their production through irrigation; all that will achieve the increase of agricultural production and improve life conditions for the beneficiaries in the 9 departments, where 56 projects of irrigation systems improvements or construction have been identified, considered in the diagnosis which represents the demand of the identified agricultural population. The list of projects is presented as follows.

Table 3.1-4 List and location of projects

CODE	NAME OF THE PROJECT	DEPARTMENT	PROVINCE
AMA-1	Mejoramiento del Sist. Riego Higuerones-San Pedro	Amazonas	Utcubamba
AMA-2	Mejor. del Sist. Riego San Juan Marañón-La Papaya	Amazonas	Utcubamba
AMA-3	Mejoramiento Bocatoma y Canal Limonyacu Bajo	Amazonas	Bagua
AMA-4	Mejoramiento del Sistema de Riego Utcuchillo - Canal Aventurero	Amazonas	Utcubamba
AMA-5	Mejoramiento del Sistema de Riego Naranjitos - Canal Naranjitos Nº. 02	Amazonas	Utcubamba
AMA-6	Mejoramiento del Sistema de Riego Naranjos - Canal El Tigre	Amazonas	Utcubamba
AMA-8	Mejoramiento del Sistema de Riego Goncha Morerilla - Canal Gonchillo Bajo	Amazonas	Utcubamba
AMA-9	Mej.Boc.Rev.Tramo Canal Comunal Huarangopampa	Amazonas	Utcubamba
AMA-10	Mejoramiento del Sistema de Riego Lumbay Balsas	Amazonas	Chachapoyas
AMA-11	Mejoramiento del Sistema de Riego Naranjos - Canal Naranjos	Amazonas	Utcubamba
AMA-12	Mejoramiento del Sistema de Riego El Pintor - Canal Abad.	Amazonas	Utcubamba
AMA-13	Mejoramiento Canal San Roque Watson	Amazonas	Bagua
AMA-14	Mejoramiento Canal Riego La Peca Baja - Canal Brujopata	Amazonas	Bagua
ANC-2	Mejoramiento del Canal de Irrigación Paron II	Ancash	Huaylas
ANC-3	Construcción Canal de Irrigación Casablanca- Jocosbamba – Quiches (Joquillo)	Ancash	Sihuas
ANC-4	Construcción Canal Rupawasi - Rosamonte	Ancash	Sihuas
ANC-5	Construcción Canal de Irrigación Sol Naciente de San Luis	Ancash	Carlos Fermin Fitzcarrald
ANC-6	Mej. y Ampliación del Canal de Irrigación Quishquipachan	Ancash	Carhuaz
ANC-9	Mejoramiento del Canal de Riego Quinta Toma	Ancash	Yungay
ANC-10	Const. Canal de Riego Aynin-Huasta	Ancash	Bolognesi
ANC-11	Construcción Canal Cordillera Negra	Ancash	Huaráz
ANC-12	Mejoramiento Canal Rurec	Ancash	Huaráz
ANC-16	Const. Sistema de riego Jatun Parco	Ancash	Bolognesi
ANC-17	Mejoramiento Canal Chuayas-Huaycho	Ancash	Pomabamba
ANC-18	Mejoramiento Chinguil - Cruzpampa	Ancash	Mariscal Luzuriaga
ANC-19	Sistema de Riego Mancan Aija	Ancash	Aija
ANC-20	Canal de Irrigación Desembocadero – San Miguel	Ancash	Sihuas
AYA-1	Construcción y Mejoramiento del Sistema de Riego Cangallo	Ayacucho	Cangallo
AYA-2	Construcción Sistema de Riego Ccocha-Huayllay	Ayacucho	Huamanga

AYA-5	Construcción de Presa y Sistema de Riego Chaqllani-Pucapampa	Ayacucho	Fajardo
AYA-6	Irrigación Papatapruna - Ccochalla	Ayacucho	Lucanas
AYA-9	Mej y Const. Sistema Riego Putacca Ccatun Pampa	Ayacucho	Vilcashuaman
AYA-12	Const. presa y sistema de riego Chito-Sachabamba y Quishuarcancha, Chiara	Ayacucho	Huamanga
AYA-13	Const. Canal y Represa Tintayccocha-Acoro	Ayacucho	Huamanga
CAJ-1	Construcción Canal de Irrigación El Rejo	Cajamarca	San Pablo
CAJ-2	Rehabilitación Canal El Huayo	Cajamarca	Cajabamba
CAJ-6	Construcción Canal La Samana - Ushusqui	Cajamarca	Santa Cruz
CAJ-7	Irrigación Cochán Alto	Cajamarca	San Miguel
HUA-1	Construcción Canal de Riego Caracocha	Huánuco	Huánuco
HUA-2	Construcción Canal de Riego Sogoragra Rondobamba	Huánuco	Yarowilca
HUANCA-3	Irrigación Cusicancha-Huayacundo-Arma-Huaytará.	Huancavelica	Huaytará
JUNIN-1	Mejoramiento Canal Achamayo	Junín	Concepcion
JUNIN-2	Irrigación Aywin	Junín	Concepción
JUNIN-3	Irrigación Cotosh II Etapa	Junín	Tarma
JUNIN-4	Mejoramiento canal Ranra Antabamba	Junín	Tarma
JUNIN-5	Mejoramiento Canal Sector Atocsaico	Junín	Junin
JUNIN-6	Construccion del Sistema de Riego Rupasha - Vista Alegre	Junín	Huancayo
JUNIN-7	Mejoramiento del Sistema de Riego de las Localidades de Yauli y Jajapaqui	Junín	Jauja
JUNIN-9	Mejoramiento Canal Mayuhuato - Huaracaya	Junín	Tarma
JUNIN-10	Canal de Riego Ninatambo	Junín	Tarma
LIB-1	Mejoramiento del Canal Sute Pututе	La Libertad	Bolivar
LIB-4	Mejor. Canal Riego Chuquillanqui-Shushipe	La Libertad	Gran Chimú
LIB-6	Represa Laguna Negra-Const. Canal de Riego Chugay	La Libertad	Sanchez Carrión
PIU-1	Canal de Irrigación Espíndola	Piura	Ayabaca
PIU-2	Mejoramiento Canal Sanguly	Piura	Ayabaca
PIU-5	Mejoramiento Canal Chantaco Huaricanche	Piura	Huancabamba

The present component has determined the reason for this demand, detailed as follows:

- **Improvement of existing irrigation systems**

  According to the National Agrarian Census of Peru III (1994), in the 9 Departments considered, there are approximately 444 thousand hectares, equivalent to 27 % of the cultivation land.

  Concerning irrigation systems, in Table N° 3.1-5, the inventory of existing irrigation infrastructure in each department is presented. Many of them require infrastructure improvement because it has no been possible to rehabilitate by lack of economic resources for operation; and others works but with low efficiency of conveyance caused by loss of flow and areas to irrigate.

Table 3.1-5
Number of Irrigation Infrastructures Identified by department

N°	Department	Population	Nº of Infrastructures of Irrigation Identified
1	Amazonas	389,700	191
2	Ancash	1,039,415	1,054
3	Ayacucho	619,338	886
4	Cajamarca	1,359,023	825
5	Huancavelica	447,054	918
6	Huánuco	730,871	299

7	Junín	1,144,603	226
8	La Libertad	1,423,090	688
9	Piura	1,630,772	860
TOTAL		8,783,866	5,947

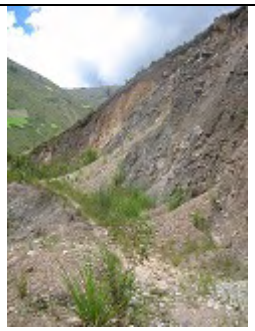
Source: MINAG DGIH /PERPEC

In the 9 departments there are approximately 5,947 irrigation systems. However, in most of them canals are unlined and others are deteriorated by lack of maintenance and many times, impossible to convey water to the beneficiaries' areas, for canals are not lined, causing great loss of captured flow that does no irrigate many production areas. Following, some examples of the bad state of the irrigation canals:

Canal covered with vegetation due to lack of maintenance. Frequent problem, solved with communal works
Chantaco-Piura

Canal destroyed by the effect of rocky sliding in the structure.

Santa Ana-Piura



Obstructed irrigation canal, without capacity to convey water. The canal route cannot be notices because it is covered by a lateral landslide / Chantaco-Piura

The demand for the improvement of irrigation systems is high for most of canals are not lined and the existing infrastructure is deteriorated by actions of nature and in some cases by lack of maintenance, making water distribution harder, with great loss of water resources. Besides, there is a high demand of irrigation infrastructure from communities to increase their production. It is estimated that around 90 % of the existing canals have no lining.

- **Incorporation of irrigation infrastructure in rain fed cultivation areas**

Rural population living at the Program area is mostly classified as in poverty or extreme poverty. The majority of producer farmers survive farming in small lots with insufficient production for self consumption. They require increasing agriculture production incorporating irrigation infrastructure to their rain fed cultivation land.

Farmers are not aware of irrigation techniques and the proper use of agronomic cultural tasks, they are not aware of modern techniques to increase production without affecting the economy. There is a population that demands much estimated in 70% of farmers, even so by including new products that requires the market but is not ready.

In Table N° 3.1-6 the results of the social survey conducted in three selected districts in the program area are shown.

Table 3.1-6
Income of producers in the program area (Unit; S/. per month)

Description	District Acocro Ayacucho	District Tumbadem Cajamarca	District Sondor Piura

Agriculture			
Production of Main Crops	617.3	82.2	183.2
Elaboration of Products or Sub-products	0.1	0.3	0.0
Sales of forest products	1.0	5.5	0.1
Animal farming			
Sales of cattle and others	11.8	133.8	55.0
Milk Production	4.7	222.3	84.1
Sales of Processed Products or Sub-products	26.5	2.6	0.4
Others			
Remittances	63.3	47.0	47.8
Other Income	211.8	59.9	57.0
Expenses			
Agricultural Activities	535.4	23.2	35.1
Animal Farming Activities	8.2	37.9	45.0
Family Net Income	392.9	492.4	347.5
Net Income per capita	106.7	143.0	101.4

Source: Survey, Study Team

- **Water resources demand**

Lack and/or insufficient irrigation infrastructure, low technological levels, inadequate water management, lack of organization, as well as minimum investments by private and public entities.

In the scope of the program, for projects located where there is rainy behavior in dry season, it is required that water resources are incorporated to productive areas to develop agriculture during the dry season.

Here we present a characteristic case of a project located in Ayacucho

Rainfall is mostly concentrated in the months of December to April. Annual average rainfall is approximately 700 mm.

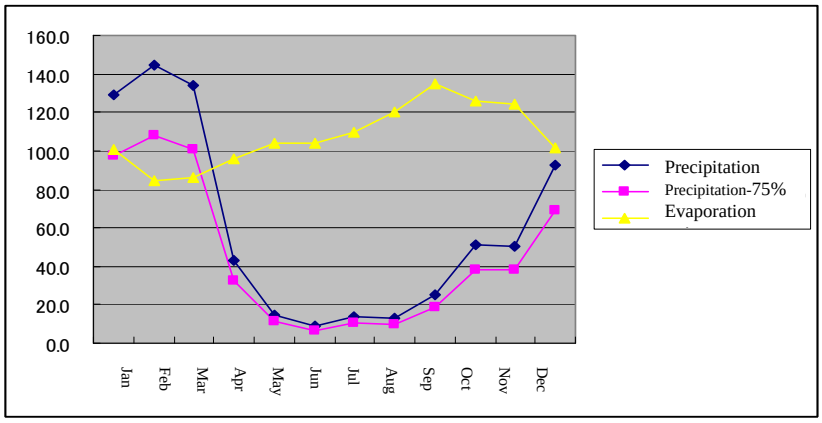
In the following Table the relationship between average rainfall and evaporation in the influence area of Project Cachi, province of Huamanga, department of Ayacuch is indicated.

In the case of Project Cachi, there is a water deficit from April to December. In this situation annual deficit is 790 mm, almost equivalent to annual rainfall. That means that in the sierra, to develop crops during April to December it is necessary to look for and manage water resources. In the following Table, the relation between rainfall and evaporation in the Project Cachi, Huamanga, in Ayacucho is indicated.

Table 3.1-7
Relation between Rainfall and Evaporation (In Project of Cachi, Huamanga, Ayacucho)
(unit; mm/month)

		1	2	3	4	5	6	7	8	9	10	11	12	Total
Rainfall	(a)	129.4	144.3	133.9	43.3	15.0	8.9	13.6	12.8	25.1	51.1	50.5	92.5	720.4
Rainfall -75%	(b)	97.1	108.2	100.5	32.5	11.2	6.7	10.2	9.6	18.8	38.3	37.9	69.4	540.3
Evaporation	(c)	100.4	84.4	86.4	95.5	103.9	104.1	109.9	120.5	135.2	126.2	124.7	101.4	1,292.4
Balance	(b)-(c)	-3.3			-63.1	-92.7	-97.4	-99.7	-110.8	-116.3	-87.8	-86.8	-32.0	-790.0

In terms of water resources, the month of September shows critical values. To incorporate new irrigation areas, it is necessary to look for sources to avoid risk of losing crops. It is estimated that the approximated value of water resources requirements in the case of Cachi project would be 790 mm per year. It should be mentioned that this figure changes depending on the regional characteristics. However, said requirement figures vary also depending on the water conveyance infrastructure conditions for zones of risk.



- **Conditions of irrigation infrastructure**

Water resources requirements depend also on infrastructure conditions. In the following Table, the efficiencies in Cachi project are indicated as example. Water resources required in said project, according to the present conditions of the canal are estimated as follows:

Table 3.1-8 Irrigation Efficiency for Different Conditions

Item	Bad maintenance conditions	Existing Condition	Condition with Canal Improvement
Efficiency of conveyance	0.40	0.87	0.95
Efficiency of distribution	0.50	0.55	0.77
Efficiency of application	0.40	0.42	0.55
Efficiency of irrigation *	0.08	0.20	0.40
Demand of net annual water resource (mm)	790	790	790
Required gross annual water resource (mm)	9,875	3,950	1,975
Water requirement in relation to the improved condition of the canal	5 times	2 times	-

Source: Survey, Study Team

As shown in the previous Table, water sources requirements are in function to the irrigation efficiency. Bad conditions of canals determine more quantity of water resources requirements. To attend the irrigation area it is necessary to improve canal conditions, the distribution system and the type of irrigation.

- **Water Demand of the Program's Projects**

The analysis of water demand for irrigation has been calculated for each one of the 9 departments of the program, considering the cases with project and without project (irrigation by gravity); for the analysis of demand the Hargreaves method has been used for the availability of meteorological (temperature, humidity and rainfall) and agronomical (crops, vegetative periods, area and consumptive use) information.

- **Meteorological Information**

In many projects the use of meteorological information has been considered as variables.

Monthly average temperature (° C),

Monthly effective rainfall (mm) at 75% of persistence (effective monthly average total rainfall was calculated with CROPWAT)

Relative humidity (%)

Data was obtained from stations located in the area of influence of the projects; said information has been collected from studies in the projects.

With said variables the potential monthly values of evapo-transpiration were determined (mm), as can be observed in the following Tables, evapo-transpiration and the monthly average rainfall at regional level.

Table 3.1-9
Potential Monthly Evapo-transpiration (mm/month)

DEPARTMENT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Amazonas	112.8	103.0	107.3	96.0	104.5	99.0	105.4	113.8	114.6	118.7	121.5	116.3
Cajamarca	100.8	90.4	97.3	93.9	98.9	125.7	138.0	140.1	126.6	117.5	109.5	106.6
Piura	102.3	100.0	107.6	102.0	99.8	94.8	92.7	112.2	111.9	118.1	114.0	116.6
La Libertad	106.6	93.2	105.1	97.8	89.9	83.1	89.6	100.4	108.0	110.4	111.3	111.6
Ancash	106.6	93.2	105.1	97.8	89.9	83.1	89.6	100.4	108.0	110.4	111.3	111.6
Huánuco	123.4	103.3	113.8	106.5	106.0	97.8	103.2	113.5	120.9	127.1	127.2	128.0
Junín	103.5	93.0	94.9	86.1	79.1	72.3	93.3	103.2	111.9	123.7	120.6	110.1
Huancavelica	103.5	93.0	94.9	86.1	79.1	72.3	93.3	103.2	111.9	123.7	120.6	110.1
Ayacucho	134.9	115.9	113.5	111.3	105.7	96.0	100.1	118.7	130.8	146.0	152.7	142.9

Source: FAO, CLIMWAT 2.0

Table 3.1-10
Effective monthly rainfall (mm) at 75%

DEPARTMENT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Amazonas	66.	79.9	100.0	68.3	40.0	20.3	18.4	20.3	50.2	72.7	66.8	63.7
Cajamarca	76.	82.6	88.0	72.0	36.6	8.9	5.0	9.8	36.6	79.2	74.9	67.5
Piura	43.	57.4	72.7	49.3	25.8	15.6	9.8	11.8	11.8	31.3	33.0	33.0
La Libertad	86.	84.0	95.1	59.0	17.5	1.0	1.0	5.0	13.7	44.3	40.0	55.8
Ancash	86.	84.0	95.1	59.0	17.5	1.0	1.0	5.0	13.7	44.3	40.0	55.8
Huanuco	46.	58.2	55.8	27.7	9.8	4.0	3.0	5.9	13.7	30.4	40.0	53.4
Junín	100	105.8	91.3	50.2	23.1	7.9	5.9	16.5	44.3	61.4	63.7	78.5
Huancavelica	100	105.8	91.3	50.2	23.1	7.9	5.9	16.5	44.3	61.4	63.7	78.5
Ayacucho	93.	91.3	81.9	29.5	12.7	7.9	5.9	11.8	25.8	37.4	40.0	63.7

Source: FAO, CLIMWAT 2.0

- **Information of cultivation area**

The approximate cultivation area has been estimated as indicated in the following Table, based on data of harvest areas in the program area

Table 3.1-11 Estimation of lots (ha)

Product	AMA	CAJ	PIU	LIB	ANC	HUANU	JUN	HUANCA	AYA	Total
Alfalfa	0	0	0	137	864	0	0	52	768	1,821
Potato	368	924	141	669	1,544	249	843	70	1,199	6,007
Barley grain	0	483	73	804	1,793	57	475	82	1,187	4,954
Amillaceous Maize	642	1,414	1,973	456	1,381	103	351	62	1,550	7,932
Green sweet pea	83	327	0	0	0	0	153	18	0	581
Wheat	91	1,075	1,101	853	2,285	68	275	30	891	6,669
Green broad bean	0	0	0	0	0	0	133	7	0	140
Dry sweet pea	0	528	463	211	0	0	0	17	291	1,510
Choclo Maize	95	0	0	0	900	0	305	0	0	1,300
Rice	2,942	0	0	0	0	0	0	0	0	2,942
Hard yellow maize	755	703	2,149	793	2,480	72	154	0	109	7,215
Cassava	888	302	135	0	0	29	188	0	0	1,542
Dry broad bean	0	0	0	116	203	24	0	22	443	808
Olluco	0	0	0	71	232	13	0	0	196	512
Sweet potato	0	0	111	0	0	0	0	0	0	111
Dry bean in grain	681	525	354	119	190	32	0	8	0	1,909
Coffee	3,412	0	895	0	0	0	3,131	0	0	7,438
Total Area	9,958	6,281	7,395	4,230	11,872	649	6,008	370	6,634	53,397

Source: Study Team based on MINAG data (2002 a 2007)

- **Agronomic Information**

Concerning agronomic information, there are the coefficients of consumptive use of each crop, which are rotation or second harvest crops, as well as the vegetative period of the same.

Other required information is the coefficients to consumptive use (Kc) of crops during the vegetative period. As in each project there are different products (maize, broad bean, sweet pea, wheat, etc.) a weighted average Kc for each month had to be calculated. The

Kc values of crops were obtained from the detailed design of irrigation projects at national level of ex - PRONAMACHCS and from CROPWAT database.

Table 3.1-12
Capacity of consumptive use of crops during the vegetative period

Product	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alfalfa	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
Potato	1.12	1.00	0.90							0.36	0.63	1.00
Barley grain	0.48	0.80	1.05	0.85	0.40							0.35
Amillaceous Maize	0.62	0.94	1.08	1.02	0.40							0.40
Green sweet pea	0.50	0.97	0.96	0.46								
Wheat	0.59	0.96	1.18	0.90	0.46							0.40
Green broad bean	0.96	0.46									0.50	0.97
Dry sweet pea	1.02	1.18	1.19	0.98	0.40						0.42	0.68
Choclo Maize	1.08	1.02	0.40							0.40	0.62	0.94
Rice	1.10	1.00	0.85								0.90	0.98
Hard yellow maize	1.08	1.02	0.40							0.40	0.62	0.94
Cassava	0.55				0.58	0.61	0.64	0.66	0.70	0.72	0.68	0.60
Dry broad bean	0.90	1.00	0.90	0.65	0.45						0.40	0.55
Olluco	0.85	1.00	0.75	0.60	0.35						0.25	0.55
Sweet potato	1.12	0.90	0.81							0.36	0.63	1.00
Dry bean in grain	0.84	1.00	0.95	0.75	0.28							0.36
Coffee	0.50	0.50	0.50	0.70	0.70	0.70	0.90	0.90	0.90	0.70	0.70	0.70

Source: AGRORURAL

Coefficients of consumptive use (Kc) of the second harvest products are shown in Table N° 3.1-13.

Table 3.1-13
Capacity of consumptive use of some products of the second harvest

Products	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potato				0.36	0.63	1.00	1.12	1.00	0.90			
Amillaceous Maize						0.40	0.62	0.94	1.08	1.02	0.40	
Green Sweet pea						0.40	0.66	1.10	0.80			
Green Broad bean						0.50	0.97	0.96	0.46			
Maize Choclo								0.40	0.62	0.94	1.08	1.02
Yellow hard Maize				0.40	0.62	0.94	1.08	1.02	0.40			

Source: AGRORURAL

- **Calculation of water demand and projections of component A**

With the potential monthly evapo-transpiration data, the weighted Kc and the effective rainfall at 75% and the respective areas, monthly water demand in volume was calculated (m3) for each month, obtaining the corresponding flow (Qd) in (m3/s).

Also the following conditions have been considered:

- Irrigation Efficiency of 20% (without project) and 40% (with project, irrigation by gravity).

- T Irrigation Period of 24 hours..

The summary of projected demand for the horizon of the program in the 9 departments for irrigation by gravity is shown in Table N° 3.1-14.

Table 3.1-14
Identification and projections of water demand

Department	Projections of water demand m3/sec									
	1	2	3	4	5	6	7	8	9	10
Amazonas (*)	14.918	14.918	14.918	14.918	14.918	14.918	14.918	14.918	14.918	14.918
Cajamarca	4.150	4.150	4.150	4.150	4.150	4.150	4.150	4.150	4.150	4.150
Piura(*)	1.715	1.715	1.715	1.715	1.715	1.715	1.715	1.715	1.715	1.715
La Libertad	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Ancash	5.918	5.918	5.918	5.918	5.918	5.918	5.918	5.918	5.918	5.918
Huánuco	0.437	0.437	0.437	0.437	0.437	0.437	0.437	0.437	0.437	0.437
Junín	3.693	3.693	3.693	3.693	3.693	3.693	3.693	3.693	3.693	3.693
Huancavelica	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183
Ayacucho	2.554	2.554	2.554	2.554	2.554	2.554	2.554	2.554	2.554	2.554
TOTAL:	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**

Own Source

2) Component: Institutional strengthening for water resources management

a) Demand analysis

The study comprises fifty high Andean microwatersheds located in the projects of component A, they have been delimited as microwatersheds under the criteria of the coding method created by Otto Pfafstetter, 1989. This concept groups watersheds by codes.

The Hydrographic units have been delimited by effects of determining the demanders of services where component "A" is going to be implemented, besides locating the districts beneficiaries of the project.

Table 3.1-15 Hydrographic units (UH) to be attended

Department	UH	Nº of PIP ("A")
Amazonas	10	13
Ancash	13	14
Ayacucho	7	7
Cajamarca	4	4
Huancavelica	1	1
Huanuco	2	2
Junín	7	9
La Libertad	3	3
Piura	3	3
Subtotal	50	56

Source: Prepared by AgroRural team.

Table 3.1-16 Location of microwatersheds to intervene by department

DEPARTMENT	MICROWATERSHED
AMAZONAS	COPALLIN
	EL PINTOR
	GONCHA
	JAHUAY
	LA PECA
	MARAÑON
	NARANJITOS
	NARANJOS
	UCTUBAMBA
	UTCUCHILLO
ANCASH	ACHIN
	ANDAYMAYO
	CHINGUIL
	JANCAPAMPA
	LLAMA
	ORELLOS
	PARÓN
	PATIVILCA
	RANRAHIRCA
	SAN MIGUEL
	SANTA
	SANTIAGO
	TAMBILLO
AYACUCHO	CHILQUES
	CHOCCUIHUALLCCA
	CONCEPCIÓN
	PACCHAMAYO
	PILPICANCHA
	TOJIASCCA
	VENTANILLAYOC
CAJAMARCA	CHANCAY
	CONDEBAMBA
	LLAPA
	REJO
HUANCAVELICA	TINCOC
HUANUCO	RAGRACANCHA
	SOGOPAMPA
JUNIN	ATOCSAYCCO
	CANIPACO
	CHIA
	HUAMBO
	JATUN HUASI
	RANRA
	TARMA
LIBERTAD	CHUQUILLANQUI
	PACCHA
	SUTE
PIURA	CHANTACO
	ESPÍNDOLA
	LOS MOLINOS

Component B presents the following activities demanded by the population and institutions in the microwatersheds to intervene. So, following the demand to strengthen activities of water resources management organizations in each microwatershed are indicated, considering the following:

b) Studies of Water Resources Characterization in Microwatersheds

The studies of water resources characterization in microwatershed to intervene have the purpose of determining the evaluation of the microwatershed and specify the strengths

and weakness and with that determinate future actions; there is an evaluation of said demand in the program.

In the specific case of water resources studies, they have to be conducted in territorial spaces named hydrographic watersheds, for they are the natural systems that comprise them. It is also considered that the territorial limits of the districts generally are established by natural formations such as hills or ravines (river), so usually limits of districts are coincident with the hydrographic microwatershed. But in many cases, the territorial space of a district is larger or smaller than one small microwatershed, sometimes covering two or three microwatersheds, or on the contrary, when two or three districts cover one microwatershed.

Peru has 1833 district municipalities, 927 are in the nine departments of the program intervention.

Table 3.1-17
Quantity of districts located in the program area at department level

Departments	Districts
Amazonas	83
Ancash	166
Ayacucho	111
Cajamarca	127
Huancavelica	94
Huanuco	76
Junín	123
La libertad	83
Piura	64
Total general	927

Source: INEI and GIS.

About these municipalities, the National Institute of Statistics and Systems, in the socio-demographic variables (http://www.inei.gob.pe) and municipalities with territorial arrangements by year and according to departments, has identified that only 152 districts have made some study of territorial arrangement between years 2004 to 2007.

Table 3.1-18 Studies of Territorial Arrangements by Department

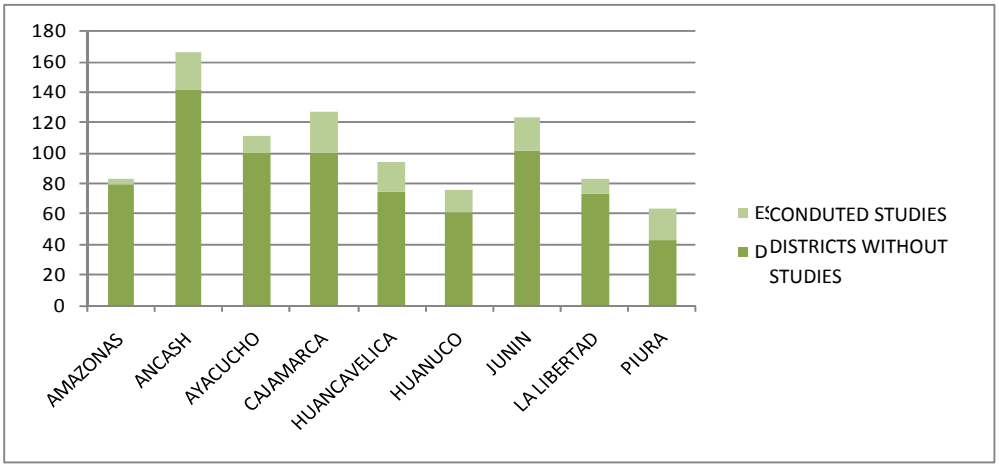
Departments /Municipality	Years				Total
	2004	2005	2006	2007	
Amazonas	0	3	0	1	4
Ancash	3	8	7	6	24
Ayacucho	2	2	1	6	11
Cajamarca	4	5	8	10	27
Huancavelica	1	4	4	10	19
Huánuco	4	2	4	5	15
Junín	7	5	7	3	22
La Libertad	2	3	2	2	9
Piura	2	4	8	7	21
Total general	25	36	41	50	152

Source: National Register of Municipalities -(RENAMU) 2004-2007

So, the demand would be located in 775 districts at the nine departments of the program where studies have not been conducted as seen in annexed diagram:

Table 3.1-19 Demand of studies by Microwatersheds

Departments	Nº Districts	Studies Conducted	Districts Without Studies
Amazonas	83	4	**79**
Ancash	166	24	**142**
Ayacucho	111	11	**100**
Cajamarca	127	27	**100**
Huancavelica	94	19	**75**
Huánuco	76	15	**61**
Junín	123	22	**101**
La Libertad	83	9	**74**
Piura	64	21	**43**
Total general	927	152	**775**



This demand is part of the water resources management in microwatersheds.

So we can indicate that characterization studies are required for the 50 microwatersheds because the ones executed do not correspond to the microwatersheds of the program.

c) Committees of Water Resources Management in Microwatersheds

The need to conform water resources management committees has been calculated considering the population living in the microwatersheds identified for the program, for said families will be directly affected by the shortage of water and much more if said resource is not going to be sustainable, either by an inadequate or inexistent management by the actors and local authorities interested in the sustained supply of the resource.

In relation to this situation, the program conducted a survey where the population shows interest to participate in the conformation of water resources management committees at microwatershed level; the percentage represented an affirmative answer of ninety five per cent.

Using the data of the population census of INEI-2007, it was possible to identify the populated units, but larger than 29 inhabitants. Data are shown below and are exclusively of populations under the condition: Settled population in the delimited microwatersheds is of 814,040 inhabitants.

Settled population is 813,941 inhabitants in microwatersheds that lives in 239,949 housings located in rural areas.

Table 3.1-20 Population and Housings in the 50 Microwatersheds

Department	Population	Housings
Amazonas	203,574	61,078
Ancash	215,482	66,126
Ayacucho	16,482	6,294
Cajamarca	182,198	51,749
Huancavelica	248	109
Huánuco	956	487
Junín	101,667	30,854
La libertad	90,747	22,563
Piura	2,587	689
Total general	813,941	239,949

Source. Prepared by AgroRural Team

The population in microwatersheds does not obey a political delimitation like districts or regions, so the previous Table can show information referring to the department of Lima but it is due to the fact that Microwatershed Canipaco is the location of project Jun-6 (Construction of Irrigation System Rupasha-Vista Alegre) which delimitation of microwatershed includes political territory of the Lima Region.

Population growth has been estimated in the intervention area according to the national average calculated by the National Institute of Statistics and Systems (http://www.inei.gob.pe). Annual average growth rate of the affected population at the program area is estimated with a rate of 1.6, and projection of 103,044 inhabitants for year 2015.

Table 3.1-21 Annual average population growth rate

Years	Annual average population growth rate
1961	1.9
1972	2.8
1981	2.6
1993	2
2005	1.5
2007	1.6

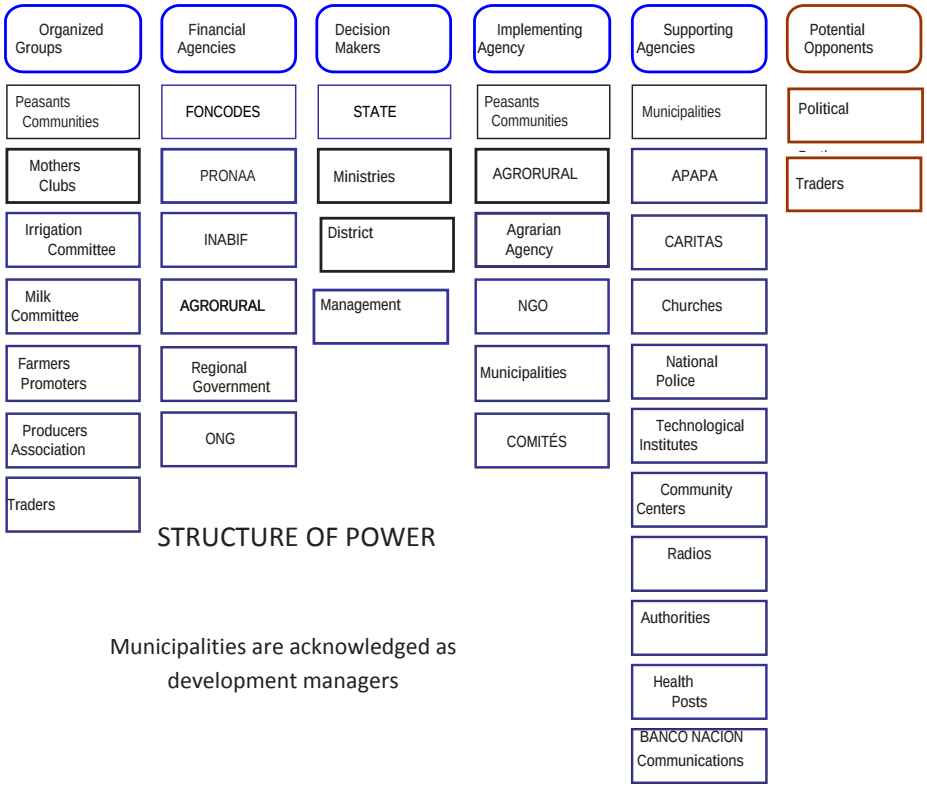
Source: INEI-National Census of Population and Housing, 1940, 1961, 1972, 1981, 1993, 2005 and 2007.

This projection of demand without project can vary the situation with project considering that actions to be carried out in the microwatershed would make that inhabitants of populations that have emigrated go back to occupy their territories for higher possibilities of competitiveness.

Table 3.1-22 Projection of affected population in the Program area

Department	District	Affected Population	Projection of Affected Population					
			2,010	**2,011**	**2,012**	**2,013**	**2,014**	**2,015**
Amazonas	Bagua Grande	862	879	885	890	896	902	908
	Balsas	1,378	1,405	1,414	1,423	1,433	1,442	1,451
	Cajaruro	2,677	2,730	2,747	2,765	2,783	2,801	2,819
	El Milagro	1,890	1,927	1,940	1,952	1,965	1,978	1,991
	La Peca	1,399	1,426	1,436	1,445	1,454	1,464	1,473
	Bagua	828	844	850	855	861	866	872
	Subtotal	**9,034**	**9,211**	**9,271**	**9,331**	**9,392**	**9,453**	**9,515**
Ancash	Acopampa	610	621	625	629	632	636	640
	Aija	1,638	1,668	1,678	1,688	1,698	1,708	1,718
	Catac	2,563	2,609	2,625	2,641	2,657	2,673	2,689
	Caraz	1,503	1,530	1,539	1,549	1,558	1,567	1,577
	Chingalpo	629	640	644	648	652	656	660
	Huayllan	1,290	1,313	1,321	1,329	1,337	1,345	1,353
	Huasta	543	553	556	559	563	566	570
	Llumpa	3,714	3,781	3,804	3,827	3,850	3,873	3,896
	Aquia	480	489	492	495	498	501	504
	Quiches	2,935	2,988	3,006	3,024	3,042	3,061	3,079
	Pacllòn	1,895	1,929	1,941	1,953	1,964	1,976	1,988
	Ranrahirca	354	360	363	365	367	369	371
	Recuay	2,863	2,915	2,932	2,950	2,968	2,985	3,003
	San Luis	2,825	2,876	2,893	2,911	2,928	2,946	2,963
	San Juan	9,206	9,373	9,429	9,486	9,542	9,600	9,657
	Ticapampa	2,829	2,880	2,898	2,915	2,932	2,950	2,968
	Pomabamba	1,290	1,313	1,321	1,329	1,337	1,345	1,353
	Subtotal	**37,167**	**37,840**	**38,067**	**38,295**	**38,525**	**38,756**	**38,989**
Ayacucho	Acocro	3,890	4,038	4,088	4,139	4,191	4,243	4,296
	Cangallo	549	570	577	584	591	599	606
	Concepción	609	632	640	648	656	664	673
	Chiara	7,071	7,339	7,431	7,524	7,618	7,713	7,810
	Huancapi	347	360	365	369	374	379	383
	Huancaraylla	212	220	223	226	228	231	234
	Ma Pa de Bellido	667	692	701	710	719	728	737
	Los Morochucos	663	688	697	705	714	723	732
	Puquio	253	263	266	269	273	276	279
	Vinchos	2,192	2,275	2,304	2,332	2,362	2,391	2,421
	Subtotal	**16,453**	**17,078**	**17,291**	**17,507**	**17,726**	**17,948**	**18,172**
Cajamarca	Condebamba	1,298	1,322	1,329	1,337	1,345	1,354	1,362
	San Silvestre	1,730	1,761	1,772	1,783	1,793	1,804	1,815
	Tumbaden	1,573	1,601	1,611	1,621	1,630	1,640	1,650
	San Pablo	874	890	895	901	906	911	917
	Andabamba	328	334	336	338	340	342	344
	La Esperanza	319	325	327	329	331	333	335
	Uticyacu	336	342	344	346	348	350	352
	Yauyucán	342	348	350	352	354	357	359
	Subtotal	**6,800**	**6,923**	**6,965**	**7,006**	**7,049**	**7,091**	**7,133**
Huancavelica	S.A. de Cusicancha	100	103	104	105	106	107	108
	Subtotal	**100**	**103**	**104**	**105**	**106**	**107**	**108**
Huánuco	Aparico Pomares	615	633	639	646	652	658	665
	Quisqui	512	527	532	538	543	548	554
	Subtotal	**1,127**	**1,160**	**1,172**	**1,183**	**1,195**	**1,207**	**1,218**
Junín	Concepcion	1,531	1,566	1,577	1,589	1,601	1,613	1,625
	Nueve de Julio	1,640	1,677	1,690	1,702	1,715	1,728	1,741
	Sta Rosa de Ocopa	1,753	1,793	1,806	1,820	1,833	1,847	1,861
	Chicche	287	294	296	298	300	302	305
	Yanacancha	302	309	311	313	316	318	321
	S.J. Quero	4,748	4,856	4,892	4,929	4,966	5,003	5,040
	Yauli	1,801	1,842	1,856	1,870	1,884	1,898	1,912
	Ondores	1,510	1,544	1,556	1,567	1,579	1,591	1,603
	Tarma	302	309	311	313	316	318	321
	Palca	264	270	272	274	276	278	280
	Acobamba	3,052	3,121	3,145	3,168	3,192	3,216	3,240
	Palcamayo	1,885	1,928	1,942	1,957	1,971	1,986	2,001
	Subtotal	**19,076**	**19,507**	**19,654**	**19,801**	**19,950**	**20,099**	**20,250**
La Libertad	Chugay	662	688	697	706	715	724	733
	Lucma	1,031	1,071	1,085	1,099	1,113	1,128	1,142
	Ucuncha	1,030	1,070	1,084	1,098	1,112	1,127	1,141
	Subtotal	**2,723**	**2,830**	**2,866**	**2,903**	**2,941**	**2,979**	**3,017**
Piura	Ayabaca	614	630	636	641	647	652	658
	Montero	1,541	1,582	1,595	1,609	1,623	1,637	1,652
	Sondor	3,016	3,095	3,122	3,149	3,177	3,205	3,232
	Subtotal	**5,171**	**5,307**	**5,353**	**5,400**	**5,447**	**5,494**	**5,542**
TOTAL		**97,629**	**99,960**	**100,743**	**101,533**	**102,330**	**103,133**	**103,944**

TREE OF STAKEHOLDERS IN THE MICROWATESHEDS



Additionally the way the population seeks organization has been identified, by associating themselves to be beneficiaries of the institutional and commercial nets or being part of them. It is estimated that in the determination of direct users the leaders or organizations /institutions will be the following, according to Table N° 3.1-23.

Table 3.1-23
Actors in the Management Committees of Water Resources in the Watersheds

Grassroots organizations (directors)	Population/ organizations	Organizations/ microwatershed	Population / microwatershed
Peasants Communities	7	5	35
Irrigation Committees	7	7	49
Mothers Club	8	5	40
Committees 1	5	5	25
Committees 2	5	5	25
Committees 3	5	5	25
Association 1	6	4	24
Association 2	6	4	24
Association 3	6	4	24
Subtotal	55	44	271

Source. Prepared by AgroRural Team.
Note: The quantities and actors are to be defined in the project investment stage.

Social participation is estimated in 271 actors (organization leaders) for each hydrographic unit (this data will be defined when the analysis of actors is carried out in the investment stage). Like the population living in the watershed, there are institutions

that work in the microwatersheds, but participants may or may not live in the watershed, but are affected by the problem.

Table 3.1-24
Actors and Institutions in the Microwatersheds

Institutions (persons present in the microwatershed)	Population / organizations	Organizations / microwatershed	Population / microwatershed
District Municipality	10	1	10
ALA	2	1	2
Users Board	6	1	6
Irrigation Committees	6	1	6
Agrarian Direction	4	1	4
SENASA	4	1	4
AGRORURAL	5	1	5
MINEDU, MINSA, MINDES	10	1	10
Financial Entities	2	1	2
Private Entities	3	1	3
NGO	4	2	8
External Actors			10
Subtotal	**56**	**12**	**70**

Source. Prepared by AgroRural Team.

As seen in Table N° 3.32, the participation of 70 institutions directly affected by the problem of development has been estimated including an average of 10 persons not living in the microwatershed, but whose participation in the solution of causes of the problem can be very important (`price takers, market fixers, among others)

Also when population in the high parts execute conservation practices, no one at the low parts acknowledges this effort, for in the case of the microwatersheds there is not a specific owner, so it is very important that decisions are made together by all actors concerned with water resources.

Table 3.1-25 Projection of Demand: Studies and Management Committees of Water Resources in the Microwatersheds

Unit of analysis	0	1	2	3	4	5
Projected demand in the need of Studies of microwatershed characterization at the 9 departments	**775**	**775**	**775**	**775**	**775**	**775**
Projected demand of Studies of water resources characterization in microwatersheds at the program	**50**	**50**	**50**	**50**	**50**	**50**
Demand of municipalities requiring committees of water resources management in microwatersheds at the 9 departments	**927**	**927**	**927**	**927**	**927**	**927**
Demand for organization of Committees of water resources management in microwatersheds of the program	**50**	**50**	**50**	**50**	**50**	**50**

So we can conclude that the demand for the second component is total for each microwatershed, up today there is not one organization that implemented it considering that in the 50 microwatersheds there are not any organization of water resources management.

3.2 Supply Analysis

a) Analysis and projections of water supply

Peru, a privileged country by water supply, has an yearly average volume of 2,46,287 m3 of water, being one of the 20 richest countries in the world, with 72,510 m3 /

inhabitant/year; however, the orography defines three hydrographic drainage basins unbalancing the spatial distribution, concentrating 97.7% of the volume at the Atlantic basin, where 30% of the population are settled, and produces 17.6% of the GNP, the 0.5% are located at the Titicaca basin, that have 5% of the population, producing 2% of the GNP and the remaining 1.8% is located at the Pacific basin, where paradoxically, 65% of the population is concentrated, producing 80.4% of the GNP

This unequal spatial distribution of water and seasonal variation determine significant differences in the availability of water resource; extreme aridity in the south Pacific drainage basin, moderate stress at the north Pacific and abundant at the Atlantic drainage basin. It determines that the Pacific drainage basin has to face great limitations in the availability of water, generating more conflicts related to access to water, being more frequent as the demands of the corresponding productive sectors increase. Moreover, the waste of water resources as well as water pollution caused by human activities can be added, to finally produce the exhaustion of the resource.

In said context, it is fundamental to incorporate the social dimension to the problem, highlighting the need of a renewed and efficient management of water resources, affecting in the knowledge of the hydrological cycle and its evaluation, to assure the efficiency in decision making.

Among the factors affecting the low productivity of agriculture sector and related to rural poverty, shortage of irrigation water can be mentioned, for sources are in the point of exhaustion, compromised or too far, requiring works of catchments, improvement and derivation that in many cases exceed the maximum limits of investments fixed by MEF.

Complementarily, the Peruvian State has defined its water resources policy in accordance to the International Decade for the action “Water, source of life”, established by the United Nations for the period 2005-2015, with the purpose of contributing to the achievement of the millennium development goals. This initiative of awareness rising has as purpose, to stress the importance of water in order to consolidate the relation of the national policy and strategy of water resources with the sustainable development, the eradication of extreme poverty and hunger, equity between genders, reduction of children mortality, health, education and environmental sustainability.

This design of policies is in accordance with the social and economic policies to be developed in the country for a period of three years as a short term policy tool, contained in the Multi-annual Macroeconomic Framework (MMM, in Spanish initials), prepared by the Ministry of Economy and Finance, MEF. Thus, in the field related to poverty and quality and destination of public investment, the MMM (2009-2011, number III) points out that: “Improve quality of public expenditure and management of public policies, giving priority to activities and projects with higher social cost-effectiveness and with the main objective of improving life quality of the poorest as long as they achieve the total inclusion in the regular dynamics of economic growth”. Likewise, in number IV related to the progress in social issues it points out that “Fight against poverty and improvement of several social indicators such as malnutrition, access and quality of education services, health and sanitation services are the fundamental objective of the macroeconomic policy.

In this framework of social policies, the Program of Small and Medium Irrigation Infrastructure in the Sierra will decisively contribute to the reinforcement of actions to improve income for an important portion of rural producers in the most run-down zones of the country, directly benefiting 24,849 families of said sector, and as consequence, improving their life conditions. Indirectly, it will benefit all population in the distinct

areas of influence of the projects to be executed, through the multiplier effect of the investments contained in the Program of Small and Medium Irrigation Infrastructure in the Sierra.

In Peru, several entities besides AGRORURAL conduct projects of irrigation infrastructure, such as Program of Irrigation Sub sector (PSI), MARENASS, and others.

In the framework of the Program of Economic Stimulation (PEE) amounting to 3.2% of the GNP, the government has assigned 153 million soles to the Program of Irrigation Infrastructure Maintenance (PMIR). It is a program executed by the Ministry of Agriculture with the object of financing the maintenance of irrigation infrastructure in the country, in order to contribute to strengthen agriculture. This Program is directly executed by district municipalities, as part of the anti-crisis plan being implemented by the central government.

The perception of the magnitude and spatial distribution of water use allows the ordainment, planning and improve the use of water resources in the country. In this context, inventories and basic studies have been prepared such as the ones conducted by the ex ONERN in 1984 and the General Direction of Water and Soils in 1992, establishing the national consumption of water, conformed by the consumptive use that reaches 20.072 m3/year, comprised by the agriculture sector with 80%; population and industry with and the mining sector with the remaining 2%; while the non consumptive use reaches 11.139 m3/year, constituted by the energy sector.

General guidelines of water resources policies in Peru are framed in a critical situation in terms of proper infrastructure, a weak regulation and national control. As supply from the government's side, there are two programs:

- Project of irrigation infrastructure (AGRORURAL)
- Project of rehabilitation and improvement of irrigation systems

In the sierra there is a project conduced by MINAG., this project is executed by AGRORURAL who assigns the largest investments to the execution of small works of irrigation infrastructure identified and given priority by the peasants organizations, in order to optimize the catchments, use and management of available water resources in the microwatershed.

The general strategy of intervention for the execution of said works is based in the following elements: i) Organization of users (beneficiaries) in en "work committees", users committees, etc.; ii) Provision of construction materials, tools and equipment, as well as the corresponding technical guidance; iii) Contribution of users, through non-paid communal labor work; iv) Training of users in the construction, operation and maintenance stage of the works and; v) Participation of the "work committee" in the joint administration of the resources assigned for the work.

Table 3.2-1
Project Irrigation Infrastructure MINAG -2007

Goal of the Project	Physical Goal			Budget (thous.S/.)	
	Unit	Prog/Mod	Obtained	PIM	Execution
Construction and Improvement of irrigation system					
Acquisition of Vehicles	Unit	51	51	146,7	146,7
Advisement and Consulting	Report	30	30	731,8	412,0
Technical Assistance	Report	4	4	9 052,2	9 052,2
Construction. Of small irrigation systems	Work	23.06	23.07	2 674,5	454,4
Coordination and advisements	Report	3	3	371,8	371,8
Technical direction, Supervision and Administration.	Report	14	14	6 336,0	6 334,3
Prep. Of Studies and update of detailed design	Study	741.05	52.05	1 890,2	1 792,3
Improvement of small Irrigation systems	Work	90.06	90.06	11 014,3	1 505,9
Construction of multiple use water systems	Work	2.06	0	41,1	0,0
TOTAL				32 258,6	20 069,6

Source: General Accounts of the Republic 2007

According to the exposed, we can indicate that AGRORURAL, institution constituted for the rural development of the country, has as objective the development and execution of projects in agricultural production to benefit rural population in poverty.

1) Component A: Irrigation Infrastructure

Water Supply of the projects

Water supply in the 56 projects considered in component A located in the 9 departments are presented in the following Table considering the water supply to catch and available by the rivers in the mountain, that are the sources.

Table 3.2-2 Water Supply of the 56 projects of component A

Code	**Project**	**Flow m3/s**
AMA-1	Improvement Irrigation Higuerones-San Pedro	1.45
AMA-2	Mejor. Irrigation system. San Juan Marañón-La Papaya	2.7
AMA-3	Improvement Intake and canal Limonyacu Bajo	0.915
AMA-4	Improvement Irrigation system Utcuchillo - Canal Aventurero	0.956
AMA-5	Improvement of Irrigation system Naranjitos - Canal Naranjitos Nº. 02	0.87
AMA-6	Improvement of Irrigation system Naranjos - Canal El Tigre	2.248
AMA-8	Improvement of Irrigation system Goncha Morerilla - Canal Gonchillo Bajo	0.13
AMA-9	Imp.intake Rev.Section Canal Comunal Huarangopampa	1.44
AMA-10	Improvement Irrigation system Lumbay Balsas	0.6
AMA-11	Improvement of Irrigation system Naranjos - Canal Naranjos	1.6
AMA-12	Improvement of Irrigation system El Pintor - Canal Abad.	0.874
AMA-13	Improvement Canal San Roque Watson	1.25
AMA-14	Improvement Canal of Irrigation La Peca Baja - Canal Brujopata	0.4
	sub total Amazonas	**15.433**
ANC-2	Improvement Irrigation Canal Paron II	0.5103
ANC-3	Construction Canal of Irrigation Casablanca- Jocosbamba – Quiches (Joquillo)	0.45
ANC-4	Construction Canal Rupawasi - Rosamonte	0.25
ANC-5	Construction Canal of Irrigation Sol Naciente de San Luis	0.8

ANC-6	Impr. And Extension of Irrigation Canal Quishquipachan	0.25
ANC-9	Improvement Canal of Irrigation Quinta Toma	0.25
ANC-10	Const. Canal of Irrigation Aynin-Huasta	0.42
ANC-11	Construction Canal Cordillera Negra	1
ANC-12	Improvement Canal Rurec	0.09
ANC-16	Const. Irrigation system Jatun Parco	0.5
ANC-17	Improvement Canal Chuayas-Huaycho	0.6
ANC-18	Improvement Chinguil - Cruzpampa	0.5
ANC-19	Irrigation systememma de Irrigation Mancan Aija	0.2
ANC-20	Irrigation Canal Desembocadero – San Miguel	0.1
	sub total Ancash	**5.92**
AYA-1	Construction and Improvement of Integral Irrigation system Pichcca Puquio-Urihuana-Llullucha-Tucsen, Pucaccacca- Huallchancca-Churropallana-Pacopata	0.31
AYA-2	Construction Irrigation system Ccocha-Huayllay	0.3
AYA-5	Construction of dam and Irrigation system Chaqllani-Pucapampa	0.33
AYA-6	Irrigation Papatapruna - Ccochalla	0.51
AYA-9	Impr. And Const. Irrigation system Putacca Ccatun Pampa	0.16
AYA-12	Const. Dam and irrigation system Chito-Sachabamba and Quishuarcancha, Chiara	0.65
AYA-13	Const. Canal and dam Tintayccocha-Acoro	0.32
	sub total Ayacucho	**2.58**
CAJ-1	Construction Canal of Irrigation El Rejo	1.5
CAJ-2	Rehabilitation Canal El Huayo	1.8
CAJ-6	Construction Canal La Samana - Ushusqui	0.35
CAJ-7	Irrigation Cochán Alto	0.55
	sub total Cajamarca	**4.20**
HUA-1	Construction Canal of Irrigation Caracocha	0.11
HUA-2	Construction Canal of Irrigation Sogoragra Rondobamba	0.38
	sub total Huancayo	**0.50**
HUANCA-3	Irrigation Cusicancha-Huayacundo-Arma-Huaytará.	0.20
	sub total Huancavelica	**0.20**
JUNIN-1	Improvement Canal Achamayo	1.50
JUNIN-2	Irrigation Aywin	0.45
JUNIN-3	Irrigation Cotosh II Stage	0.50
JUNIN-4	Improvement canal Ranra Antabamba	0.10
JUNIN-5	Improvement Canal Sector Atocsaico	0.19
JUNIN-6	Construccion of Irrigation systemem Rupasha - Vista Alegre	0.50
JUNIN-7	Improvement of Irrigation system in Yauli and Jajapaqui	0.21
JUNIN-9	Improvement Canal Mayuhuato - Huaracaya	0.16
JUNIN-10	Canal of Irrigation Ninatambo	0.10
	sub total Junin	**3.71**
LIB-1	Improvement of Canal Sute Putute	0.45
LIB-4	Impr. Canal Irrigation Chuquillanqui-Shushipe	1
LIB-6	Dam Laguna Negra-Const. Canal of Irrigation Chugay	0.5
	sub total La Libertad	**1.95**
PIU-1	Canal of Irrigation Espíndola	0.30
PIU-2	Improvement Canal Sanguly	0.42
PIU-5	Improvement Canal Chantaco Huaricanche	1.00
	sub total Piura	**1.72**

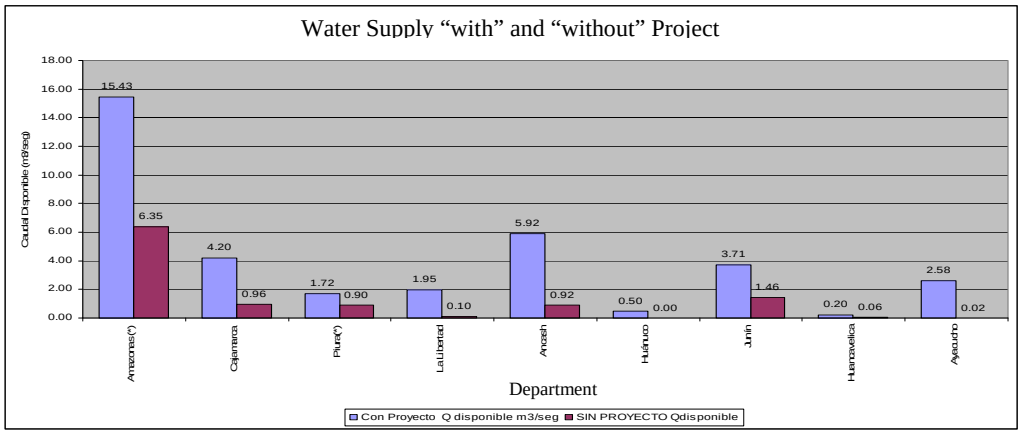
Projected Water Supply

The projected supply of water for the 9 departments is calculated at department level and will be constant for the flow is in m 3/s, allowed for each project, as can be appreciated in Table N° 3.2-3 and corresponding graphic.

Table 3.2-3 Identification and projections of water supply

Department	Projections of water demand m3/sec									
	1	2	3	4	5	6	7	8	9	10
Amazonas (*)	14.918	14.918	14.918	14.918	14.918	14.918	14.918	14.918	14.918	14.918
Cajamarca	4.150	4.150	4.150	4.150	4.150	4.150	4.150	4.150	4.150	4.150
Piura(*)	1.715	1.715	1.715	1.715	1.715	1.715	1.715	1.715	1.715	1.715
La Libertad	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950	1.950
Ancash	5.918	5.918	5.918	5.918	5.918	5.918	5.918	5.918	5.918	5.918
Huánuco	0.437	0.437	0.437	0.437	0.437	0.437	0.437	0.437	0.437	0.437
Junín	3.693	3.693	3.693	3.693	3.693	3.693	3.693	3.693	3.693	3.693
Huancavelica	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183
Ayacucho	2.554	2.554	2.554	2.554	2.554	2.554	2.554	2.554	2.554	2.554
TOTAL:	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**	**35.519**

Own Source



2) Component B: Strengthening the Water Resources Management in Microwatersheds

Supply Analysis

The supply analysis of Component B of the program, is framed within the institutional context of water resources of Peru, situation characterized by the lack of institutions that provide strengthening services in the different aspects and needs for water management and even less in the strengthening of technical capacities in water conservation, added to a lack of adequate irrigation infrastructure and a weak regulation and control; it is urgent that the same actors and local institutions assume the management of their water resources.

Other Institutions providing services

In the objective of the present component of the program, there are not institutions related to the same, excepting Ex-Pronamachcs that worked at the Sierra region and the last project PE-P27 ended in October of last year, having found fifteen committees of natural resources management of microwatersheds, but not specifically for water resources management.

Other institutions supporting the actions were the project GSAAC, project that has culminated, but it worked with larger watersheds and not at microwatersheds level in the program area. This project of Social Management of Water in the Watersheds Environment, was implemented as a second floor institution, through activities of training, exchange of experience, practices and others, using methods and contents accessible to all concerned, through the present technological advancements of communication.

Other entities, although considering natural resources conservation in an organized way, did not manage the conformation of committees at microwatersheds level, so in the program area we consider supply as zero in a situation without project.

There are different experiences of studies of watershed managements or attempts to systematize them as experiences of Territorial Ordainment, like IPROGA (Institute for the promotion of water management) and several NGOs. However the institutions directly involved with the problem of regulate and participate in water resources conservation since their origins are:

National Authority of Water, in charge of conducting actions for the multi-sector and sustainable use of water resources by watershed hydrographic units, in the framework of an integrated management establishing strategic alliances with the set of social and economic actors concerned.

The Institute of Geology, Mining and Metallurgy, is in charge among other aspects of investigating and conducting studies in geo-morphology, glaciology, and environmental geology, as well as studies of evaluation and monitoring of geologic dangers and assure the certification of thermal and medicinal waters in the Peruvian territory.

3.3 Supply – Demand Balance

1) Component A: Irrigation Infrastructure

Supply-Demand Balance of irrigation infrastructure

The importance of the program in the agricultural sector is rooted in the feasibility to conform a scenario of high agricultural production and productivity translated in better income for agrarian producers, in a framework of sustainability.

In the last years, rural population has not received enough support from the Central Government and irrigation infrastructure has increasingly worn out. That causes an increase in social cost determining loss of water resources and reduction of agricultural production.

<table>
<tr><th>Demand</th><th>Supply</th></tr>
<tr><td>Irrigation Infrastructure: : in the 9 Departments there are 5,947 irrigation infrastructures. Most of them are deteriorated. It is estimated that 90% have no lining</td><td>Improvement de Irrigation. . There are two projects at the supply side:
Project of irrigation infrastructure – AGRO RURAL.
Project of rehabilitation and improvement of irrigation systems.</td></tr>
<tr><td>By incorporation of irrigation in rain fed land. In the 9 Departments there are 1,658,431 ha of cultivation land and only 27% is irrigated. 73% is dry land with important demand for irrigation Average monthly income of farmers at the project area is very low. Survey conducted at three different Departments show the following income per month in nuevos soles (2009).
<table>
<tr><th>Acocro Ayacucho</th><th>Tumbadem Cajamarca</th><th>Sondor Piura</th><th>San Luis Ancash</th><th>Condebamba Cajamarca</th></tr>
<tr><td>106.7</td><td>143.0</td><td>101.4</td><td>91.1</td><td>161.8</td></tr>
</table>
In the same survey, it could be identified that lack of infrastructure was pointed out as the main problem by 39; 67 and 88% of the surveyed districts, respectively. In one of them, Acocro, 35% pointed out the lack of water as the origin of conflicts.</td><td>Increase in the availability of water resources. The Program of small and medium infrastructure in the sierra will be developed at 9 Departments, including 20 watersheds.</td></tr>
<tr><td>Infrastructure conditions. Irrigation quality is determined by the efficiency in conveyance, distribution and application. Presently, infrastructure is worn out, causing losses of water resources.</td><td>The Program includes improvement in efficiencies of conveyance, distribution and application. The exam of the agriculture situation in the 9 Departments indicates an insufficient supply.</td></tr>
<tr><td>Training The predominant irrigation method is furrow flooding that has low efficiency.
<table>
<tr><th>Item</th><th>Acocro %</th><th>Tumbaden %</th><th>Sondor %</th><th>San Luis %</th><th>Conde-bamba%</th></tr>
<tr><td>Furrow flooding</td><td>51.1</td><td>41.6</td><td>65.6</td><td>2.2</td><td>37.5</td></tr>
<tr><td>Gravity</td><td>20.7</td><td>9.5</td><td>34.4</td><td>66.8</td><td>62.5</td></tr>
<tr><td>Dripping</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td></tr>
<tr><td>Sprinkler</td><td>0.0</td><td>11.1</td><td>0.0</td><td>31.0</td><td>0.0</td></tr>
<tr><td>Others</td><td>28.1</td><td>37.8</td><td>0.0</td><td>0.0</td><td>0.0</td></tr>
</table>
The survey identified that 90% of the surveyed persons was interested in the conservation of water sources. Also, more than 59% have a disposition to pay for the use of water</td><td>Training in irrigation system management is a content of the Program, but small compared to the existing demand.
There is no sufficient supply to transfer knowledge and training in management of irrigation systems.</td></tr>
<tr><td colspan="2">Balance
Balance indicates an insufficient supply (Governmental Programs) in relation to the demand of producers to obtain water
Considering the dimension of land without irrigation, the supply (the Program) covers a marginal magnitude. The Program includes 56 sub-projects with the incorporation of 28 thousand ha; meaning only the 2.3% of the rain fed surface. The government goal is to reach year 2011 with 30% of average poverty in the country.
There is insufficient supply of irrigation infrastructure on the side of the Ministry of Agriculture and the decentralized entities. The same is valid for the case of regional and local governments.
Training is part of change and technological transfer. There is demand for it at the areas of the Program.</td></tr>
</table>

a) Water balance between supply and demand of water resource for component A

It results by comparing the minimum water availability in the dry season and the maximum demand corresponding to agricultural production.

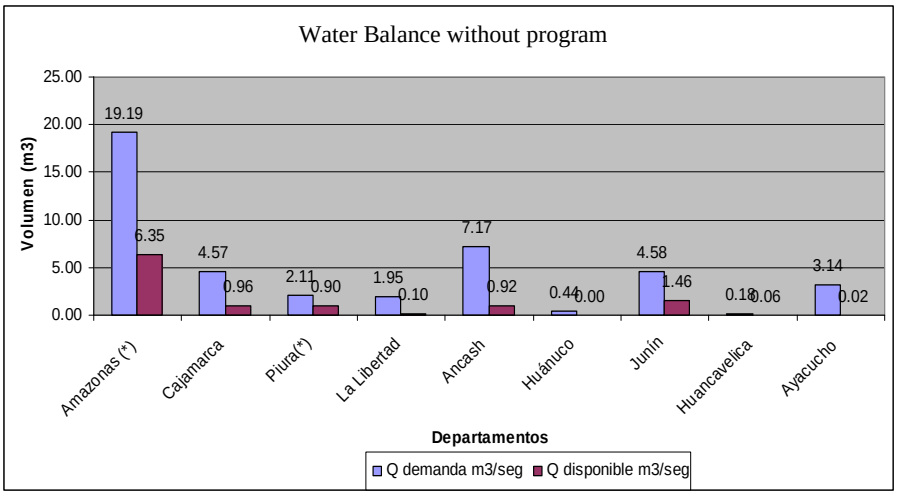
Table 3.3-1 Water Supply – Demand Balance of the 56 Projects

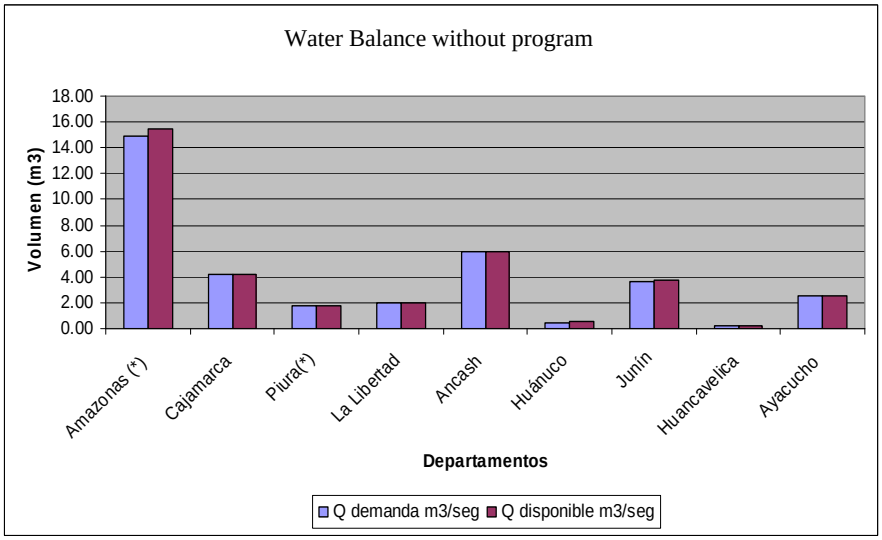
DEPARTMENT	WITHOUT PROJECT			WITH PROJECT		
	Q demand m3/s	Q Available m3/s	BALANCE +/-	Q demand m3/s	Q Available m3/s	BALANCE (+) (-) m3/s
Amazonas	19.19	6.35	**-12.85**	14.92	15.43	**0.51**
Cajamarca	4.57	0.96	**-3.61**	4.15	4.20	**0.05**
Piura(*)	2.11	0.90	**-1.21**	1.72	1.72	**0.01**
La Libertad	1.95	0.10	**-1.85**	1.95	1.95	**0.00**
Ancash	7.17	0.92	**-6.25**	5.92	5.92	**0.00**
Huánuco	0.44	0.00	**-0.44**	0.44	0.50	**0.06**
Junín	4.58	1.46	**-3.12**	3.69	3.71	**0.02**
Huancavelica	0.18	0.06	**-0.12**	0.18	0.20	**0.01**
Ayacucho	3.14	0.02	**-3.12**	2.55	2.58	**0.03**
TOTAL	**43.33**	**10.76**	**-32.57**	**35.52**	**36.21**	**0.69**

Source: Water Demand and Supply

The result of the water balance for the program, considering the minimum water supply in dry season and the maximum demand in the same period, shows the balance between water supply and demand for the situation with project.

Following, and for better understanding, the graphics of water balance, With and Without program are shown.





2) Component B: Strengthening of Water Resources Management in Microwatersheds

Supply and demand balance analysis of Component B

As it can be verified from the analysis both of requirements for the conformation of committees to manage water resources at microwatershed levels, and in studies to characterize them, they are necessary as a first step, to the projected sustainability that could be provided to water resources.

Table 3.3-2
Supply-Demand Balance of the Program, without project

Unit of analysis	0	1	2	3	4	5
Projected Demand of needs for Studies of Microwatersheds Characterization	50	50	50	50	50	50
Estimated Supply in situation without project	0	0	0	0	0	0
Balance Supply-Demand	50	50	50	50	50	50
Demand of Municipalities requiring Committees pf Water Resources Management in Microwatersheds	50	50	50	50	50	50
Estimated supply in situation without project	0	0	0	0	0	0
Balance Supply-Demand Committees of Water Resources Management in Microwatersheds	50	50	50	50	50	50
Balance Supply-Demand total	50	50	50	50	50	50

NOTE: The number of population representatives has been projected considering as base, figures of year zero.

Table 3.3-3
Supply-Demand Balance with project

Unit of analysis	0	1	2	3	4	5
Projected Demand of needs for Studies of Microwatersheds Characterization	50	50	50	50	50	50
Estimated Supply in situation without project	50	50	50	50	50	50
Balance Supply-Demand	0	0	0	0	0	0
Demand of Municipalities requiring Committees pf Water Resources Management in Microwatersheds	50	50	50	50	50	50
Estimated supply in situation without project	50	50	50	50	50	50
Balance Supply-Demand Committees of Water Resources Management in Microwatersheds	0	0	0	0	0	0
Balance Supply-Demand total	0	0	0	0	0	0

3.4 Technical Proposal of the Alternative

The technical proposal of the selected alternative in the Pre-feasibility Study of the program, is to properly use and maintain the water resource in microwatersheds considering water as a vital resource for the economy of farmer families, settled in microwatersheds at poor zones of the country; with the intervention of the present program through Agro Rural, national entity that has been executing projects at national level for more than 27 years, through institutions such as PRONAMACHCS, MARENAS, ALIADOS, etc., that has allowed to acquire important knowledge and experience in the development of activities of natural resources management, irrigation infrastructure, support to production, organization and markets, among other aspects that has helped to reduce poverty in the intervened places.

Components considered in the program are:

3.4.1 Irrigation Infrastructure to use water properly improving and incorporating new

technologies for the efficient use of water in agriculture production. It is in turn constituted by the following activities:

3.4.1.1 Detailed Design

Detailed designs will be grouped in 14 packages, according to the characteristics and complexity of project and executed with resources of the Peruvian State.

Detailed design have character of final studies and should be carried out according to the norms of quality and constructive design, approved by the International Consultant, financed with JICA's loan.

3.4.1.2 Infrastructure Works

Infrastructure works are to be executed by contract with resources of external debt and the national treasure, and the following sub-activities will be conducted:

Construction of irrigation works comprises two clearly defined situations:

- Improvement of irrigation infrastructure (Canals), has as objective to increase water conveyance efficiency avoiding loss of water by filtration due to inefficient irrigation infrastructure, in detriment of agricultural production and the economy of farmers

- Construction of irrigation infrastructure (dam, canals) to increase areas of agricultural production with permanent irrigation

In total, it comprises 56 irrigation projects, grouped in conglomerates of 37 projects with similar characteristics and 19 independent projects.

Environmental Management, in this sub-activity it is considered the mitigation of the negative impacts that could be originated with each project of irrigation, the same that will be executed by the construction companies.

General Expenses: this sub-activity considers the entire administrative and technical management for the execution of works and it is part of the constructing company expenses.

Supervision Expenses: this sub-activity is considered for the technical and financial control of the constructing company. For that, one professional for each work has been considered. The professional will have the technical responsibility for the execution of the irrigation project up to the culmination.

3.4.1.3 Training:

Conformation of Irrigation Committees, its importance is due to the necessity to organize beneficiaries in an irrigation users committee, to carry out water distribution and actions of operation and maintenance of the constructed infrastructure, covering reparation costs of canals, intakes, etc.

A committee of users is to be conformed for each project and a record of users will be prepared with the identification cards and area under irrigation and other relevant data. Users committees will have at least three authorities: president, treasurer and secretary, democratically elected in general assembly of users. The procedures for the official acknowledgement of the Local Water Administrations, organism belonging to the National Authority of Water (ANA) will be carried out.

Training in water management for operation, maintenance and lot irrigation; with this activity knowledge is expected to be transferred by training users of the Program's

projects in the operation and maintenance of the irrigation infrastructure, through the proper use of lateral gates and training in the preservation of the infrastructure; for that training workshops will be conducted with the distribution of manuals about the issue, these actions will allow the sustainability of the irrigation infrastructure. Likewise, in order to achieve the effective and efficient use of water, users will be trained in irrigation by gravity at lot level, according to the agrological characteristics of soils, gradients and according to the type of crop adopted.

Promotion of technical irrigation; it has as purpose to sensitize firstly the farmers about the goodness of technical irrigation as well as to know the operation and maintenance costs, that is achieved only by investing in profitable agricultural products; for that it has been considered that beneficiaries of irrigation works organize themselves to choose who will participate in the practices of technical irrigation promotion at the production areas with technical irrigation, to observe and learn about the installation, operation and maintenance of equipment, also to acquire knowledge about the benefits of the technical irrigation system and take the decision to invest in the implementation of technical irrigation in their lots. For that, we consider informing them about the entities and programs that may finance said implementation.

3.4.1.4 Promotion of Association for productivity

The beneficiaries of the program presently are disorganized or poorly organized. For that, it has been considered organizing them in each irrigation project to be intervened as small and/or medium agricultural producers, to achieve their incorporation in the local market with competitiveness. That is, to participate in the dynamics of marketing with products of better quality and larger quantities.

The considered sub-activities are the following:

Organized and formalized producers,

This activity will organize and formalize the beneficiaries of each irrigation project through workshops and legalization procedures as well as the election of the Direction Board.

Marketing studies and identification of the productive chain weakness,

Study of productive chain identification, this study will benefit previously organized producers, because they will be let known about the results and recommendations to improve the actions to be implemented to strengthen the productive chain of their products.

Marketing study, the present study will be useful for organized groups to know the characteristics: to whom and what to sell; in order not to loose their income,

For said activities, local consultants will be contracted with funds of the national treasure (ordinary resources).

3.4.1.5 Agricultural Technical Assistance

Agricultural technical assistance is directed to the beneficiaries whose productive areas

are to be incorporated with irrigation, that is for 20,629 ha, farmers who will be trained in how to develop agricultural production with irrigation; for that each technician will attend 100 ha and for each 7 technicians there will be one supervisor engineer; this activity will be developed during one year.

Technical assistance is mainly oriented to strengthen good agricultural practices, as the adequate use of authorized fertilizers, improved seeds, and cultural tasks and-post-harvest activities.

3.4.1.6 Lateral Canals

The construction of secondary and/or lateral canals are to be executed by the beneficiaries whose areas to incorporate irrigations are 20,629 ha; for that AGRO RURAL's technical assistance has been considered, through the decentralized offices, the amount considered for the execution of canals are to be considered as contribution to the Program's financing.

In conclusion, the activities of this component will establish a sustained increase of agricultural production supported in irrigation committees and producers associations strengthened by technical assistance.

3.4.2 Strengthening in the Management of Water Resources of Microwatersheds and in the organization of agricultural producers

This component is to be developed in microwatersheds at the irrigation project sites, using water as the vital element for farmers' economy; so Strengthening Water Resources Management in Microwatersheds has been considered important with the objective of preserving and making the proper use of water resources at microwatershed level. All these activities are to be supervised by experts in water resources management.

For that, the following activities have been established:

3.4.2.1 Preparation of detailed design for the execution of component B.

This activity is directed to determine the specific costs and actions of each activity by microwatershed. The same will be executed through consulting services in only one study for the 9 regions considered in the program. To be financed by the national treasure.

3.4.2.2 Study of water resources characterization in the Microwatershed

In this activity, the conduction of studies for each microwatershed to identify the availability of water resources and productive zones has been considered; that is it will be a study to allow the analysis of potentialities and weakness of the microwatershed as well as present conclusions and plans of development at the microwatershed referring to agricultural productivity actions.

3.4.2.3 Organizational Strengthening for Water Resources Management

This activity has as characteristic to organize water users at microwatershed level through the following activities:

3.4.2.3.1 Awareness rising of water users about the importance of water resources.

3.4.2.3.2 Organization and formalization of the committees for water resources management in the microwatershed.

3.4.2.3.3 The actions of the committees for water resources management are the conduction of workshops to train members of the committees for water resources

management in activities of water preservation and use, as well as strengthen actions of the committee management for the implementation of future activities.

3.4.2.3.4 Monitoring of Water Resources and Climate

This activity is important to evaluate water and climate behavior at the microwatershed because it allows to determine the behavior of water resources (reduction, increase or maintenance), to plan actions in the microwatershed; for that hydrometric stations will be installed in each microwatershed.

Also, automatic meteorological stations will be installed in each microwatershed to identify the agro-climatic variables influencing agricultural production, the same that will be communicated to farmers and so, complement their knowledge with the technical assistance considered in component A of the Program.

3.4.2.3.5 Recovering Knowledge

This activity intends to highlight and disseminate the positive results of the committees for water resources management, as well as the dissemination of monitoring and its application in agricultural activities and the presentation of the management plans of each committee.

3.4.3 Management of the Program

Program management is comprised by activities of technical and financial administration of the program; for that the following has been considered.

3.4.3.1 Administrative Management and Monitoring

These activities will be in charge of the Coordinating Unit of the Program, responsible for the technical and financial execution of the program, to establish the monitoring and follow up of components A and B activities; likewise the conduction of base line studies of the program, intermediate and final evaluation of program impact and auditing actions have been considered.

Also, administrative personnel have been considered for financial matters of the program.

3.4.3.2 International Technical Supervision

International technical consulting will be contracted by the Coordinating Unit of the Program, according to the modality of contract of the loan source JICA; it has the function of supporting and advising the coordination unit of the program in the execution of the program's activities.

So, the program proposal is targeted to fulfill the objectives of the program such as increase the socioeconomic level of the rural farmer in poverty and preserve water resources at microwatershed level.

3.5. Costs of the Program

3.5.1. Definition of the Program Costs Assumptions

Program Cost is comprised by three (03) categories of costs such as: investment costs, cost of operation and costs of maintenance.

Investment costs have been determined in three components:

Component A:

Infrastructure of irrigation

Component B:

Institutional Strengthening for the Management of Water Resources in Microwatersheds and

Component C:

Management of the Program. .

(1) Basic Condition for the Program Cost Estimation

The cost estimation of the program has been carried out from the following basic conditions:

a) Base Period, March 2009
b) Exchange rate from USD to Yen and Nuevo Sol, indicated as follows:
   1USD = 97.73 Yen (March, 2009)
   1USD = 2.87 Nuevos Soles (March, 2010)
   1Nuevo Sol = 31.2 Yen (March, 2010)
c) The Base Cost of Construction established in number (2)
d) Price increase
e) Unit prices include IGV calculated in a rate of 19% applicable to all goods and services attributable to the Program
f) Structure of Costs of the Program considers the following elements of cost
   - Cost of Basic Infrastructure
   - Cost of Administration
   - Consulting Services
   - Contingencies
   - Profits
   - Income Taxes
g) Construction prices will take as base the year 2009.

(2) Base of Costs Estimation of the Program

The Program has three (03) components:

Component A: Infrastructure of Irrigation,

Component B: Institutional Strengthening for Water Resources Management in Microwatersheds

Component C: Management of the Program

Component A: Infrastructure of Irrigation comprises the improvement and construction of irrigation installations: canals, reservoirs and other works to improve efficiency in water use. Also considers the irrigation infrastructure construction, elaboration of Studies (Detailed Design), Environmental Management, General and Administrative Expenses, Supervision Expenses, Training (O&M, lot irrigation, conformation of irrigation

committees, promotion of technical irrigation), Technical assistance and Promotion of Association for Productivity by each project of Component A. This system is oriented to increase crop productivity, save supply of water resources and improve use and distribution of irrigation water at lot level.

Component B: Institutional Strengthening for Water Resources Management in Microwatersheds consists in establishing coordination mechanisms between the Board of Irrigation Users, local governments and other social agents concerned to improve the management of water resources in microwatersheds. The process proposes to conduct: Studies of characterization of each microwatershed (studies of diagnosis, preparation of inventories and formulation of plans), Conformation and formalization of the Committees of Water Resources Management in Microwatersheds and Expenses for the confection of the component's detailed design.

Component C: Management of the Program contains actions and expenses for the administrative and monitoring process of the Program implementation, through the Coordinating Unit of the program and the international technical consulting.

The contents of the Program in the following Table classifies the activities by component; among them, those referred to the Infrastructure of Irrigation, grouping the sub-projects of the Program from the monetary viewpoint, according to the investment amount and the physical viewpoint, separating mono-constructive subprojects and / or improvement (canal) and dual (canal and dam):

Table 3.5-1 Contents of the Program

	Description of components		Selected Alternative
A	Projects of "Infrastructure of Irrigation"		**19**
	Type 1: projects (more than 10 million) only canal	Projects	2
	Type 2-A: projects (6 to 10 million) only Canal	Projects	1
	Type 2-B: projects (6 to 10 million) canal and dam	Projects	2
	Type 3-A: projects (3 to 6 million) only Canal	Projects	9
	Type 3-B: projects (3 top 6 million) canal and dam	Projects	5
	Conglomerate "Infrastructure of Irrigation"		**37**
	Type 4-A: project (1.2 to 3 million) only Canal	Projects	22
	Type 4-B: project (1.2 to 3 million) canal and dam	Projects	4
	Type 5: projects (less than 1.2 million) only Canal	Projects	11
	Total	Projects	**56**
	Demonstration Module "Technical Irrigation" 1 ha	Modules	75
B	Project "Institutional Strengthening for Water Resources Management in Microwatersheds"		
	Study	Microwatersheds	50
	Committee Water Resources Management in Microwatersheds conformed and strengthened conduct actions of water and productive resources management	Microwatersheds	50
	Total		
C	Management of the Program		
	Administration and Monitoring	Unit	1
	TOTAL	Program	1

1) Composition of Cost Component A: Infrastructure of Irrigation:

Component A costs comprise:
- Studies (detailed design)
- Direct cost of Works
  - Environmental Management.
  - General Expenses
  - Works Supervision
  - Training (Training in O&M, lot irrigation, conformation of irrigation committees, promotion of technical irrigation),
  - Technical Assistance
  - Promotion of Association for Productivity (organization, marketing studies, and studies of productive chain)
  - Utilities
  - Income Taxes

Following, the classification of costs in the program is explained:

(a) Detailed Design and other Studies

The Cost of Studies comprises Costs of Detailed Design and other complementary Studies.

The Cost of the Detailed Design has been estimated as 2 to 4% of the direct cost of works. Said instrument, whose utility is for public works contracting purposes, in charge of AGRORURAL, in its quality of bidding entity, comprises among others: bidding documents, descriptive memory, drawings and technical specifications, bill of quantities, unit prices and budget, studies (hydrologic, geologic, soils, environmental, etc., as

corresponds), polynomial formulas.

Direct cost comprises costs by concept of labor force, materials and equipment attributable to the irrigation infrastructure works that for the program is conformed by irrigation infrastructure works: catchments, storage, conveyance, distribution and a set of works oriented to the efficiency of the irrigations system and operation, as well as to make maintenance easier.

(b) Direct Cost of Works

The direct cost by labor force is derived from payment of wages made by the contractor (outsourced) to the personnel working in the execution of the irrigation infrastructure works.

The direct cost of materials corresponds to the payment made by the contractor (outsourced) to purchase all material necessary for the right execution of the works, fulfilling the same quality of the technical specifications.

The direct cost by construction equipment and tools is derived from the right use of the proper equipment and tools necessary for the execution of the irrigation works, according to the stipulations of the norms of quality and technical specifications.

(c) Environmental Management

Environmental management costs considers by concept of mitigation, the negative impacts of each project, as well as the actions for the follow up or surveillance, contingency, environmental citizen participation and culmination plan.

(d) General Expenses

General expenses of works are estimated as 5% to 10% of the construction in average, considering the type of works to execute. General Expenses are those indirect costs linked to the administration of irrigation infrastructure works execution that do not intervene directly in the construction process but serves as support or complement to achieve the goals or objectives and may be executed in the work site or from other installations, derived from the same activity. This expense cannot be included in the items of works or direct costs. General expenses can be fixed expenses and variable expenses. Variable general expenses may include the responsible or manager of the work, storage keeper, watchmen and the technical assistance as work resident, foreman, depending on the execution period. Fixed general expenses are financial expenses not depending on the works execution period.

(e) Supervision

The program has planned the direct cost of the supervision and culmination of works. Among the minimum functions oriented to this supervision, it is recommended to consider:

- Programming, Execution and Control of budget for the expenses of supervision and culmination, according to the investment program.
- Consolidate the information of physical financial progress of the Initial Opening Budget, etc.
- Work culmination

(f) Expenses of Training, technical assistance and conformation of Irrigation Committees

Expenses with Training, technical assistance and conformation of Irrigation Users Committees refer to expenses in training events and oriented to the use of techniques for operation and maintenance, management and extension in technical irrigation by gravity. Said training costs are estimated in 5% of the direct cost considering the nature and type of work to be executed. (See annex Cost)

(g) Utility

It is defined as an estimation of 10 % of the total cost of investments of each project. In the program, utilities are estimated in 10%, considering the type of works to be executed. Said utilities are not applicable in case of works to be executed by direct administration.

(h) Taxes, it considers a 30% of the generated utility.

General Plan

The general plan of the program considers the execution of component A by contract and the component B by direct administration.

Table 3.5-2 Table of Irrigation Infrastructure Components Costs at Private Prices

	ACTIVITY	UNIT	QUANTITY	TOTAL
	COMPONENT A IRRIGATION INFRASTRUCTURE			**174,484,702.09**
I	**DETAILED DESIGN AND STUDIES**	**UNIT**	**56**	2,177,963.00
II	**INFRASTRUCTURE**			**154,055,290.45**
	IRRIGATION WORKS	**UNIT**	**56**	133,189,041.54
	ENVIRONMENT	**UNIT**	**56**	382,563.76
	GENERAL EXPENSES	**UNIT**	**56**	6,719,923.55
	SUPERVISION EXPENSES	**UNIT**	**56**	13,763,761.60
III	**TRAINING**			**2,622,405.38**
	CONFORMATION OF IRRIGATION COMMITTEE	**UNIT**	**56**	63,845.00

	TRAINING IN WATER MANAGEMENT O&M AND LOT IRRIGATION	**UNIT**	**56**	421,594.78
	PROMOTION OF TECHNICAL IRRIGATION	**UNIT**	**56**	2,136,965.60
IV	**PROMOTION OF ASSOCIATIVITY FOR PRODUCTIVITY**			**3,324,071.28**
	ORGANIZED AND FORMALIZED PRODUCERS	**UNIT**	**56**	892,311.28
	STUDY OF MARKETING AND PRODUCTIVE CHAIN	**UNIT**	**56**	2,024,960.00
	SUPERVISOR	**UNIT**	**56**	406,800.00
V	**ASSISTANCE**			**9,149,342.86**
	TECHNICAL ASSISTANCE	**UNIT**	**56**	9,149,342.86
VI	**LATERAL CANALS**			
	LATERAL CANALS	**GLOB**	**1**	3,155,629.12

2) Composition of Cost of Component B: Institutional Strengthening for Water Resources Management in Microwatersheds

The cost of Institutional Strengthening for Water Resources Management in Microwatersheds comprises:

- Elaboration of detailed designs for the execution of the component
- Elaboration of studies for the characterization of microwatersheds.
- Committee of Water Resources Management in Microwatershed conformed and strengthened conduct actions of productive and water resources management actions

Costs of strengthening are estimated by Microwatershed.

In the Program area there are 50 microwatersheds because some projects of the Program are located in the same microwatershed.

Table 3.5-3
Institutional Strengthening for Water Resources Management in Microwatersheds

	ACTIVIDAD	UNIT	Q'ty	TOTAL
	COMPONENT B STRENGTHENING WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS			17,994,250
I	DETAILED DESIGN FOR EXECUTION	UNIT	50	469,000
II	CHARACTERIZATION OF WATER RESOURCES IN THE MICROWATERSHED			6,603,568
	- IDENTIFICATION OF WATER RESOURCES AVAILABILITY AND ZONES OF PRODUCTIVE INTENSIFICATION / ANALYSIS OF CONFLICTS	UNIT	50	6,603,568
III	WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS COMMITTEE CONFORMED AND STRENGTHENED CONDUCT ACTIONS OF WATER AND PRODUCTIVE MANAGEMENT			10,921,682
	AWARENESS RISING FOR THE MANAGEMENT OF WATER RESOURCES IN MICROWATERSHEDS	Glob	1	954,655
	ORGANIZATION FOR THE CONFORMATION AND FORMALIZATION OF THE WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS COMMITTEE	Glob	1	1,356,078
	ACTIONES OF MANAGEMENT OF WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS COMMITTEE	Glob	1	2,115,446
	EQUIPMENT FOR MONITORING OF WATER RESOURCES AND CLIMATE	Glob	1	5,141,935
	RECOVERING KNOWLEDGES	Glob	1	1,353,568

4) Composition of Cost Component C: Management of the Program

Cost of administration, supervision and monitoring of the Program management.

Table 3.5-4 Cost of Component C : Management of the Program

	ACTIVIDAD	UNIDAD	CANTIDAD	TOTAL
	COMPONENT C			39,372,540.44
	ADMINISTRATIVE MANAGEMENT AND MONITORING	GLOB	1	26,708,844.80
	INTERNATIONAL SUPERVISION	GLOB	1	12,663,696
	SUBTOTAL			231,851,492.54
	CONTINGENCIES			6,833,333.39

Costs of the Coordination Unit are to be executed in AGRORURAL Headquarters, for that a technical and financial team has been considered. The budget for that is presented in the following Table.

Table 3.5-5 Cost of Administration-Monitoring in Headquarters

	DESCRIPCION	UNIT	Q'TY	COST UNIT.	COST TOTAL PRICE PRIV.	F.C	COST TOTAL PRICE SOC.
I	**MACHINARY A/O EQUIPMENT**						
	TRANSABLE						
	Computer	Nos.	11	4,500	49,500	0.84	41,597
	Vehicle 4x4 double cabin	Nos	0	90,000	0	0.84	0
	Printer+photocopy machine	Unit	2	8,000	16,000	0.84	13,445
	Multimedia equipment	Unit	2	6,000	12,000	0.84	10,084
II	**MATERIALS A/O INPUTS**						
	NO TRANSABLE						
	Office utilities	L.S	1	36,000	36,000	0.84	30,251
	Fuel	Gallon	30,816	12	369,792	0.66	244,063
	Office furniture	unit	11	350	3,850	0.84	3,235
III	**MONPOWER EXPENSE**						
	CLASSIFIED						
	NO TRANSABLE						
	CLASSIFIED						
	Coordinator for Program	M-M	60	12,000	720,000	0.909	654,545
	Assistant coordinator	M-M	60	5,000	300,000	0.909	272,727
	Coordinator for irrigation infra.	M-M	60	10,000	600,000	0.909	545,455
	Coordinator for Watershed	M-M	60	10,000	600,000	0.909	545,455
	Monitoring for irrigation infra.	M-M	60	5,000	300,000	0.909	272,727
	Monitoring for Watershed	M-M	60	5,000	300,000	0.909	272,727
	Administrator	M-M	60	8,000	480,000	0.909	436,364
	Accountant	M-M	60	5,000	300,000	0.909	272,727
	Finance	M-M	60	3,000	180,000	0.909	163,636
	Procurement specialist	M-M	60	3,000	180,000	0.909	163,636
	Secretary	M-M	60	3,000	180,000	0.909	163,636
	Driver	M-M	120	2,000	240,000	0.909	218,182
IV	**SERVICES**						
	TRANSABLE						
	Baseline survey Consultant	L.S	1	450,000	450,000	0.909	409,091
	Interim evaluation	L.S	1	400,000	400,000	0.909	363,636
	Final evaluation	L.S	1	450,000	450,000	0.909	409,091
	NO TRANSABLE						
	Auditor	L.S	4	200,000	800,000	0.909	727,273
	Operation cost	Month	60	500	30,000	0.84	25,209
						0.84	0
						0.84	0
						0.84	0
	Others	Number	174	40	6,960	0.84	5,848
	Washing and lubricants	Number	216	45	9,720	0.84	8,168
	SUBTOTAL				**7,013,822**		**6,272,809**

Administration

Administration costs include items described as follows, to be utilized in the Zonal Directions, considered in the Program Management. (See annex Costs of the Program)

- Vehicles (pickup trucks)
- Materials and input
- Computers
- Office supply
- Fuel and lubricants
- Payment of technical and administrative personnel

Expenses to be considered in the level of the 9 Zonal Directions of Agro Rural are for the technical and administrative personnel for activities follow-up in the Program's Components execution of works. Details are as follows.

Table 3.5-6 Cost of Administration-Follow up and Supervision of the 9 Zonal Directions

	DESCRIPTION	UNIT	Q'TY	COST UNIT.	COST TOTAL PRICE PRIV.	F.C	COST TOTAL PRICE SOC.
I	**MACHNARY A/O EQUIPMENT**						
	TRANSABLE						
	Computer	Nos.	27	4,500	121,500	0.84	102,101
	Vehicle 4x4 double cabin	Nos.	0	90,000	0	0.84	0
	Printer+Photocopy machine	Unit	9	8,000	72,000	0.84	60,504
II	**MATERIALS A/O INPUTS**						
	NO TRANSABLE						
	Office utilities	L.S	1	363000	363,000	0.84	305,029
	Fuel (*)	Gallon	524,009.40	12	6,288,113	0.66	4,150,154
	Office furniture	Unit	27	350	9,450	0.84	7,941
III	**MANPOWER EXPENSE**						
	SPECIALIZED						
	Coordinator for projects of program	M-M	486	8,000	3,888,000	0.909	3,534,545
	Coordinator for watershed	M-M	486	7,000	3,402,000	0.909	3,092,727
	Administrator	M-M	486	4,000	1,944,000	0.909	1,767,273
	Driver (*)	M-M	1404	2,000	2,808,000	0.909	2,552,727
IV	**SERVICES**						
	TRANSABLE						
	NO TRANSABLE						
	OPERATION COST	Month	486	500	243,000	0.84	204,202
	Water	Month	486	50	24,300	0.84	20,420
	Electricity	Month	486	60	29,160	0.84	24,504
	Fixed telephone line	Month	486	60	29,160	0.84	24,504
	internet	Month	486	100	48,600	0.84	40,840
	local	Month	486	500	243,000	0.84	204,202
	Others (*)	Nos.	1929	40	77,160	0.84	64,840
	Washing and lubricant (*)	Nos.	2324	45	104,580	0.84	87,882
	SUBTOTAL				**19,695,023**		**16,244,397**
	TOTAL				**26,708,845**		**22,517,206**

Total cost for the Coordination Unit of the Program is S/. 26`708,845.

Costs Of the International Technical Supervision

This is the technical and administrative support unit of the Coordinating Unit of the program that will assure the execution of the program to the debt source JICA. It is comprised by two levels A) foreign personnel b) local professionals under the responsibility of said international consultants. Following, the cost break down is described.

Table 3.5-7 Costs of International Technical Supervision

	DESCRIPCION	UNIT	Q'TY	COST UNIT.	COST TOTAL PRICE PRIV.	F.C	COST TOTAL PRICE SOC.
I	**MACHINARY A/O EQUIPMENT**						
	TRANSABLE						
	Computer	Nos.		4,500	0	0.84	0
	Vehicle 4x4 double cabin	Nos.	0	90,000	0	0.84	0
	Printer+Photocopy machine	unit		8,000	0	0.84	0
II	**MATERIALS A/O INSUMOS**						
	NO TRANSABLE						
	Office utilities	L.S			0	0.84	0
	Fuel	Gallon		12	0	0.66	0
	Office furniture	unit		350	0	0.84	0
III	**PERSON**						
	CALIFICADA						
	Team Leader	M-M	34	86,218	2,931,410	0.909	2,664,918
	Sr. Project Management Specialist	M-M	13	86,218	1,120,833	0.909	1,018,939
	Sr. Agronomist	M-M	6	86,218	517,308	0.909	470,280
	Construction Supervisor(1)	M-M	14	86,218	1,207,051	0.909	1,097,319
IV	**SERVICES**						
	NO TRANSABLE						
	Project Management Specialist (Co-T/L)	M-M	45	15,600	702,000	0.909	638,182
	Agronomist	M-M	18	15,600	280,800	0.909	255,273
	Watershed Management Specialist	M-M	0	15,600	0	0.909	0
	Design Engineer(1) for Supervision of Evaluation	M-M	5	15,600	78,000	0.909	70,909
	Design Engineer(2) for Evaluation of DD	M-M	27	15,600	421,200	0.909	382,909
	Expert for Irrigation Committee	M-M	5	15,600	78,000	0.909	70,909
	Specialist for Civil works(1)	M-M	43	15,600	670,800	0.909	609,818
	Specialist for Civil works(2)	M-M	24	15,600	374,400	0.909	340,364
	Agro Economist	M-M	4	15,600	62,400	0.909	56,727
	GIS Specialist	M-M	6	15,600	93,600	0.909	85,091
	Environmental Specialist	M-M	6	15,600	93,600	0.909	85,091
	Supervisor for civil works	M-M	0	8,000	0	0.909	0
	Office manager	M-M	43	4,000	172,000	0.909	156,364
	Secretary	M-M	43	4,000	172,000	0.909	156,364
	Translator	M-M	0	4,000	0	0.909	0
	Accountant	M-M	43	4,000	172,000	0.909	156,364
	Assistant engineer	M-M	124	4,000	496,000	0.909	450,909
	Computer Operator	M-M	126	4,000	504,000	0.909	458,182
	Office boy	M-M	43	4,000	172,000	0.909	156,364
	CAMIONETA SUP		28	77,490			
	NO TRANSABLE						
	International Airfare		12	22,660	271,923	0.84	228,507
	Domestic Airfare		90	1,200	108,000	0.84	90,756
	Domestic Travel		0	300	0	0.84	0
	Accommodation Allowance	Month	183	4,500	823,500	0.84	692,017
	Vehicle Rental	Month	83.33	8,000	666,640	0.84	560,202
	Office Rental	Month	48	6,500	312,000	0.84	262,185
	International Communications	Month	67	50	3,350	0.84	2,815
	Domestic Communications	Month	48	10	480	0.84	403
	Office Supply	Month	48	300	14,400	0.84	12,101
	Office Furniture and Equipment	Month	48	3,000	144,000	0.84	121,008
	Computer for Supervisor	Nos.	0	5,000	0	0.84	0
	SUBTOTAL				**12,663,696**		**11,351,269**

3.5.2 Investment Costs in the Situation Without Program.

Due to its singular characteristics, the nature of the program and the activities of construction and improvement of irrigation infrastructure and the absence of quantification of costs being assumed by this service, it is considered Zero, except for services of training and technical assistance of agriculture producers associations.

3.5.3 Costs of Investments in the Situation With Program

Costs of the single alternative for the execution of the program has been calculated in base of the proposal of unit costs and progress of formulation of project Perfil conforming the referred program; with an amount of S/. 238.684, 826 million of nuevos soles at market prices. The following Table summarizes the cost break down of the program investments by components at private and social prices:

Table 3.5-8
Investment Costs at Private Prices in S/. (Selected Alternative)

	ACTIVITY	UNIT	QUANITITY	TOTAL
	COMPONENT A INFRASTRUCTURE OF IRRIGATION			**174,484,702.09**
I	**DETAILED DESING AND STUDIES**	**UNIT**	**56**	2,177,963.00
II	**INFRASTRUCTURE**			**154,055,290.45**
	IRRIGATION WORKS	**UNIT**	**56**	133,189,041.54
	ENVIRONMENT	**UNIT**	**56**	382,563.76
	GENERAL EXPENSES	**UNIT**	**56**	6,719,923.55
	SUPERVISION EXPENSES	**UNIT**	**56**	13,763,761.60
III	**TRAINING**			**2,622,405.38**
	CONFORMATION OF IRRIGATION USERS COMMITTEE	**UNIT**	**56**	63,845.00
	TRAINING IN WATER MANAGEMETN O&M AND LOT IRRIGATION	**UNIT**	**56**	421,594.78
	PROMOTION OF TECHNICAL IRRIGATION	**UNIT**	**56**	2,136,965.60
IV	**PROMOTION OF ASSICIATIVITY FOR PRODUCTIVITY**			**3,324,071.28**
	PRODUCERS ORGANIZED AND FORMALIZED	**UNIT**	**56**	892,311.28
	STUDIES OF MARKETING AND PRODUCTIVE CHAIN	**UNIT**	**56**	2,024,960.00
	SUPERVISOR	**UNIT**	**56**	406,800.00
V	**ASSISTANCE**			**9,149,342.86**
	TECHNICAL ASSISTANCE	**UNIT**	**56**	9,149,342.86
VI	**LATERAL CANALS**	**GLOB**	**1**	3,155,629.12
	COMPONENT B STRENTHENING OF WATER RESOURCES MANAGEMETN IN THE MICROWATERSHEDS			**17,994,250**
I	**STUDIES FOR THE EXECUTION**	**UNIT**	**50**	469,000
II	**CHARACTERIZATION OF WATER RESOURCES IN THE MICROWATERSHED**			**6,603,568**
	- IDENTIFICATION OF THE AVAILABILITY OF WATER RESOURCES AND ZONES OF PRODUCTIVE INTENSIFICATION / ANALYSIS OF CONFLICTS	**UNIT**	**50**	6,603,568
III	**COMNITTEE OF WATER RESOURCES MANAGEMENT OF THE MICROWATERSHED CONFORMED AND STRENGTHENED EXECUTE ACTIONS OF WATER AND PRODUCTIVE RESOURCES MANAGEMENT**			**10,921,682**
	SENSITIZATION FOR THE WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS	**LS**	**1**	954,655
	ORGANIZATION FOR THE CONFORMATION AND FORMALIZATION OF THE WATER RESOURCES	**LS**	**1**	1,356,078

	MANAGEMENT COMMITTEE IN MICROWATERSHEDS			
	ACTIONS OF MANAGEMENT OF THE WATER RESOURCES MANAGEMENT COMMITTEE IN MICROWATERSHEDS	**LS**	**1**	2,115,446
	EQUIPMIENT FOR MONITORING WATER RESOURCES AND METEOROLOGY	**LS**	**1**	5,141,935
	RECOVERING KNOWLEDGE	**LS**	**1**	1,353,568
	COMPONENT C			**39,372,540.44**
	ADMINISTRATIVE MANAGEMENT AND MONITORING	**LS**	**1**	26,708,844.80
	INTERNATIONAL SUPERVISION	**LS**	**1**	12,663,696
	SUBTOTAL			**231,851,492.54**
	CONTINGENCIES			6,833,333.39
	TOTAL COST AT PRIVATE PRICES			**238,684,825.92**
	TOTAL COST AT PRIVATE PRICES IN DOLLARS			**83,165,444.57**
	EXCHANGE RATE S/. 2.87=1 DOLLAR			

EXCHANGE RATE 1.0 US$ = S/. 2.87 (End of March 2010 Banco Central de Reserva del Perú.

Table 3.5-9
Costs of Investments at Social Prices

	ACTIVITY	**UNIT**	**QUANITITY**	**TOTAL**
	COMPONENT A INFRASTRUCTURE OF IRRIGATION			**146,133,397.89**
I	**DETAILED DESING AND STUDIES**	**UNIT**	**56**	1,979,966.36
II	**INFRASTRUCTURE**			**127,417,849.26**
	IRRIGATION WORKS	**UNIT**	**56**	108,952,142.26
	ENVIRONMENT	**UNIT**	**56**	338,552.00
	GENERAL EXPENSES	**UNIT**	**56**	5,946,835.00
	SUPERVISION EXPENSES	**UNIT**	**56**	12,180,320.00
III	**TRAINING**			**2,320,712.73**
	CONFORMATION OF IRRIGATION USERS COMMITTEE	**UNIT**	**56**	56,500.00
	TRAINING IN WATER MANAGEMETN O&M AND LOT IRRIGATION	**UNIT**	**56**	373,092.73
	PROMOTION OF TECHNICAL IRRIGATION	**UNIT**	**56**	1,891,120.00
IV	**PROMOTION OF ASSICIATIVITY FOR PRODUCTIVITY**			**2,941,656.00**
	PRODUCERS ORGANIZED AND FORMALIZED	**UNIT**	**56**	789,656.00
	STUDIES OF MARKETING AND PRODUCTIVE CHAIN	**UNIT**	**56**	1,792,000.00
	SUPERVISOR	**UNIT**	**56**	360,000.00
V	**ASSISTANCE**			**8,317,584.42**
	TECHNICAL ASSISTANCE	**UNIT**	**56**	8,317,584.42
VI	**LATERAL CANALS**	**GLOB**	**1**	3,155,629.12
	COMPONENT B STRENTHENING OF WATER RESOURCES MANAGEMETN IN THE MICROWATERSHEDS			**16,006,256**

I	**STUDIES FOR THE EXECUTION**	**UNIT**	**50**	460,558.00
II	**CHARACTERIZATION OF WATER RESOURCES IN THE MICROWATERSHED**			6,009,246.49
	- IDENTIFICATION OF THE AVAILABILITY OF WATER RESOURCES AND ZONES OF PRODUCTIVE INTENSIFICATION / ANALYSIS OF CONFLICTS	**UNIT**	**50**	6,009,246.49
III	**COMNITTEE OF WATER RESOURCES MANAGEMENT OF THE MICROWATERSHED CONFORMED AND STRENGTHENED EXECUTE ACTIONS OF WATER AND PRODUCTIVE RESOURCES MANAGEMENT**			**9,536,451.51**
	SENSITIZATION FOR THE WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS	**LS**	**1**	845,478.92
	ORGANIZATION FOR THE CONFORMATION AND FORMALIZATION OF THE WATER RESOURCES MANAGEMENT COMMITTEE IN MICROWATERSHEDS	**LS**	**1**	1,217,420.32
	ACTIONS OF MANAGEMENT OF THE WATER RESOURCES MANAGEMENT COMMITTEE IN MICROWATERSHEDS	**LS**	**1**	1,898,980.81
	EQUIPMIENT FOR MONITORING WATER RESOURCES AND METEOROLOGY	**LS**	**1**	4,395,324.97
	RECOVERING KNOWLEDGE	**LS**	**1**	1,179,246.49
	COMPONENT C			**33,868,475.17**
	ADMINISTRATIVE MANAGEMENT AND MONITORING	**LS**	**1**	22,517,205.93
	INTERNATIONAL SUPERVISION	**LS**	**1**	11,351,269.24
	SUBTOTAL			196,008,129.06
	CONTINGENCIES			6,833,333.39
	TOTAL COST AT SOCIAL PRICES			**202,841,462.45**
	TOTAL COST AT SOCIAL PRICES IN DOLLARS			**70,676,467.75**
	EXCHANGE RATE S/. 2.87=1 DOLLAR			

3.5.4 Costs of Operation and Maintenance With and Without Program

The costs of operation and maintenance of the irrigation infrastructure at social and private prices are considered in the situation Without and With Program, referred to the proposed components, in charge of the beneficiary producers organizations properly organized in each district and province of the departments where the projects are located; said projected costs for the horizon of the program are expressed in the following Tables.

Table 3.5-10
Costs of Operation and Maintenance Without Program at Private Prices

DESCRIPTION/YEAR	1	2	3	4	5	6	7	8	9	10
TOTAL PROGRAM (S/P)	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**
Operation	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7
Maintenance	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9

Table 3.5-11
Costs of Operation and Maintenance Without Program at Social Prices

DESCRIPTION	AÑOS									
	1	2	3	4	5	6	7	8	9	10
TOTAL PROGRAM (S/P)	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**
Operation	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4
Maintenance	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9

Table 3.5-12
Costs of Operation and Maintenance With Program at Private Prices

DESCRIPTION	AÑOS									
	1	2	3	4	5	6	7	8	9	10
TOTAL PROGRAM (S/P)	**842,103.3**	**842,503.3**	**846,183.3**	**842,503.3**	**842,503.3**	**846,183.3**	**842,503.3**	**842,503.3**	**846,183.3**	**842,503.3**
Operation	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3
Maintenance	452,916.1	453,316.1	456,996.1	453,316.1	453,316.1	456,996.1	453,316.1	453,316.1	456,996.1	453,316.1

Table 3.5-13
Costs of Operation and Maintenance With Program at Social Prices

DESCRIPTION	AÑOS									
	1	2	3	4	5	6	7	8	9	10
TOTAL PROGRAM (S/P)	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**
Operation	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1
Maintenance	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7

3.5.5 Incremental Costs

Incremental costs, refers to the difference of the situation “Costs with Program” with the situation “Costs without Program”. They represent the difference of total costs of the alternative and costs of operation and maintenance With and Without Program from year 1 up to year 10.

Incremental costs are shown in the following Tables and for the discounted flow, a discount rate of 11% has been considered. It also includes the flow of costs at social prices where the correction factors as indicated in Annex SNIP – 09 of the National System of Public Investment have been used.

Incremental investment costs at private prices for year zero is S/. 198.4 million and S/. 165.8 million nuevos soles at social prices, as seen in the item investment costs.

Table 3.5-14
Incremental Costs of Operation and Maintenance at Private Prices

DESCRIPTION	PROJECTED YEAR									
	1	2	3	4	5	6	7	8	9	10
Cost for operation With/Proj	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3
Cost for operation Without/Proj	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7
Incremental operation cost	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**
Cost for maint. With/Proj.	452,916.1	453,316.1	456,996.1	453,316.1	453,316.1	456,996.1	453,316.1	453,316.1	456,996.1	453,316.1
Cost for maint. Without/Proj.	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9
Incremental cost for maintenance	**46,725.2**	**47,125.2**	**50,805.2**	**47,125.2**	**47,125.2**	**50,805.2**	**47,125.2**	**47,125.2**	**50,805.2**	**47,125.2**

Table 3.5-15
Incremental Costs of Operation and Maintenance at Social Prices

DESCRIPTION	PROJECTED YEAR									
	1	2	3	4	5	6	7	8	9	10
Cost for operation With/Proj	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1
Cost for operation Without/Proj	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4
Incremental operation cost	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**
Cost for maint. With/Proj.	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7
Cost for maint. Without/Proj.	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9
Incremental cost for maintenance	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**

According to the analysis, differential flow of costs for the program covers a horizon of 10 years. Estimated marginal flows result in the comparison under the differential approach of Situation without Program in respect to the alternative considered With Program, which flows are given by the difference of total costs covering investment costs and operation and maintenance costs With and Without Project from year 1 to year 10.

It should be pointed out that in each category of investment the defined components including training, supervision and assistance are considered.

Operation and maintenance costs of the program are to be assumed by the beneficiaries properly organized, with promoted and approved agreements during the execution of the projects.

3.6 BENEFITS OF THE PROGRAM

The Program will irrigate 38,732 ha, benefiting 24,849 farmer families, distributed in 9 departments, 35 provinces and 62 districts

Definition of Benefits of the Program

Said benefits are described for each component, as follows

Component A: Infrastructure of Irrigation

The goals and benefits of Component A works have been estimated in 38,732 ha benefiting 24,849 families.

The functioning of the projects works of this component are the following:

Water availability for productive areas is expressed in the following conditions:

a. Water saving in main canals to be lined (increase of 20% to 40% of efficiency in the application of irrigation water)

b. Increase of cultivated area in the lot, improving 18,073 ha and incorporation of new cultivation areas in 20, 659 ha.

c. Increase the intensity of land use in the lot, making it possible two to three crops per year.

d. Increase the value of agricultural land with the implementation of new irrigation infrastructure.

e. Organization and association of beneficiaries as agribusiness producers to compete in the markets

f. Knowledge in the application of technical irrigation with productive purposes for the implementation in the lots

g. Conformation of irrigation users Committees for each project of the Program

h. Knowledge of agronomic activities in the respective productive areas

Component B: Institutional Strengthening For Water Resources Management in Microwatersheds

Following, the benefits to be obtained with this component are described:

1. Conformation of Management committees for the proper management of water resources.
2. Knowledge in the management and proper use of water resources, identifying actors, criteria, objectives, strategies and execution and monitoring of programs in order to achieve a balance in the use of water resources, contributing to the environmental and economic balance in the population of the microwatershed.
3. Dissemination of agricultural and climatic information for the safety of agricultural products.

3.6.1 Benefits to be accounted

Benefits to be accounted comprise the increase in the production of agricultural products with the execution of Component A of the Program.

(1) Analysis of the Production Trend 2004-2008

Some products indicated in the list of crops of each department have been considered, both for the situation "without" project and future situation "with" project, taking into account the interest, level of acceptance and knowledge of products by farmers, according to the technological level and technical assistance services they will receive.

As can be observed in the following Table, national production of main products considered in the Program have being systematically increasing during the 2004-2008 period, process that is basic supported by internal economy dynamics, clearly visible during the last decade.

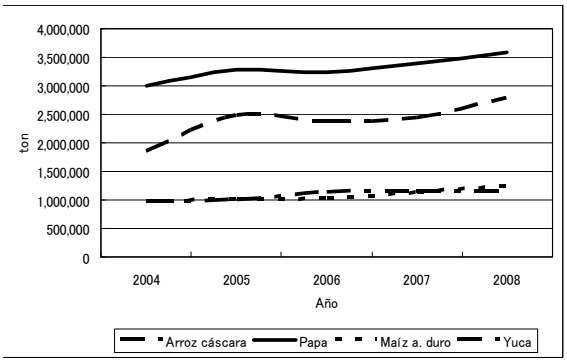
In the following figures, the tendency of production in metric tons for six crops during the period 2004-2008 at national level is shown.

Table 3.6-1
Production of Main Crops Since 2004 to 2008 National (Tm)

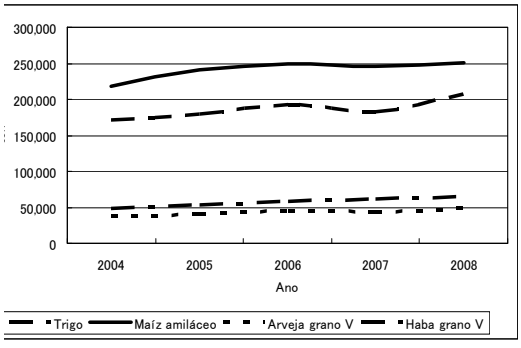
Crops	2004	2005	2006	2007	2008
Non peeled rice	1,847,999	2,468,357	2,363,498	2,435,134	2,782,700
Maize	217,717	241,506	249,169	245,326	250,558
Potato	3,005,770	3,289,699	3,248,416	3,383,020	3,588,086
Wheat	170,542	178,460	191,094	181,552	206,286
Yellow maize	982,944	999,274	1,019,806	1,122,918	1,228,593
Green Broad bean	47,176	52,881	57,501	61,325	64,249
Green pea grain	37,852	38,902	44,834	43,326	46,790
Cassava	974,767	1,004,454	1,138,553	1,158,042	1,146,525

Source: Monthly Agrarian Statistics, MINAG

Trend of Crops Production (2004-2008)



Trend of Production (2004-2008)



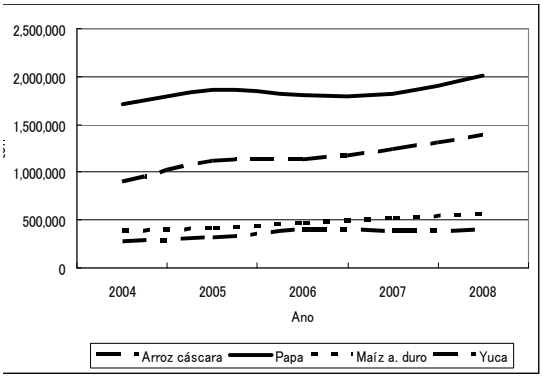
The same trend is seen at departmental level in the Program area, showing an average growth of 33% during the period 2004-2008, for the list of products shown in the following Table.

Table 3.6-2
Production of Main Crops in the Program Area(Tm)

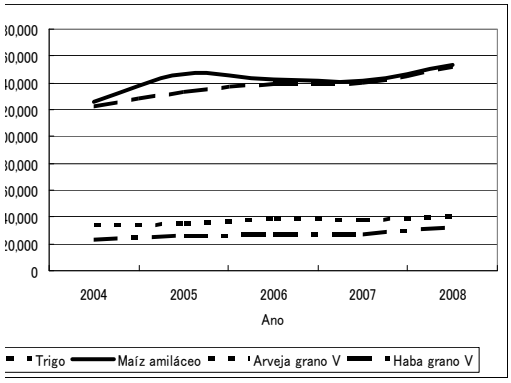
Non peeled rice	2004	2005	2006	2007	2008
Amil. Maize	890,313	1,119,279	1,121,019	1,234,828	1,391,911
Potato	125,475	146,571	142,402	141,907	153,888
Wheat	1,709,641	1,855,084	1,807,661	1,816,911	2,012,799
Yellow maize	121,624	132,833	138,920	139,399	151,493
Broad bean	382,104	409,038	458,862	511,518	552,909
Sweet pea grain	22,983	25,728	27,040	27,000	32,377
Cassava	33,862	34,762	38,493	36,917	40,391
Non peeled rice	273,288	313,651	392,136	385,753	389,061

Source: Monthly Agrarian Statistics, MINAG

Trend of Crops Production (2004-2008)



Trend of Crops Production (2004-2008)



(2) Determination of agricultural productivity

Basic Condition:

The base to determine the productivity for the 9 departments is constituted by:

- Information of Monthly Agrarian Statistics, MINAG 2008 (January 2008-May 2009)

- Productivity for each crop has been classified in the three following levels:

Level 1: (Without Project) Low productivity. Defined as manual production area. Rain fed land characterized by crops under rain fed and partial irrigation with shortage of water (Level 2 x 70%).

Level 2: (With project) Medium Productivity. Defined as average irrigation areas– land with irrigation (maximum average productivity of the Monthly Agrarian Statistics has been considered, 2008, MINAG).

Level 3: (Technical Irrigation) High Productivity. Defined as irrigation areas with optimum management.

The following Table shows the levels of production in year 2008, by departments and main crops, allowing the configuration of the real base to determine the productivity in areas close to the intervention zones of the Program:

Table 3.6-3
Production Costs of Crops by Departments (kg/ha)

Crops	Level	Department								
		AMAZ	CAJAM	PIURA	LIBERT	ANCAS	HUANUC	JUNIN	HUANCA	AYACUC
Alfalfa	1	-	34,280	9,610	38,640	21,520	20,800	28,190	28,050	27,850
	2	-	48,965	13,723	55,197	30,749	29,709	40,266	40,067	39,791
	3	-	73,448	20,585	82,796	46,124	44,564	60,399	60,101	59,687
Potato	1	10,830	9,330	10,020	12,620	8,080	13,000	13,460	7,730	13,010
	2	15,466	13,323	14,310	18,031	11,545	18,571	19,223	11,040	18,588
	3	23,199	19,985	21,465	27,047	17,318	27,857	28,835	16,560	27,882
Barley grain	1	780	670	610	1,170	710	1,060	1,380	1,130	1,050
	2	1,110	959	872	1,678	1,010	1,509	1,967	1,611	1,500
	3	1,665	1,439	1,308	2,517	1,515	2,264	2,951	2,417	2,250
Amillaceous Maize	1	650	1,050	700	1,550	990	1,070	1,350	1,180	880
	2	927	1,500	1,000	2,211	1,407	1,533	1,930	1,682	1,250
	3	1,391	2,250	1,500	3,317	2,111	2,300	2,895	2,523	1,875
Green Sweet pea	1	2,160	1,720	550	3,060	2,570	4,220	4,900	2,770	2,870
	2	3,089	2,454	786	4,370	3,667	6,029	7,004	3,953	4,100
	3	4,634	3,681	1,179	6,555	5,501	9,044	10,506	5,930	6,150
Wheat	1	750	860	780	1,370	720	980	1,480	1,050	1,010
	2	1,068	1,231	1,111	1,962	1,030	1,396	2,114	1,502	1,436
	3	1,602	1,847	1,667	2,943	1,545	2,094	3,171	2,253	2,154
Green Broad bean Grain	1	2,450	2,290	570	4,020	2,610	5,830	4,790	3,070	2,010
	2	3,500	3,269	810	5,742	3,733	8,333	6,847	4,392	2,875
	3	5,250	4,904	1,215	8,613	5,600	12,500	10,271	6,588	4,313
Dry Sweet pea Grin	1	630	1,070	1,130	990	880	1,260	1,220	1,000	860
	2	900	1,528	1,611	1,413	1,250	1,800	1,738	1,434	1,222
	3	1,350	2,292	2,417	2,120	1,875	2,700	2,607	2,151	1,833
Choclo Maize	1	5,690	6,510	5,040	7,130	7,390	6,040	8,660	9,100	5,440
	2	8,124	9,294	7,200	10,188	10,555	8,636	12,369	13,000	7,765
	3	12,186	13,941	10,800	15,282	15,833	12,954	18,554	19,500	11,648
Rice	1	5,120	5,580	6,970	7,330	5,530	4,370	4,320	-	1,460
	2	7,318	7,965	9,960	10,475	7,895	6,249	6,171	-	2,088
	3	10,977	11,948	14,940	15,713	11,843	9,374	9,257	-	3,132
Hard Yellow maize	1	1,600	4,840	3,490	6,010	3,630	3,840	2,370	1,650	2,100
	2	2,292	6,912	4,982	8,583	5,192	5,482	3,390	2,354	3,000
	3	3,438	10,368	7,473	12,875	7,788	8,223	5,085	3,531	4,500
Cassava	1	10,770	5,960	7,450	10,690	15,050	7,920	8,260	-	7,390
	2	15,050	8,512	10,636	15,267	21,500	11,313	11,803	-	10,556
	3	22,575	12,768	15,954	22,901	32,250	16,970	17,705	-	15,834
Dry Broad bean Grain	1	1,050	1,000	700	1,020	850	1,080	1,350	1,150	840
	2	1,500	1,428	1,000	1,459	1,213	1,540	1,927	1,636	1,200
	3	2,250	2,142	1,500	2,189	1,820	2,310	2,891	2,454	1,800
Olluco	1	5,440	4,060	2,750	6,050	3,690	12,440	4,520	3,960	3,760
	2	7,767	5,801	3,925	8,643	5,273	17,771	6,456	5,656	5,375
	3	11,651	8,702	5,888	12,965	7,910	26,657	9,684	8,484	8,063
Sweet potato	1	9,100	5,880	17,620	10,110	12,760	9,740	-	-	8,520
	2	13,000	8,400	25,169	14,442	18,222	13,917	-	-	12,167
	3	19,500	12,600	37,754	21,663	27,333	20,876	-	-	18,251
Dry bean	1	840	960	700	1,130	1,050	1,290	1,060	1,050	1,460
	2	1,207	1,374	1,000	1,615	1,500	1,848	1,508	1,500	2,083
	3	1,811	2,061	1,500	2,423	2,250	2,772	2,262	2,250	3,125
Coffee	1	590	760	340	700	-	430	800	400	570
	2	837	1,088	488	1,000	-	612	1,139	570	817
	3	1,256	1,632	732	1,500	0	918	1,709	855	1,226

Source: MINAG Data- 2008

Table 3.6-4
Production Variety– Without Project

Crop	AREA (HA)	Mean Yields (KG/HA) NACIONAL	Mean Price S/. x KG	Mean Production Cost	Mean Production Cost at Social Price	Mean Cost (S/.)	Production Cost at Social Prices
GARLIC	4.80	4,000.00	1.91	2,805.00	1,963.50	13,464.00	9,424.80
ARTICHOKE	3,328.39	11,650.00	2.52	5,480.75	4,136.87	16,980,662.77	13,577,812.03
MEDIC	324.77	25,481.84	0.23	1,980.25	1,378.89	556,793.50	415,440.18
MEDIC (MANTENIM.)	2.00	9,900.00	0.18	1,765.83	1,097.33	3,531.67	2,194.67
RICE	6,220.00	7,769.23	0.69	4,041.26	2,863.74	25,584,558.83	18,129,877.09
PEA GRAIN DRY	1,526.03	1,849.94	1.46	1,493.25	1,064.24	3,816,816.16	2,921,380.59
PEA GRAIN GREEN	185.80	2,792.50	0.94	1,588.78	1,225.23	203,710.51	162,124.05
TRENCHES FORRAGE	170.00	10,905.00	0.22	1,874.96	1,445.53	258,525.46	199,595.37
TRENCHES GRAIN	158.67	2,045.00	0.65	2,009.22	1,583.86	142,201.94	103,179.05
COFFEE	150.00	450.00	6.34	2,380.00	1,808.80	357,000.00	271,320.00
SWEET POTETOS	130.00	11,750.00	0.42	1,111.80	803.54	144,534.00	104,460.01
SUGAR CANE	610.00	23,687.50	0.48	5,420.49	4,205.14	1,649,284.00	1,246,104.30
BAELEY	967.34	1,384.64	0.80	980.25	717.56	1,016,924.82	770,078.99
FORRAGE BAELEY	185.00	10,000.00	0.13	722.50	578.00	133,662.50	106,930.00
FLOWER	43.00	1,500.00	1.50	2,125.00	1,700.00	91,375.00	73,100.00
BEAN	369.48	1,185.00	2.15	1,867.88	1,241.91	461,871.17	317,488.54
FRUIT	10.00	6,500.00	1.13	2,911.45	2,260.95	16,800.00	12,075.70
DRY FAVA BEAN	917.79	2,456.54	1.17	1,369.88	1,003.34	1,341,384.48	973,149.88
GREEN FAVA BEAN	259.90	3,620.14	0.63	1,340.03	1,013.38	315,318.84	250,018.49
GRASSES AROMATIC							
VEGETABLES	579.00	7,668.89	0.87	2,229.14	1,494.49	1,018,413.87	619,166.62
KIWICHA	15.00	3,800.00	1.50	2,089.30	1,483.25	31,339.50	22,248.75
LEMON SUBTLE	90.00	22,000.00	0.25	3,714.80	2,518.37	334,332.00	226,653.30
CORN	3,058.76	2,447.50	1.21	1,690.37	1,144.21	5,829,178.91	4,124,646.71
CORN CHOCLO	770.70	8,995.50	0.61	1,465.21	961.18	646,828.06	452,542.20
MANGO	150.00	20,000.00	0.35	5,920.93	4,203.07	888,139.50	630,460.50
APPLE	150.00	5,000.00	1.50	6,930.00	3,716.86	1,039,500.00	557,529.00
MASHUA	7.40	5,833.33	0.43	2,082.50	1,457.75	14,042.00	9,829.40
PEACHTREE	16.60	752,545.00	0.47	4,986.95	3,751.82	70,682.94	54,697.06
ORANGE TREE	10.00	2,350.00	0.60	1,275.00	1,155.15	12,750.00	11,551.50
GOOSE	34.40	4,675.00	0.61	1,962.28	1,337.58	61,828.22	39,678.00
OLLUCO	184.47	4,987.60	0.69	2,178.06	1,560.84	421,066.47	324,450.12
AVOCADO	340.00	9,300.00	1.70	4,563.68	2,930.28	2,075,605.00	1,108,192.97
POTATO	3,765.16	9,338.53	0.58	3,672.56	2,729.11	14,893,773.82	11,096,803.84
PAPRIKA	70.00	3,000.00	2.00	2,198.95	1,833.45	153,926.50	128,341.50
GRASSES	4,122.39	42,207.94	0.09	1,277.80	706.94	7,209,037.87	4,455,843.91
BANANA	30.00	8,500.00	0.39	2,975.00	2,584.00	89,250.00	77,520.00
QUINUA	207.80	1,066.67	1.47	1,159.28	811.49	173,083.32	121,158.33
CABBAGE	30.00	12,000.00	0.90	3,034.50	2,129.25	91,035.00	63,877.50
SOYA							
HANGUP	200.00	5,000.00	2.53	3,977.50	1,281.48	1,166,000.00	138,932.00
TARWI	54.00	841.50	2.53	1,432.68	984.94	83,014.40	61,544.25
WHEAT	921.05	1,183.14	1.07	948.98	676.09	765,717.70	531,968.34
GRAPE	900.00	14,400.00	2.00	12,297.12	9,714.72	11,067,408.00	8,743,252.32
YUCCA	120.00	15,000.00	0.48	1,526.94	1,107.13	183,232.80	132,855.84
CARROT	2.00	6,375.00	0.37	1,581.00	1,106.70	3,162.00	2,213.40

Table 3.6-5 Production Variety– With Project

Crop	AREA (HA)	Mean Price S/. x KG	Mean Production Cost at Social Price	Mean Cost (S/.)	Production Cost at Social Prices
GARLIC			1.91	3,300.00	2,310.00
ARTICHOKE	3,462.95	13,604.40	2.52	6,447.94	4,866.91
MEDIC	1,572.80	32,721.10	0.23	2,329.70	1,622.23
MEDIC (MANTENIM.)	365.00	24,000.00	0.18	2,077.45	1,290.98
RICE	13,880.00	9,083.33	0.69	4,396.35	3,115.37
PEA GRAIN DRY	3,691.01	2,713.94	1.46	1,749.09	1,262.63
PEA GRAIN GREEN	758.80	4,135.67	0.94	1,869.15	1,441.45
TRENCHES FORRAGE	227.00	18,250.00	0.22	2,205.84	1,700.62
TRENCHES GRAIN	170.00	4,263.33	0.65	2,363.79	1,863.36
COFFEE	250.00	600.00	6.34	2,800.00	2,128.00
SWEET POTETOS	170.00	11,750.00	0.42	1,308.00	945.34
SUGAR CANE	1,133.00	32,365.00	0.48	6,271.52	4,874.73
BAELEY	1,867.99	2,221.38	0.80	1,208.30	897.83
FORRAGE BAELEY	275.00	12,460.00	0.13	850.00	680.00
FLOWER	43.00	2,000.00	1.50	2,500.00	2,000.00
BEAN	2,480.00	1,558.88	2.15	2,067.54	1,402.31
FRUIT	135.00	16,700.00	1.13	3,332.00	2,789.60
DRY FAVA BEAN	1,705.83	3,320.59	1.17	1,616.25	1,198.81
GREEN FAVA BEAN	1,166.01	4,635.34	0.63	1,576.51	1,192.21
GRASSES AROMATIC	125.00	5,000.00	3.95	4,294.08	2,552.10
VEGETABLES	1,320.00	9,524.89	0.87	2,691.73	1,877.06
KIWICHA	15.00	4,180.00	1.50	2,458.00	1,745.00
LEMON SUBTLE	150.00	24,560.00	0.25	3,714.80	2,518.37
CORN	7,835.74	3,201.41	1.21	2,035.09	1,395.06
CORN CHOCLO	1,445.52	10,129.00	0.61	1,723.78	1,130.80
MANGO	200.00	23,160.00	0.35	5,920.93	4,203.07
APPLE	300.00	8,000.00	1.50	7,500.00	6,930.00
MASHUA	31.00	8,350.00	0.43	2,450.00	1,715.00
PEACHTREE	32.60	833,000.00	0.47	5,867.00	4,413.90
ORANGE TREE	20.00	2,800.00	0.60	1,500.00	1,359.00
GOOSE	52.00	5,826.67	0.61	2,276.50	1,694.30
OLLUCO	237.11	6,401.00	0.69	2,532.07	1,882.53
AVOCADO	750.00	9,700.00	1.70	5,094.33	4,423.85
POTATO	8,264.35	12,582.48	0.58	4,374.94	3,272.83
PAPRIKA					
GRASSES	7,495.00	25,483.75	0.09	1,509.87	912.65
BANANA	50.00	9,800.00	0.39	3,500.00	3,040.00
QUINUA	308.80	1,610.00	1.47	1,363.86	954.70
CABBAGE	30.00	13,200.00	0.90	3,570.00	2,505.00
SOYA	889.34	2,500.00	1.58	1,853.08	1,501.09
HANGUP	585.00	4,350.00	2.53	4,247.50	4,014.00
TARWI	1,445.00	1,980.00	2.53	1,685.50	1,158.75
WHEAT	2,022.53	1,823.28	1.07	1,116.38	805.33
GRAPE	1,000.00	15,480.00	2.00	14,467.20	11,429.09
YUCCA	120.00	15,000.00	0.48	1,796.40	1,302.51
CARROT	72.00	8,500.00	0.37	1,860.00	1,302.00

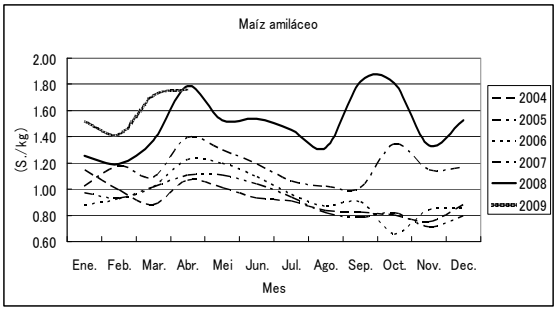
(3) Determination of Prices:

1) Basic Condition

The information proceeds from the Monthly Agrarian Statistics of, MINAG, Average Price Paid to Producer (in the field) 2008 (January to December).

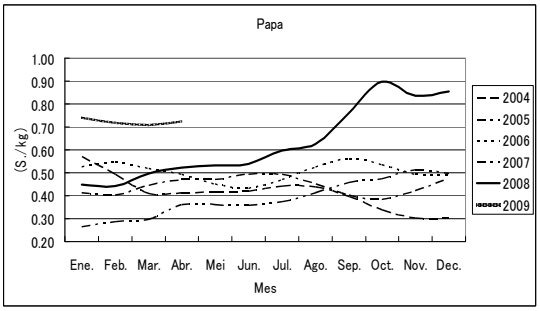
2) Price Analysis

Agricultural prices corresponding to 2008 are significantly higher than those in previous periods, trend that is repeated for all other products. As seen in the following graphics, in the case of amillaceous maize, potato and cassava; all prices in general maintain trend to rise since 2008. The average prices of the twelve months of year 2008 has been considered as base for the calculation of the gross value of production in the Program, according to the guidelines for the determination of prices contained in the Methodological Guide for the Identification, Formulation and Evaluation of Large and Medium Irrigation Projects, of the Ministry of Economy and Finance, 2003 and the projections of the Multi-Annual Macro-economic Framework 2010-2012, prepared by the Ministry of Economy and Finance, MEF in May 2009.



Prices of Amillaceous Maize ;2004-2009

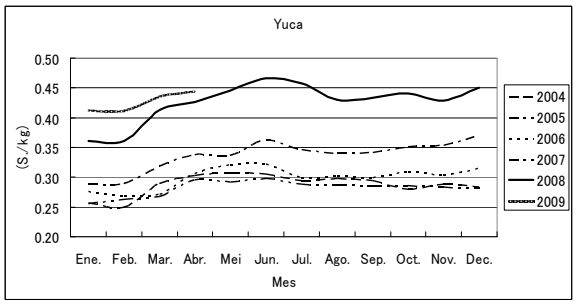
Source: Study Team based in Monthly Agrarian Statistics, MINAG 2008



Prices of Potato 2004-2009

Source: Study Team based in Monthly Agrarian Statistics, MINAG 2008

Price of Cassava



(4) Determination of Cultivation Area

Basic Condition:

- Average of MINAG's statistics data are used for the periods corresponding to 2002-2007.
- Crops selected as reported by the Zonal Directions – AGRO RURAL.
- Non peeled rice is considered as product for the department of Amazonas only.
- For projects that do not need Pre-feasibility Study, cultivation areas are to be estimated for each product by department.
- Level 1: Land without irrigation system; Level 2: Land with irrigation system

- From the total of new irrigation areas it is estimated that presently (without project) 50% is cultivated in Level 1 and the other 50% is not cultivated. In areas of improvement it is estimated that presently (without project) 50% is cultivated in Level 1 and the other 50% is cultivated in Level 2, so productions is estimated under said parameters.
- It is estimated that production (with Project) increases up to 150% (except for permanent crops).

(5) Determination of Unit Costs of Production

Production costs of crops and the information in detail is included in the Annex.

Basic Condition:

- Data presented by AGRORURAL in the Perfil are to be updated to determine the production costs of each product. The same procedure was taken to all departments.
- As there are many cases of low productivity in each department, the production cost will be regulated according to the average productivity. An average of productivity per crop will be calculated as reference. Those products showing productivity higher than the average will not be readjusted and those below the average will be readjusted according to the proportion of the difference with the average.(See annex: Costs of production)

Table 3.6-6 Direct Benefit of the Program

Component	Direct Benefit
Component A:	
Individual Projects:	
Type 1	Increase by Irrigation Improvement; 0 has Increase by Irrigation Incorporation; 2,810 has
Type 2-A	Increase by Irrigation Improvement; 0 has Increase by Irrigation Incorporation; 1,066 has
Type 2-B	Increase by Irrigation Improvement; 1,155 has Increase Irrigation Incorporation; 605 has
Type 3-A	Increase by Irrigation Improvement; 3,434 has Increase Irrigation Incorporation; 4,821 has
Type 3-B	Increase by Irrigation Improvement; 2,179 has Increase Irrigation Incorporation; 3,693 has
Conglomerate Irrigation Infrastructure:	
Type 4-A	Increase by Irrigation Improvement; 8,699 has Increase Irrigation Incorporation; 5,002 has
Type 4-B	Increase by Irrigation Improvement; 300 has Increase Irrigation Incorporation; 1,679 has
Type 5	Increase by Irrigation Improvement; 2,356has Increase Irrigation Incorporation; 953 has
Total	Total: Irrigation Improvement 18,103 has Total: Irrigation Incorporation 20,629 has
Component B: "Institutional Strengthening for the Water Resources Management in Microwatersheds"	Institutionalization of Water Resources Management in Microwatersheds and conservation program– Organization of producers: 50 Committees of Water Resources Management and 56 Associations of Producers

Source: Study Team Own Source

a) Agricultural Plans.

The Program, in the situation "Without Project", will be benefited by the launching of optimization actions of the existing situation, through activities of technical assistance oriented to improve some determined cultural farming tasks to – in a certain grade - improve income and /or lower production costs.

Estimation of Benefits.

a) Benefits in Situation "Without Project"

Benefits "Without Project", are calculated based on the gross value of agricultural production of crops and the production cost. The difference in theses values represents the net value of production (production costs, prices in the field and earning of crops are annexed in the corresponding annex)

Table 3.6-7 Net value of agricultural production without Project at private prices

CONCEPT	YEAR									
	1	2	3	4	5	6	7	8	9	10
GROSS VALUE OF PRODUCTION	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977
TOTAL COST PRODUCTION	99,243,168	99,243,168	99,243,168	99,243,168	99,243,168	99,243,168	99,243,168	99,243,168	99,243,168	99,243,168
NET VALUE OF PRODUCTION	153,090,808	153,090,808	153,090,808	153,090,808	153,090,808	153,090,808	153,090,808	153,090,808	153,090,808	153,090,808

Net value of production at private prices is S/. 153'090,808.00

Table 3.6-8 Net value of agricultural production without Project at social prices

CONCEPT	YEAR									
	1	2	3	4	5	6	7	8	9	10
GROSS VALUE OF PRODUCTION	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977	252,333,977
TOTAL COST PRODUCTION	71,266,970	71,266,970	71,266,970	71,266,970	71,266,970	71,266,970	71,266,970	71,266,970	71,266,970	71,266,970
NET VALUE OF PRODUCTION	181,067,006	181,067,006	181,067,006	181,067,006	181,067,006	181,067,006	181,067,006	181,067,006	181,067,006	181,067,006

Net value of production at social prices is S/. 181067,006 and social prices are higher than private because they are not affected to taxes.

b) Benefits in Optimized Situation

In the following Table the benefits with criteria of the situation optimized, both at private and social prices are presented.

Table 3.6-9 Net value of agriculture production optimized at private prices

CONCEPT	YEAR									
	1	2	3	4	5	6	7	8	9	10
GROSS VALUE OF PRODUCTION	252,333,977	252,333,977	252,333,977	252,333,977	302,800,772	302,800,772	302,800,772	302,800,772	302,800,772	302,800,772
TOTAL COST PRODUCTION	99,243,168	99,243,168	99,243,168	99,243,168	104,205,327	104,205,327	104,205,327	104,205,327	104,205,327	104,205,327
NET VALUE OF PRODUCTION	153,090,808	153,090,808	153,090,808	153,090,808	198,595,445	198,595,445	198,595,445	198,595,445	198,595,445	198,595,445

Net value of production optimized at Private Prices is S/. 153’090,808.00 during the years without project but simulating an optimization in earnings in 20% and production costs conservatively in 5% we can obtain a net value of production of S/. 198`595,445 from the fifth year.

Table 3.6-10 Net value of agriculture production optimized at social prices

CONCEPT	YEAR									
	1	2	3	4	5	6	7	8	9	10
GROSS VALUE OF PRODUCTION	252,333,977	252,333,977	252,333,977	252,333,977	302,800,772	302,800,772	302,800,772	302,800,772	302,800,772	302,800,772
TOTAL COST PRODUCTION	71,266,970	71,266,970	71,266,970	71,266,970	74,830,319	74,830,319	74,830,319	74,830,319	74,830,319	74,830,319
NET VALUE OF PRODUCTION	181,067,006	181,067,006	181,067,006	181,067,006	227,970,453	227,970,453	227,970,453	227,970,453	227,970,453	227,970,453

Net value of production optimized at Social Prices is S/. 181’067,006 during the years without project but simulating an optimization in earnings in 20% and production costs conservatively in 5% we can obtain a net value of production of S/. 227`970,453 from the fifth year

c) Benefits in Situation “With Project”

Likewise, the benefits in the situation with project have been determined.

Table 3.6-11 Net value of the agricultural production with Project at private prices

CONCEPT	YEAR									
	1	2	3	4	5	6	7	8	9	10
GROSS VALUE OF PRODUCTION	252,333,977	252,333,977	252,333,977	252,333,977	500,480,634	500,480,634	500,480,634	500,480,634	500,480,634	500,480,634
TOTAL COST PRODUCTION	99,243,168	99,243,168	99,243,168	99,243,168	220,560,193	220,560,193	220,560,193	220,560,193	220,560,193	220,560,193
NET VALUE OF PRODUCTION	153,090,808	153,090,808	153,090,808	153,090,808	279,920,441	279,920,441	279,920,441	279,920,441	279,920,441	279,920,441

Net value of Production with project at private prices is S/. 153’090,808.00 during the years without project but with project, earnings and production costs have increased as appreciated in Tables of the corresponding annex, obtaining a net value of production of S/. 279`520,441, from the fifth year, first year already with project.

Table 3.6-12 Net value of the agricultural production with Project at social prices

CONCEPT	YEAR									
	1	2	3	4	5	6	7	8	9	10 al 13
GROSS VALUE OF PRODUCTION	252,333,977	252,333,977	252,333,977	252,333,977	500,480,634	500,480,634	500,480,634	500,480,634	500,480,634	500,480,634
TOTAL COST PRODUCTION	71,266,970	71,266,970	71,266,970	71,266,970	160,868,473	160,868,473	160,868,473	160,868,473	160,868,473	160,868,473
NET VALUE OF PRODUCTION	181,067,006	181,067,006	181,067,006	181,067,006	339,612,161	339,612,161	339,612,161	339,612,161	339,612,161	339,612,161

Net value of Production with project at social prices is S/. 181'067,006 during the years without project but with project, earnings and production costs have increased as appreciated in Tables of the corresponding annex, obtaining a net value of production of S/. 339`612,161, from the fifth year, first year already with project.

So, we can indicate that the increase in the net value of production is tripled, implying a higher benefit for farmers, fulfilling the objective of the program, of improving the level of life and retrieving them from poverty.

d) Incremental Benefits

The incremental net value results from the comparison of gross values of production in the situation with project and without project, intervening the optimized situation with the incremental cost of production. The difference between incremental gross value and the incremental cost is the net incremental value

The net value of incremental production at private prices is S/. 81'324,996, this amount is generated from the fifth year, when production starts after the project and it is going to be maintained during the following years, as can be seen in the following Table

Table 3.6-13 Incremental Net Value at Private Price

DISCRIPTION	YEAR									
	1	2	3	4	5	6	7	8	9	10
A. INCREMENTAL GROSS PRODUCTION VALUE										
1.With Project	252,333,977	252,333,977	252,333,977	252,333,977	500,480,634	500,480,634	500,480,634	500,480,634	500,480,634	500,480,634
2.Without Project	252,333,977	252,333,977	252,333,977	252,333,977						
3.Optimized Situation					302,800,772	302,800,772	302,800,772	302,800,772	302,800,772	302,800,772
TOTAL	0	0	0	0	197,679,862	197,679,862	197,679,862	197,679,862	197,679,862	197,679,862
B. INCREMENTAL TOTAL COSTO					0					
1.With Project	99,243,168	99,243,168	99,243,168	99,243,168	220,560,193	220,560,193	220,560,193	220,560,193	220,560,193	220,560,193
2.Without Project	99,243,168	99,243,168	99,243,168	99,243,168						
3.Optimized Situation					104,205,327	104,205,327	104,205,327	104,205,327	104,205,327	104,205,327
TOTAL	0	0	0	0	116,354,866	116,354,866	116,354,866	116,354,866	116,354,866	116,354,866
C. INCREMENTAL NET PRODUCTION VALUE	0	0	0	0	81,324,996	81,324,996	81,324,996	81,324,996	81,324,996	81,324,996

At social prices the net value of incremental production is S/. 111'641,708 per year, this amount is generated from the fifth year when production starts after the project and it is maintained during the next years, as seen in the following Table

Table 3.6-14 Incremental Net Value at Social Price

DISCRIPTION	AÑO									
	1	2	3	4	5	6	7	8	9	10
A. INCREMENTAL GROSS PRODUCTION VALUE										
1.With Project	252,333,977	252,333,977	252,333,977	252,333,977	500,480,634	500,480,634	500,480,634	500,480,634	500,480,634	500,480,634
2.Without Project	252,333,977	252,333,977	252,333,977	252,333,977						
3.Optimized Situation					302,800,772	302,800,772	302,800,772	302,800,772	302,800,772	302,800,772
TOTAL	0	0	0	0	197,679,862	197,679,862	197,679,862	197,679,862	197,679,862	197,679,862
B. INCREMENTAL TOTAL COSTO										
1.With Project	71,266,970	71,266,970	71,266,970	71,266,970	160,868,473	160,868,473	160,868,473	160,868,473	160,868,473	160,868,473
2.Without Project	71,266,970	71,266,970	71,266,970	71,266,970						
3.Optimized Situation					74,830,319	74,830,319	74,830,319	74,830,319	74,830,319	74,830,319
TOTAL	0	0	0	0	86,038,155	86,038,155	86,038,155	86,038,155	86,038,155	86,038,155
C. INCREMENTAL NET PRODUCTION VALUE	0	0	0	0	111,641,708	111,641,708	111,641,708	111,641,708	111,641,708	111,641,708

Therefore, we can say that the net incremental value occurs after the termination of works and trainings of the program execution

3.7 Social Evaluation

Program evaluation has as objective to verify that the selected technical solutions optimize the economic results. That means achieve efficiency of the resources to be applied in the projects of small and medium irrigation infrastructure, issue of the program. At this level it is important to consider the results of the social evaluation, as expression of the social benefits or increase in the welfare of the attended population with the implementation of the projects, and to the society as a whole, in the measure that the program has been designed to act in zones of high concentration of poverty and extreme poverty. From that, we may define this program as a productive social program.

3.7.1 Methodology of Evaluation

The Program bases its process of formulation, evaluation, approval, feasibility, construction and ex post evaluation, in the "project cycle", in the framework of Law Nº 27293 created by the National System of Public Investment, its regulation, complementary norms and methodological tools; particularly the Methodological Guide for the Identification, Formulation and Evaluation of Large and Medium Irrigation Projects 2003, formulated by the General Direction of Multi-annual Programming of the Ministry of Economy and Finance, DGPM; whose guidelines consider the followings assumptions:

(1) Horizon of Evaluation

The period for the program evaluation is 10 years, including 5 years of execution of the program components and 5 years of evaluation itself. Other variables have a horizon foreseen according to the following schedule of execution:

Table 3.7-1 Chronological Horizon of the Project

Description	Period
Disbursement Period	5 years
Evaluation Horizon	10 years
Program Execution	5 years

SCHEDULE OF THE PROGRAM EXECUTION

As indicated, the program will be executed in five years, and as in component infrastructures of irrigation with Dam are to be constructed, they will require more time than those that consider canal improvement only, but time required for administrative issues for personnel contracting has been estimated. The Steering Council and the program coordinators will start their actions in one year, to finish in year 05 with the final evaluation and impact of the program.

Table 3.7-2 Program Execution Schedule

	ITEM	YEAR 1				YEAR 2				YEAR 3				YEAR 4				YEAR 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	COMPONENT A																				
1	A. DETAILED DESIGN																				
2	B IRRIGATION INFRASTRUCTURE																				
	IRRIGATION WORKS																				
	TRAINING																				
	PROMOTION OF ASSOCIATIVITY FOR PRODUCTIVITY																				
	TECHNICAL ASSISTANCE																				
	LATERAL CANALS																				
3	C. GENERAL EXPENSES																				
4	D.- SUPERVISION EXPENSES																				
	COMPONENT B																				
1	A. DETAILED DESIGN																				
2	B. CHARACTERIZATION OF WATER RESOURCES IN MICROWATERSHEDS																				
3	C. COMMITTEE OF WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS AND PRODUCERS																				
	PROGRAM MANAGEMENT																				
1	ADMINISTRATION –MONITORING AND SUPERVISION AND STUDIES FOR OF THE PROGRAM																				
2	INTERNATIONAL TECHNICAL SUPERVISION																				
	TOTAL																				

SCHEDULE OF THE PROGRAM'S DISBURSEMENTS

The disbursement schedule is directly related to the program execution which administratively is programmed not to jeopardize the timely disbursements to contractors and consultants and do not stop the execution of the program; for this purpose, the following Table shows the disbursement schedule of each component and annual activities; further details of these Tables are in the corresponding annexes by trimester.

Table 3.7-3 Disbursement Schedule of the Program

		YERA				
	SUBJECT	YERA 1	YEAR 2	YEAR 3	YERA 4	YEAR 5
1	A. DETAILED DESIGN	2,177,963.00				
	B IRRIGATION INFRA.					
2	IRRIGATION WORKS		40,071,481.59	40,071,481.59	33,392,901.33	20,035,740.80
3	CAPACITY BUILDING		63,845.00	767,568.11	1,279,280.19	511,712.08
4	STRENGTHENING OF ASSOCIATION FOR UPGRADING OF PRODUCTIVITY	0.00	0.00	1,095,711.28	2,228,360.00	0.00
5	TECHNICAL ASSISTANT	0.00	0.00	1,829,868.57	5,489,605.71	1,829,868.57
6	LATERAL CANALS	0.00	0.00	946,688.74	1,893,377.47	315,562.91
7	C. GENRAL EXPENDITURE	0.00	2,015,977.07	2,015,977.07	1,679,980.89	1,007,988.53
8	D.-SUPERVISION EXPENDITURE	0.00	4,129,128.48	4,129,128.48	3,440,940.40	2,064,564.24
	COMPONENT B					
1	A. DETAILED DESIGN	469,000.00	0.00	0.00	0.00	0.00
2	B.IDENTIFICATION OF WATER RESOURCES AT MICRO-WATERSHED	0.00	6,603,567.57	0.00	0.00	0.00
3	C. WATER RESOURCES MANAGEMENT COMMITTEE AND FARMERS COMMITTEE AT MICRO-WATERSHED	0.00	6,096,590.54	1,356,078.38	2,115,445.95	1,353,567.57
	PROGRAM MANGEMENT					
1	ADMINISTRATION, MONITORING, SUVERVISION AND STUDY OF PROGRAM CONTROL	4,006,326.72	5,341,768.96	6,677,211.20	5,875,945.86	4,807,592.06
2	INTERNATIONAL TECHNICAL SUPERVISION	1,899,554.35	2,532,739.13	3,165,923.91	2,786,013.04	2,279,465.22
	CONTINGENCIES	1,366,666.68	1,366,666.68	1,366,666.68	1,366,666.68	1,366,666.68
	TOTAL	9,919,510.74	68,221,765.01	63,422,304.00	61,548,517.51	35,572,728.65

(2) Conversion of Investment Costs at Social Prices

The National System of Public Investment has Evaluation Parameters contained in Annex SNIP 09, applicable to the evaluation of projects with the purpose of correcting distortions in the economy (IGV, subsidies and tariffs). Once analyzed to establish its applicability to the Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra, it is determined that:

Factors referred to traded goods, or goods of the external sector (Importable/Exportable), which CIF/FOB price is affected by a Social Price of the Currency of 1.08; are not applicable to the Program, for the goods incorporated to the cost structure of the Program projects are not originated in the external sector.

Factors referred to non traded goods, or goods of the internal market, which price is determined by the demand and supply in the country are applicable to the Program, for almost in their totality; goods comprised in the costs structure of the program are traded in the national market. Consequently, tariffs, subsidies and IGV will be discounted from the private prices.

Factors of social value of time constitute the time savings generated in the projects of automation or transportation. Its application does not correspond to the program, since the projects comprised in it do not belong to the category of road or systematization projects.

Social Price of Fuel: Yes, it corresponds to apply in the program, for said consumables are embedded in the project construction activities. It is converted to social price by applying a correction factor of 0.66

Social Price of Labor, Skilled and unskilled: Yes, it corresponds to apply in the program,

for it is comprised in all activities of construction. It is converted to social prices, applying the correction factors of 0.91 for skilled labor and 0.41 for unskilled labor (this last, because the Program intervention areas is located in the rural area).

Correction factors are applicable to each one of the cost components of investment in infrastructure, under the following SNIP structure:

Table 3.7-4 Correction Factors

Description	F. C.*
1. MACHINERY AND EQUIPMENT	
Traded	0.830
Non traded	0.840
2. MATERIAL AND INPUT	
Traded	0.823
Oil**	0.660
Non traded	0.840
3. LABOR	
Skilled labor	0.909
Unskilled labor **	0.410
4. GENERAL EXPENSES	
Traded	0.823
Non traded	0.840

* Calculated according to Guide for Identification, Formulation and Social Evaluation of PIP at Perfil Level. MEF. DGPM. July 2003.
** Source: Annex SNIP 09. DG SNIP

The breakdown costs at social prices applying the factors can be seen in the annex of costs.

For the Program, conversion factors in the total structure costs are grouped by large items, according to the following Table of conversion factors:

Table 3.7-5
Structure of Investment Cost Conversion at Social Prices

Item	Description	Factor
A.	Detailed Design	0.91
B.	Infrastructure	0.84
C.	Training	0.91
D.	Technical Assistance	0.91
E.	Environmental Mitigation	0.91

Source: Study Team based in the typical cost budget structure.

Justification:

It represents a conservative scenario for the program as long as certain cost components that are grouped will be determined when the perfil of each component presents them in detail, case that will be considered in the investment stage of the program; so, the IRR of the selected alternative will always be lower than the one obtained by the SNIP breakdown. See annex Costs of component A.

The alternative scheme will be used only by purposes of application to the program, for later, as we manifested in each pre-investment study, counting on with the corresponding data base, it will be formulated under the cost structure required by the SNIP in the evaluation stage of each project.

(3) Conversion of Production Costs at Social Prices

The conversion of production costs at social prices is in general, affected to the same correction factors used to the conversion of investment costs at social prices contained in the Annex SNIP-09. However, considering that the agricultural production comprised in the geographic area of the program has characteristics corresponding to a type of closed economy, with low technological level and little volume of production, that in a set conform a regime of production of peasant economy, it has been assumed to maintain the same production costs in the evaluation, both at social and private prices.

(4) Social Discount Rate

The Social Discount Rate (TSD) represents the cost of opportunity committed by the society when the public sector extracts resources from the economy to finance its projects and it is used to transform into present value the future flows of benefits and costs of a project in particular. The use of a single discount rate allows to compare the present net value of public investment projects, and; for the case of the present program, the Discount Rate to be used is 11%, as indicated in the Annex SNIP 09, since the prices used for the cost calculation of the projects considered in it are expressed at real or constant prices of March 2009.

3.7.2 Social Evaluation applying the Cost/Benefit methodology

According to the characteristics of the program the goodness of the same should be measured in one part through the methodology Cost-Benefit, as indicators of the Social Net Present Value (SNPV) and the Social Internal Rate of Return SIRR at a money cost of 11%.

The pertinent flow of benefits has been obtained directly from the demand function that in good measure represents the cash income of changes in social welfare over the economy as a whole, obtaining the following results:

Table 3.7-6 Economic Social Indicators

NPV (11%)	IRR	R (B/C)
221,755,855	35.21%	2.36

Under these criteria and with the positive results of the SNPV the program is feasible from a social perspective. The cash flow from where the social indicators of evaluation have been identified is observed in the following Table:

Table 3.7-7 Cash Flow of the Program at Social Prices

Year										
0	1	2	3	4	5	6	7	8	9	10
-629,426	-629,426	-629,426	-629,426	842,103	842,103	842,103	842,103	842,103	842,103	842,103
0	0	0	0	842,103	842,103	842,103	842,103	842,103	842,103	842,103
629,426	629,426	629,426	629,426	0	0	0	0	0	0	0
0	0	0	0	81,324,996	81,324,996	81,324,996	81,324,996	81,324,996	81,324,996	81,324,996
-629,426	-629,426	-629,426	-629,426	82,167,099	82,167,099	82,167,099	82,167,099	82,167,099	82,167,099	82,167,099
9,919,511	68,221,765	63,422,304	61,548,518	35,785,806	216,758	213,078	213,078	216,758	213,078	213,078
9,919,511	**68,221,765**	**63,422,304**	**61,548,518**	**35,572,729**						
0	0	0	0	213,078	216,758	213,078	213,078	216,758	213,078	213,078
629,426	629,426	629,426	629,426	842,503	846,183	842,503	842,503	846,183	842,503	842,503
629,426	629,426	629,426	629,426	629,426	629,426	629,426	629,426	629,426	629,426	629,426
-10,548,936	-68,851,191	-64,051,730	-62,177,943	46,381,293	81,950,341	81,954,021	81,954,021	81,950,341	81,954,021	81,954,021
88,910,526										
20.89										
1.46										

3.8 Private Evaluation

The Private Evaluation (at market prices) is carried out in order to measure the potential participation of the private sector in financing the program execution and operation.

The characteristics of the evaluation at private prices, under the methodology of cost benefit, are the obtaining of Private Net Present Value (PNPV) and the Private Intern Return Rate (PIRR) highly positive, making the program profitable, as can be observed in the following Table:

Table 3.8-1 Economic Private Indicators

NPV (11%)	IRR	R /(B/C)
88’910,526	20.89%	1.46

The resulting indicators have been obtained from the fund flow, as shown in the following Table.

Table 3.8-2 Fund Flow of the Program at Private Process

Year										
0	1	2	3	4	5	6	7	8	9	10
-542,449	-542,449	-542,449	-542,449	731,221	731,221	731,221	731,221	731,221	731,221	731,221
0	0	0	0	731,221	731,221	731,221	731,221	731,221	731,221	731,221
542,449	542,449	542,449	542,449	0	0	0	0	0	0	0
0	0	0	0	111,641,708	111,641,708	111,641,708	111,641,708	111,641,708	111,641,708	111,641,708
-542,449	-542,449	-542,449	-542,449	112,372,928	112,372,928	112,372,928	112,372,928	112,372,928	112,372,928	112,372,928
10,580,886	57,672,267	51,094,926	53,839,158	29,842,997	188,772	188,772	188,772	188,772	188,772	188,772
10,580,886	**57,672,267**	**51,094,926**	**53,839,158**	**29,654,225**						
0	0	0	0	188,772	188,772	188,772	188,772	188,772	188,772	188,772
542,449	542,449	542,449	542,449	731,221	731,221	731,221	731,221	731,221	731,221	731,221
542,449	542,449	542,449	542,449	542,449	542,449	542,449	542,449	542,449	542,449	542,449
-11,123,335	-58,214,716	-51,637,375	-54,381,607	82,529,931	112,184,157	112,184,157	112,184,157	112,184,157	112,184,157	112,184,157
221,755,855										
35.21										
2.36										

3.9 Sensibility Analysis

It has as purpose to determine how the Net Present Value at social prices (SNPV) could be affected by variations in the most important items of income and costs, which will establish the limit values that said variables could reach, maintaining the project profitable. The Methodological Guide for the Identification, Formulation and Evaluation of Large and Medium Irrigation Projects, DGPM-MEF 2003 suggest the conduction of mono-varied sensibility analysis that is the most usual method (affecting only variable each time), respect to the changes in the reduction of agriculture products prices.

In the case of this program, the field work conducted, as well as the utilized statistic records (average of five years for crops productivity), the relative stability of intern prices of agriculture input and the fact of using a conservative scenario both for estimated production volume as well as for the prices of agriculture products, allow to establish the consistency of variables; however, for methodological purposes, as sensible variables to the program it is proposed: infrastructure cost (cost of the project investment).

Table 3.9-1 Analysis of Sensibility at Private Prices

INCREASE OF INVESTMEN				**DECREASE OF AGRICULTURE INCOME**			
%	**IRR**	**NPV**	**B/C**	**%**	**IRR**	**NPV**	**B/C**
0.00	**20.89**	**88,910,526.00**	**1.46**	0.00	**20.89**	**88,910,526.00**	**1.46**
30.00	14.13	33,204,890.00	1.13	5.00	15.30	45,462,215	1.24
48.00	10.98	-218,491.00	1.00	10.30	10.95	-592,995	1.00

Table 3.9-2 Analysis of Sensibility at Social Prices

INCREASE OF INVESTMEN				DECREASE OF AGRICULTURE INCOME			
%	**IRR**	**NPV**	**B/C**	**%**	**IRR**	**NPV**	**B/C**
0.0	**35.21**	**221,755,855**	**2.36**	0.000	**35.21**	**221,755,855**	**2.36**
30.0	27.29	174,565,291	1.83	5.000	27.23	178,307,544	2.09
48.0	23.60	146,250,953	1.61	10.300	21.39	132,252,334	1.81
100.0	15.59	64,453,975	1.20	25.600	10.96	-699,499	1.00
141.0	11.00	-39,796	1.00				

Concerning the variable production, the Table of results shows that the program maintains its feasibility by a reduction of production prices in 25.60% at social prices, and an increase of 141% in the cost of life at social prices, situation that still is sustainable, that is; it is sensible relatively to the fall of agricultural prices.

Finally, it should be stressed that the social and economic feasibility of the Program of Small and Medium Irrigation in the Peruvian Sierra is linked to the Plan of Economic Stimulation (PEE), implemented by the Government in an amount representing 3.2% of GNP, to attend mainly the most affected sectors by the international crisis. The main goal of the PEE is directed to increase public investment and social expenses, in order to reduce the gap in infrastructure, increase productivity and promote long term growth. To the date, more than 222 million Nuevos Soles have been transferred to some 1,952 districts for the development of irrigation infrastructure maintenance activities (canals, catchments, intake, level gauges, micro reservoirs, drainage, etc.). In this way, it is part of a national strategy and policy oriented to strengthening the agricultural productive sector and to the improvement in the quality of life of important sectors of the population, located in segments of poverty and extreme poverty.

3.10 Risk Analysis

The Program has the following objectives

Central Objective:

Increase Agricultural Production of Rural Families in Zones of Poverty"; and as specific objectives the following:

Specific Objectives:

1. Increase the Water Conveyance Infrastructure to provide to crops oriented to generate agrarian and rural economic income.

2. Efficient use of water resources in crops oriented to generate agrarian and rural economic income.

3. Improve the level of water resources management at microwatersheds for the recovery, conservation and distribution as part of the hydrographic units of High-Andean Ecosystems.

4. Improvement in the level of organization and management of rural families to generate innovations and a better destination for their production in poverty zones lacking water.

In these Components the Main Fundamental Means have been identified:

- Bring the far away water sources closer to provide water to the cultivation areas.
- Sufficient maintenance and operation of the existing irrigation Infrastructure and new irrigation infrastructures.
- Increase the capacity of intangible capital of farmers and rural families.
- Local actors trained and with knowledge about the great susceptibility of degradation of natural resources, to conduct activities to allow the availability and sustainability of natural resources.
- Trained local actors and rural families participate in actions of care and availability of water resources with proper practices.

For the execution of said means a series of activities have been foreseen that will allow the achievement of the goals and objectives of the Program; whose successful results should take into account factors of risk of probable damage and/or losses that could jeopardize the goals to achieve: improvement of irrigation for 18,073 hectares of cultivation and incorporate 20,659 hectares of cultivation, favoring in average the increase in the production of crops approximately 44%.

Risk analysis will be conducted for the following aspects:

1) Identification of Risks
2) Level of Risks Vulnerability
3) Analysis of Risks
4) Matrix of Risks Mitigation

1) Identification of Risks

The risks that can affect the achievement of benefits have been identified in the following Table:

POSIBLE RISKS TO OBTAIN THE EXPECTED RESULTS

ITEM	RISKS
Program	▪ Little or no disposition of financial participation by Regional Governments ▪ Little or no disposition of financial participation by Local Governments ▪ Little dynamical internal markets ▪ Expensive or inexistent agricultural credit to finance small farmers harvests ▪ Low prices of products discouraging agricultural production ▪ Emigration of trained producers to more developed areas
Component Infrastructure Irrigation	▪ Unpredictable or casual damage by natural disasters as result of climate change effects. ▪ New water demanders.
Component Institutional Strengthening for Water Resources Management at Microwatershed Level	▪ Little disposition of rural families to finance part of the technical irrigation ▪ Resistance to pay for the real cost of irrigation water ▪ Excess of hours in economic activities that could affect the assistance of rural families in training and implementation activities

2) Levels of Risks Vulnerabilities

The vulnerability levels for each risk have been classified according to their influence in the successful implementation of the Program, and an evaluation table has been prepared

to identify risks as high, medium or low:

LEVEL OF VULNERABILITY FOR EACH RISK

Risk Factor	Level of Vulnerability		
	Low	Medium	High
Little or no disposition of financial participation by Regional Governments	X		
Little or no disposition of financial participation by Local Governments.	X		
Little dynamical internal markets		X	
Expensive or inexistent agricultural credit to finance small farmers harvests			X
Low prices of products discouraging agricultural production	X		
Emigration of trained producers to more developed areas		X	
Unpredictable or casual damage by natural disasters as result of climate change effects.			X
New water demanders	X		
Resistance to pay for the real cost of irrigation water			X
Excess of hours in economic activities that could affect the assistance of rural families in training and implementation activities		X	

3) Risk Analysis

The identified factors of risk will be confirmed or solved during the period of the detail design elaboration. In this item, the possible identified risks will be analyzed and classified with distinct levels of vulnerability.

3).1 Little or no disposition of financial participation by Regional Governments

This factor of risk could affect water availability at level of lot if the expected contribution from the Regional Governments have priority in other sectors, like the case of Ancash that count on with eight hundred million and want to use them in two roads only; this contribution would correspond among other aspects to finance lateral canals that would make water conveyance to lots more efficient. Although this possibility of risk could be overcome through the exposition of objectives and benefits of the Program, for once farmers count on with irrigation water (main canal) and see that they can be more efficient and have more water available, they will find ways to self-finance and also request the support of the respective Regional Government, some of whom are aware of the existence of the investment Program under negotiation, and even are offering to cooperate in the execution.

3).2 Little or no disposition of financial participation by Local Governments

This factor of risk could affect the support required by rural families to improve their economic conditions and the contribution of said governments is also in function to their priorities and it would correspond, among other aspects to finance lateral canals to make water conveyance to the lots more efficient. Although this possibility of risk could be overcome through the exposition of objectives and benefits of the Program, for once farmers count on with irrigation water (main canal) and see that they can be more efficient and have more water available, they will see the means to self-finance and also request the support of the respective Local Government. Also, some municipalities are aware of the existence of the investment Program under negotiation, and are offering to cooperate in the execution under their jurisdiction.

3).3 Little dynamical internal markets

This factor has a medium level of vulnerability for the internal market of the country is little developed and a possible increase in production volumes could saturate local markets, that is supply of products could be higher than the demand and they would have to be exported to other regions. However, this risk could be eliminated through the association of producers to conform organized demanders and suppliers, forming value chains and a proper advisement in commercial negotiations, to sell production surplus to other national or international markets. Also agreements could be made with mining center so they supply agricultural products directly from the field to the mine and with the local social Programs.

3).4 Expensive or inexistent agricultural credit to finance small farmers harvests

The formal bank system has not coverage for peasants or small farmers at the high-Andean rural zones who due to a series of technicalities and economic solvency, are not considered subjects of credit. Under this reality, informal credit is the shelter for said producers who are obliged to pay for usurers' interests. In this context, to seek for formal financing to cover production costs of crops is inexistent for this segment of rural producers. However, this situation can be reversed with the participation of the same farmers, who by association could conform cooperatives of credit and services, also it is possible to make strategic alliances with private non profit organizations (municipalities, NGOs, etc.), to have access to supervised credit programs, capitalization funds, rotating funds, among others.

3).5 Low prices of products discouraging agricultural production

The commercialization system in the country is expensive for the rural producer for products are bought at low prices from farmers who are the first link in the chain and input needed for production are sold at high prices, as the last link in the chain. In a certain way, this commercial inequality contributes to the descapitalization of agriculture favoring the city, leading to the perennial vicious circle of rural poverty. In this way, low prices constitute a risk because discourages exclusive dedication and entrepreneurial management that producers should assume in their agricultural labor and on the contrary, their productive agricultural activities are shared with periods of emigration to the cities or valleys at the costa, as wage earners. The mitigation for this situation is to support the increase of production and to make farmers choose more profitable crops, also promote associations to conform cooperatives for joint sales and purchases of goods and services,

not individually as they presently do.

3).6 Emigration of trained producers to more developed areas

The formation of technical farmer producers by actions of training and technological transfer could be a risk by the emigration to other places with higher level of agriculture development, due to low productivities and even more in zones without water. In order to prevent this drain of rural talents, firstly they have to be supported, providing them with water, that is the limiting factor to all activity and has no substitute, in order to increase productivity, specially the crops they work with, and also strengthen and formalize their organizations with the commitment to associate and participate in action they will generate both to innovate and to sell; it will contribute to the sustainability of the Program.

3).7 Unpredictable or casual damage by natural disasters as result of climate change effects.

Climate change is a fact and given the incipient researches conducted in the country, it is still hard to predict the occurrence of a phenomenon, its duration and the cost of it, as we are living these days and one example of the power of nature is Cusco and Puno, among others. However, with the sector policies of adaptation to climate change and other actions derived from investigation both from specialized institutions of the private and public sectors as well as universities, the ones that best adapt to the conditions and characteristics of projects conforming the present Program will be implemented. Presently AgroRural has a dynamic Program of reforestation with a goal of 100 million plants as part of the adaptation to climate change. In respect to the concrete action in the place of the irrigation infrastructure works, the same peasants organizations, as part of their labor of operation and maintenance in coordination with the local committees of civil defense and the technical advisement of AgroRural, will conduct protection works of the irrigation infrastructure, planting trees along the canals, to protect and avoid landslides avalanches and collapses.

3).8 New water demanders

This factor of risk, in one part is in function to the number of actors and the entities in the microwatershed area and the development plans that demand water resources, and the other part the present quantity of water available for agricultural activity; this aspect is regulated by the National Authority of Water and an agreement of mutual cooperation is under negotiation with this entity, in order to prevent social conflicts.

3).9 Resistance to pay for the real cost of irrigation water

It is constantly repeated that there is not a culture to pay for water; this sentence apply to the whole population, urban and rural, to the great companies as mini landholders in the city and in the countryside. In Peru, water is wasted and it produces rice in the costa (that is a desert); water is not considered as an input, payments made do not justify the real cost of the resources, besides they cause erosion and salinity of farming and no farming land. As ANA establishes a real price, according to the territorial characteristics of each region, producers using irrigation water foreseen in the present Program will be organized in

Irrigation Committees and will establish the quota system according to theirs ways that should cover the actions of operation and maintenance of irrigation infrastructure that will allow the sustainability and obtaining the expected benefits.

3).10 Excess of hours in economic activities that could affect the assistance of rural families in training and implementation activities

In general, rural families are dedicated to multiple economic activities to cover their necessities, which many times are not satisfied, making them dedicate much more hours of physical labor in low productivity activities. The risk will be reduced if their main activity, cultivation, improves their income with the same effort; that is achieved firstly through the access to controlled water and in this base they can organize themselves to look for innovations and improve the destination of their production.

4) Matrix of Risk Mitigation

RISKS	MITIGATION MEASURES
Little or no disposition of financial participation by Regional Governments	Exposition of the objectives and goals to be achieved with the implementation of the Program and to execute irrigation works at the programmed dates, for once farmers have irrigation water (main canal) and see they can be more efficient and so have more availability of water, they will find the means to finance themselves and also request support to the respective regional Government.
Little or no disposition of financial participation by Local Governments	Exposition of the objectives and goals to be achieved with the implementation of the Program and to execute irrigation works at the programmed dates, for once farmers have irrigation water (main canal) and see they can be more efficient and so have more availability of water, they will find the means to finance themselves and also request support to the respective local Government.
Little dynamical internal markets	Promote association of producers to the conformation of organized actions of demand and supply and to form value chains, facilitating the support to be provided and a proper advisement in commercial negotiations, to take advantage of the opportunities of the market and production surplus to be sold to regional, national or international markets.
Expensive or inexistent agricultural credit to finance small farmers harvests	Participation of the same farmers who in an associative way could conform cooperatives of credit and services, also it is feasible to conform strategic alliances with non profit private association to accede to Programs of supervised credit, capitalization funds, revolving funds, among other new financial services..
Low prices of products discouraging agricultural production	Association to promote cooperatives for joint sales and purchases of goods and services, not individually as they presently do
Emigration of trained producers to more developed areas	Form capacities, transfer knowledge and firstly support them by providing water that is the limiting factor to all activity and has no substitute, in order to increase productivity, and also strengthen and formalize their organizations with the commitment to associate and participate in actions they will generate both to innovate and to sell; it will contribute to the sustainability of the Program
Unpredictable or casual damage by natural disasters as result of climate change effects	The goal is to reforest 100 million plants as part of the adaptation to climate change and in the areas of the irrigation infrastructure works, the same peasants organizations, as part of their labor of operation and maintenance and in coordination with the local committees of civil defense and the technical advisement of AgroRural, to conduct protection works of the irrigation infrastructure, planting trees along the canals, to protect and avoid landslides avalanches and collapse through works of prevention and dampening.
New water demanders	An agreement of mutual cooperation with the National Authority of Water is under negotiation, in order to prevent social conflicts.

Resistance to pay for the real cost of irrigation water	Farmers will be organized in Irrigation Committees and will establish, according to theirs ways, the quota system, that should cover the actions of operation and maintenance of irrigation infrastructure that will allow the sustainability and obtaining the expected benefits
Excess of hours in economic activities that could affect the assistance of rural families in training and implementation activities foreseen in the Program	Considering the idiosyncrasy, costumes, values and educational level of beneficiaries and knowing that rural families are dedicated to multiple economic activities to cover their needs, that many times are unsatisfactory, the risk will be reduced if the main activity, cultivation, improve earnings with the same effort; it is achieved firstly by acceding to controlled water and based in it they can organize and look for innovations and improve the destination of their production.

3.11 Analysis of sustainability

The Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra is priority of the initiatives of public policies of the State, concerning National Strategies of Rural Development and Food Security, part of the National Plan to Overcome Poverty.

The sustainability analysis identifies the feasibility of institutional arrangements referring to the conditions that will allow a joint work between the Executing Unit, the cooperation entities and the direct beneficiaries of the program.

In this sense, it should be mentioned that the main and direct participants of the Program are conformed by the following institutions: Cooperation Entity JICA, the Program of Productive Agrarian Development -AGRORURAL, National Authority of Water -ANA, Regional Governments, Local Governments, Water Users Organizations and farmers.

In this line of analysis, AGRORURAL proposes that benefits are maintained in the long term, for that, the proposal is supported in: technical validity, economic and financial feasibility, participation of beneficiaries, the contribution of the Program in strengthening the organizations, empowerment of beneficiaries organizations promoted by the Program, the support and commitment of the National Government assumed to achieve Rural Development and consequently the reduction of the existing poverty level in our country.

In this context, the Executing Unit of the Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra is AGRORURAL, entity that results from the fusion of eight entities among investment programs and projects, acquiring the professional experiences and capacities of its staff.

A.- Institutional arrangements for the pre-operation, operation and maintenance.

Said activities are to be fully assumed by the water users organizations constituted during the construction process of the irrigation infrastructure. It is foreseen that said irrigation committees are to be formally acknowledged. It means that responsibilities of operation and maintenance of irrigation works are to be perfumed according to the technical requirements of the system and according to the organization and their y customs the way to participate in quotas corresponding to them.

In relation to the equipment to be installed in the microwatersheds to record basic data of meteorology and water resources, it will be assumed by the executing unit during the implementation process and in this process, local actors are to be trained, both for information collection as for the posterior decentralization, the executing entity is to be responsible of the operation and maintenance together with the committee of the water resources management of the microwatershed.

B.- Regulation framework to allow the execution and operation of the Program

Public investment is regulated from the stages of pre-investment investment and post-investment both by norms of the National System of Public Investment as by norms of Budget, Control, and Auditing and according to the loan contract, also in relation to the environmental laws that have been published.

C.- Management capacity of the organization in charge of the Program in the investment and operation stage.

AGRORURAL is oriented to improve living and working conditions of families at the rural area, focusing its activities in the reduction of poverty, in coordination with the sub-national governments, from the generation of agribusiness and projects of rural development to facilitate the integration of farmers to the markets, as the main tool to increase their income, consequently, their level of life.

This executing unit has the adequate technical and operative capacity through the Zonal Directions and Agencies, distributed in the entire area of the Program intervention.

- Participation of the population not defined as direct beneficiary of the Program, in the irradiation of the economic effects of the interventions such as: increase agriculture activity as consequence of more intensive use of soils (double harvest) and the incorporation of new cultivation areas will demand more labor force, improvement or generation of new road infrastructure and other basic services such as health, education, sanitation; organization implementation and commercial practices that will bring the population closer to the market and will act as demonstrative effect of improvement of life quality to the surroundings.

D.- Financing of operation and maintenance costs and contributions.

Users of water resources count on with the necessary capacities to assume the operation and maintenance of the irrigation system, referred to the quota to pay for the water; such populations lack this institutionalization and are guided more by their costume of uses and traditions, deeply rooted in their culture.

Operation and maintenance of equipment in the microwatersheds are to be assumed by AgroRural in the first years and later, with the participation of the committee of water resources management at microwatersheds to conform a very useful database, the annual adjustment of equipment is to be assumed by the executing entity of the project.

As evidence of the willingness to pay for the use of irrigation water, the results of the Socioeconomic Survey to Beneficiary Farmers developed in the Program intervention area are illustrative; in this respect the following can be concluded:

- 98.5 per cent of producers are disposed to participate in the construction of irrigation infrastructure; 95.5% by contributing with labor force, 59.1 per cent of producers are disposed to pay a tariff for the operation and maintenance of the irrigation infrastructure and those not disposed to pay, would do it with labor force (59.3%), communal job (14.8%). Also, 59.1 per cent can participate in the system of water tariff collection and 97 per cent declared that if the government contributes with 80 per cent they would contribute with the remaining 20 per cent, to improve their system of technical irrigation. 82 per cent declared that would be willing to pay this contribution with work.

E.- Participation of beneficiaries.

The participation of beneficiaries is fundamental to assure the benefits of the project, and in the visited sites, the willingness and interest of beneficiaries to participate in the

Program were evident.

This participation will be improved in organization previous a series of regulations and agreements, explicit or implicit, to assure the correct administration of water and irrigation infrastructure. The sustainability of the irrigation system reinforces the organization structure of the irrigation committees, providing solidity in the operation of the minor irrigation infrastructure, and a proper organization level to the maintenance of large irrigation infrastructure; assuring the sustainability of the system as a whole. Also, the Program will promote the development of local capacities and the exercise through workshops with the local actors in the microwatersheds, sub-national governments, and peasants' grass roots organizations. In consequence, the possibilities that actions and successful results of the Project are maintained in time are quite high, for obviously the first problem of priority is water for irrigation, so it always will be a motive of gathering and dynamic participation.

F.- Adopted measures to reduce the vulnerability of the project due to natural or socio-natural hazards or social conflicts.

Climate change and global warming is a worldwide fact and given the incipient level of research within the country, it is still very difficult to foresee a phenomenon, its duration and the cost of it, as we are living these days and one example of how nature can go wild is Cusco, Piura, Ucayali and Puno, among others. However, with the sector policies of adaptation to climate change and other actions derived from investigation both from specialized institutions of the private and public sectors as well as universities, the ones that best adapt to the conditions and characteristics of projects conforming the present Program will be implemented. Besides, the inter-institutional articulation is foreseen, which will allow the union of synergic efforts and in a coordinated manner to confront the natural and socio-natural dangers.

Presently AgroRural has a dynamic Program of reforestation with a goal of 100 million plants as part of the adaptation to climate change. In respect to the concrete action in the sites of the irrigation infrastructure works, the same peasants organizations, as part of their labor of operation and maintenance and in coordination with the local committees of civil defense and the technical advisement of AgroRural, will conduct protection works of the irrigation infrastructure, planting trees along the canals, to protect and avoid landslides avalanches and collapses. Grassroots organizations, strengthened and managed by the same peasants leaders, properly trained are a guarantee to minimize risks of social conflicts, as shown through the peasants patrols, the self-defense in the period of Sendero Luminoso subversion.

3.12 Environmental Impact

According to Article 8º of Law Nº 27446, Law of the National System of Environmental Impact Evaluation and Article 36º of its Regulation and due to the reason that possible slight environmental impacts were identified in the approved Pre-Feasibility study of the Program of Small and Medium Irrigation Infrastructure in the Peruvian Sierra, a Proposal to classify the program in Category I has been prepared.

The Study of Preliminary Evaluation has been prepared, constituted by the Environmental Impact Declaration (DIA) the same to be submitted to the competent authority of the Sector for approval, and the same to become the Environmental Certification.

3.13 Organization and Management

The Executing Unit responsible for the Program "Small and Medium Irrigation Infrastructure in the Peruvian Sierra is AGRORURURAL, entity created through Legislative Decree Nº 997, with the purpose of promoting agrarian development, through financing of public investment projects in rural areas less economic developed in the agrarian scope, according to the norms in force.

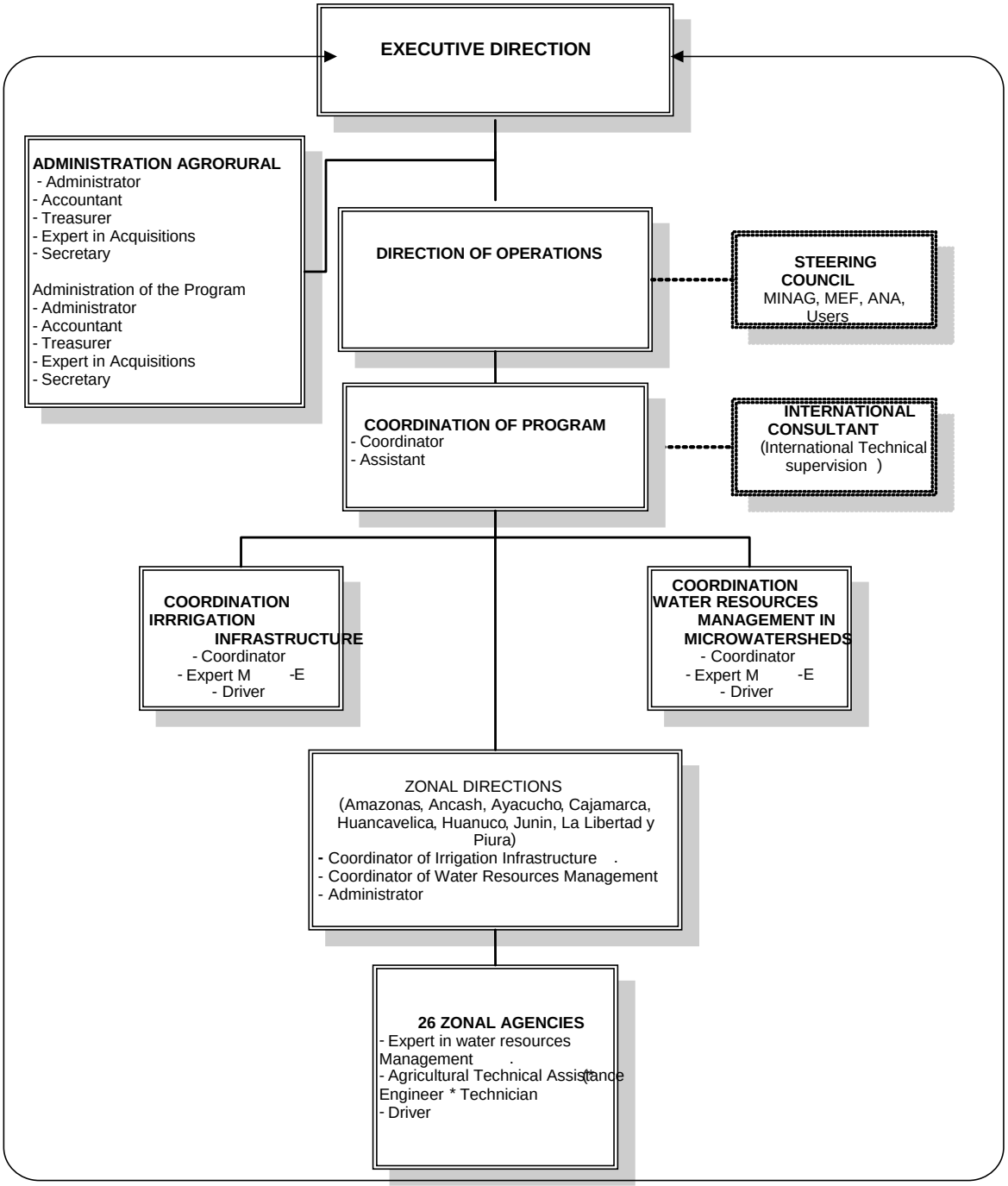
Given the characteristics of the Program and agreements among the concerned parts in the design and management, it has been considered to structure an organization named Unit of Program Coordination for the implementation, management, administration, monitoring and evaluation of the Program.

In this sense, it has been foreseen that the Program, in charge of AGRORURAL, should have a special structure, the same that is described as follows:

a) Program Coordinator (plus assistant)
b) One coordinator of Irrigation Infrastructure (plus expert in monitoring and evaluation)
c) One coordinator of Management of Water Resources in Microwatersheds (plus expert in monitoring and evaluation)
d) One responsible for Administration and finance (administrator)
e) One registered public accountant
f) One treasurer
g) One expert in acquisitions
h) One secretary
i) One driver
j) One coordinator of Irrigation Infrastructure and one coordinator of Management of Water Resources in Microwatersheds in each Zonal Direction considered in the Program, additionally one administrator and one driver.

Above this structure, there is a surveillance entity of the Program, named Steering Council.

ORGANIZATIONAL TABLE
"SMALL AND MEDIUM IRRIGATION INFRASTRUCTURE IN THE PERUVIAN SIERRA"



STEERING COUNCIL:

It is entity of the Program surveillance and execution.

Members of the Steering Council are:

- One representative of the Ministry of Agriculture
- One representative of the Ministry of Economy and Finances
- One representative of the National Authority of Water
- One representative of the beneficiaries
- Executive Director of AGRORURAL or his representative

Functions:

- Watch over the implementation of the Program and its working
- Guarantee the fulfillment of the programmed goals, taking notice of the physical and financial progress reports
- To meet once a year.

FUNCTIONS OF THE INTERNATIONAL CONSULTANTS

- Support the Unit of Program Coordination (UCP) in the preparation of the Program Implementation Plan
- Support UCP in the global management (including the preparation of the Progress Report, Project Finalization Report), financial management (in terms of disbursement) and institutional coordination
- Verify and approve the detailed design of the irrigation installations
- Review the study of public investment project and approve the detailed designs before the works execution and verification in site
- Advise and supervise the activities of environmental surveillance
- Supervise and control the progress, quality, cost and safety of the civil works construction.
- Control and approve the program of contractors and construction drawings, review the original design, technical specifications, construction drawings and workshop drawings and calculations related to the estimations at the construction stage, supervision.
- Control and approve construction materials, including quarry material through quality control tests
- Propose the corrective measures of technical and/or administrative nature to be applied, in order to overcome detected risks.
- Conduct the supervision of works execution and evaluate in site to determine the work progress to issue the pertinent recommendations, in order to improve the development of works and the management.
- Monthly inform the physical and financial situation and progress of the works, according to the formats of the international technical supervision
- Technical supervision of the works in execution, visiting the site at least once a week, and the compatibility and concordance with the executed expenses with the physical execution of works, according to formats of the international technical supervision.
- Solve doubts and consultations during the works construction, formulated by the

resident engineer, through the work log, as part of the international technical supervision.

- Verify, in a selective way, that the bill of quantities executed of the valuation is really executed.
- It has the faculty of stopping the works execution if some vice that is against the quality and economy is found, formulating the corrective measures of technical and/or administrative nature, considered the most convenient to be applied.
- Issue opinion about cases of works modification, as part of the international technical supervision
- Evaluate, approve or observe the liquidations submitted by the contractor executing the works
- Determine the value of the executed works, to verify and certify the claims of the contractor for the progress payment and to solve claims of the contractor, if there were some.
- Keep proper record necessary for the final report preparation.
- Carry out final inspection of all executed works by contractors and the issue of works termination certificates.
- Assist and supervise the capacity of construction of activities (including formation and training of irrigation users committee for operation and maintenance, promotion of irrigation techniques, organization of the producers organizations, agricultural extension and marketing studies), as well as the elaboration of manuals for each activity and provide training to local consultants, experts, extension promoters, etc.)
- Support the committees of water resources management and supervise the activities of watershed management.
- Submit an Inception Report at the end of the second month after the commencement of works, containing the general work program, arrangements for the administrative work plan, results of the review of the existing information during the commencement period
- Submit monthly reports of work progress, problems found and solutions, deviations from the original work plan, and foreseen works according to the work schedule.
- Submit quarterly reports and a summary of the consultant's activities about the progress, problems found and solutions, deviations from the original work plan, and foreseen works according to the work schedule for the next period.
- Submit reports at the end of the annual assignment each year, summarizing the consultant's activities, the progress of work during the report period, problems found and solutions, deviations from the original work plan, and foreseen works according to the work schedule for the next year
- Prepare a final report at the end of all services, with all aspects related to the project management and works, indicating among other aspects, the modifications in case there were some, and the unit costs.

FUNCTIONS OF THE PROGRAM PERSONNEL

National Coordinator of the Program

It is the operative sphere of the Program. It is responsible for the technical and financial

administration of the Project.

Functions and responsibilities of the Program Coordinator

- Manage, coordinate and direct the program implementation in an articulated way, in order to achieve the objectives and goals of development programmed
- Coordinate with the Consultant responsible for the international technical supervision the aspects in relation to the program execution, fulfillment of quality and programmed times.
- Execute policies, guidelines and strategies for the Program implementation and the achievement of results.
- Prepare the operative plan for the five years and of each year with the support of the International Technical Supervision.
- Prepare the annual budgets of the program in articulation with the international consultant.
- Responsible for the regular reports of monitoring and evaluation of the Program's progress.
- Monthly inform the planning office of AGRORURAL, about the physical and financial progress of the programmed activities.
- Take the required measures to make the negotiations for contracts and acquisitions for the works execution and activities of the program implementation in time, in coordination with the international consultant.
- Inform and submit to the Steering Council the pertinent documents for approval.
- Responsible for the good use of the Program's resources.
- Propose the financing priorities of the Program.

Support personnel of the executive coordination

It is conformed by the Administrator, Registered Public Accountant, Treasurer, and Expert in Acquisitions, Secretary and Driver, whose functions are described as follows:

Administrator

The administration and finances office will have as supporting staff one accountant, one treasurer, one expert in acquisitions and as logistic support to the program, one secretary.

Also, administrative staff in the nine zonal directions of the program is considered, and they will coordinate with headquarters.

The administrator will have the following functions:

- Administration and financial management of the Program, according to the procedures of the public sector, and JICA's when it corresponds.
- Coordinate and provide administrative and financial information to the responsible entity of the Program - AGRORURAL
- Prepare and coordinate with AGRORURAL the requests and records required by MINAG, MEF and JICA in respect to the request of fund retrieves and accounts of the loan disbursements.

- Formulate the Annual Operative Budget, coordinating with the instances of the Project.
- Prepare financial projections, as well as evaluate the Program execution.
- Dispose the adequate destination and application of funds, according to the budget.
- Coordinate with the National Coordinator of the Program, the priority criteria for the Program's resources distribution.
- Formulate, propose and execute the Annual Plan of Acquisitions of goods and services.
- Direct, control, evaluate and supervise the processes of input, equipment, and spare parts, material and services acquisition to allow the normal functioning of the Program.
- Administrate the physical, financial and human resources required by the Program and propose guidelines necessary to optimize the good use of said resources.
- Direct, control and evaluate the process of records and control of the staff as well as the selection and contract of human resources.
- Coordinate the administrative actions of Zonal Directions and the zonal agencies of AGRO RURAL.
- Keep the National Coordinator of the Program and coordinators permanently informed about the main indicators of administrative management of the Program.
- Organize, direct, coordinate and evaluate the processes and development of the Program's Administrative and –Financial progress.
- Preparation of monthly financial statements, as well as timely reports of budgetary advancements and submit the respective reports to the coordination entities.

Accountant

a. Keep the accounts of the program, keeping accounting books and personnel pay roll, assigning expenses according to the program's accounts, implementing the respective account plan and accounting the budgetary execution, in the framework of the accountancy rules adapted for the project working.

b. Regularly report about the progress of financial execution.

c. Carry out expenses conciliation with bank statements, accountability and the state of Agro Rural headquarters in Lima, to the Ministry of Economy and Finances and JICA.

d. Prepare financial, accounting and budgetary reports, and subscribe the same with the responsible officers of the program.

e. Prepare accountability, both quarterly and yearly and submit them to the administration, which in turn, submits them to the program coordination for the revision and later submittal to AGRORURAL.

f. Consolidation of accountability and timely justification of expenses to JICA, according to the dispositions of the loan agreement and annex documents.

g. Prepare monthly statements of verification and conduct a monthly analysis of accounts.

h. Prepare monthly and yearly financial statements, according to the forms of the

private sector

i. Prepare financial reports required by JICA.

j. Apply the tax norms in force, instructing and advising the different instances of the program, mainly the coordinators of irrigation infrastructure and of water resources management in microwatersheds, about changes or updates in tax issue applicable to the Program

k. Review the monthly accountability submitted by the zonal directions and agencies and give consistency in the implemented accountancy system

l. Review accountability of the responsible officers and account them in the program records

m. Sign payment documents and carry out a previous control of the documentation justifying the payment

n. Carry out bank conciliations of the Program's accounts and supervise at random bank accounts of the regions concerned with the project.

o. Coordinate issues of its competency with the entities of tax administration, general comptroller, external auditors and other similar entities.

p. Propose norms to improve expenses control

q. Propose to the program coordinator, projects or rules and procedures to allow improvements in the processes that conforms the program accountancy system.

r. Control and organize accountancy files.

s. Provide timely information to the administration and zonal directions and agencies about the conduction of monthly budgetary control in order to fulfill with the budget.

t. Other assigned by the coordinator and/or administrator of the program.

Treasurer

a. The treasurer is responsible for managing the financial resources of the program in order to assure the necessary means for the normal work

b. Watch over for the fulfillment of directives and procedures of treasure, according to the norms of the Peruvian system and the cooperation entity.

c. Carry out activities of income reception, expenditures and payment of obligations

d. Other assigned by the coordinator and/or administrator of the program.

Expert in Acquisitions

a. Coordinate, execute and control the processes of acquisitions and contracts required by the Program

b. Organize and develop activities of formulation and procedures of payment orders and sales of goods, services and works of the program to be authorized by the Program coordinator and/or coordinators of the components to acquire the goods and services in the market

c. Other assigned by the national coordinator and/or administrator of the program.

Secretary

a. Type reports requested by the program coordinator

b. Keep the Program coordinator permanently informed about the activities to be conducted

c. Take dictations, redact and type documents or reports, according to the specific instructions of the program coordinator.

d. Prepare Aide memoirs by request of the program coordination

e. Process and reproduce documents of the Program coordination and carry out a follow up according to the norms and procedures in force

f. Operate the computer systems applied in the Program, according to the area of function competence

g. Carry out coordination and negotiations related to work meetings or other events, preparing the information and/or documents necessary for the program coordinator.

h. Answer consults about issues and negotiations of the Coordinator's competence informing and orienting persons requiring information, in the limits authorized and in accordance to the received instructions.

i. Receive, classify, register, distribute and carry out the follow up of all documents received directed to the Coordinator to make it possible the timely attention of the issues originating them.

j. Answer and/or make calls related to the functions of the job, maintaining the information smoothly, according to the requirements of the program

k. Organize and keep updated the program coordinator's files according to the norms and procedures in force, being responsible for the conservation, integrity and timely custody. Keep proper stock of office supply and necessary for the fulfillment of the work

l. Timely request maintenance and/or repair services for computers, telephone, and other similar of the coordinator and the supporting entities of the program

m. Keep record and control of documents and institutional bibliography of the program's document center.

n. Other functions assigned by the National Coordinator

Driver

a. Drive the vehicle of the Program (Headquarters, Zonal Directions and Zonal Agencies) with responsibility according to the internal norms of the Program

b. Watch for the good conservation and working of the assigned vehicle, requesting preventive or corrective maintenance, previous authorization of the program administration

c. Support in the development of assistance and auxiliary activities of the zonal

directions and agencies as well as the coordinators of irrigation infrastructure and water resources management in microwatersheds

d. Coordinate with public, private entities, organizations and others, according to instruction received from the program administration.

e. Other functions requested by the coordinators.

Coordination of Irrigation Infrastructure

Functions

- Manage, coordinate and direct the implementation of the program component in an articulated way, in order to achieve the objectives and goals of development programmed.
- Coordinate with the consultant conducting the international technical supervision aspects related to the execution of the program, fulfillment of quality and programmed time.
- Participate in the elaboration of the operative plan of the program execution for the five years and of each year with the support of the International Technical supervision
- Prepare annual budgets of the program component in articulation with the international consultant
- Inform about the monitoring and evaluation of the program component progress.
- Take the required measures for the timely negotiation for contracts and acquisitions for the implementation of the program, works execution and activities in coordination with the international consultant
- Monthly inform AGRORURAL planning office about the physical and financial progress of the programmed activities.
- Carry out monitoring inspections of the works execution activities, in each zonal direction and the training actions considered in the program
- Coordinate with the zonal directors and agency chiefs of AGRORURAL
- Responsible for the good use of the Program's resources

Coordinator of Water Resources Management in Microwatersheds

Functions

- Manage, coordinate and direct the implementation of the program component in an articulated way, in order to achieve the objectives and goals of development programmed.
- Coordinate with the consultant conducting the international technical supervision aspects related to the execution of the program, fulfillment of quality and programmed time.
- Participate in the elaboration of the operative plan of the program execution for the five years and of each year with the support of the International Technical supervision
- Prepare annual budgets of the program component in articulation with the

international consultant

- Inform about the monitoring and evaluation of the program component progress.
- Take the required measures for the timely negotiation for contracts and acquisitions for the implementation of the program, works execution and activities in coordination with the international consultant
- Monthly inform AGRORURAL planning office about the physical and financial progress of the programmed activities.
- Carry out monitoring inspections of the execution activities, in each zonal direction
- Coordinate with the zonal directors and agency chiefs of AGRORURAL
- Responsible for the good use of the Program's resources

Zonal Directions of AGRORURAL

Entities in charge of coordinating the program's activities in the corresponding area of competence, with the following functions:

a. Represent AGRORURAL program in all technical and administrative aspects, in the respective jurisdiction, based in the institutional policy

b. Direct, coordinate, concert, execute and supervise the technical and administrative actions developed in the framework of policies, programs and projects of AGRORURAL

c. Design, formulate and execute the operative plans corresponding to its jurisdiction, in direct coordination with the Regional Governments concerned

d. Coordinate and implement the necessary actions with the Regional Government, for the fulfillment of AGRORURAL's objectives and goals

e. Coordinate and implement the necessary actions with the private sector, for the fulfillment of AGRORURAL's objectives and goals

f. Carry out technical and administrative actions necessary to execute the projects that by decision of the Executive Direction, are to be executed by direct administration

g. Watch over for the strict fulfillment of norms and procedures of AGRORURAL in the different processes to be conducted in its jurisdiction financed by the Program

Irrigation Infrastructure Zonal Coordinators

Functions

- Support all actions required for the adequate execution of the program component in time and quality.
- Follow-up, monitoring and evaluation of the progress of programmed activities in the irrigation infrastructure component
- Have updated information corresponding to the component, to monthly inform the

physical and financial progress to the component's coordinator.

- Carry out actions requested by the Coordinator of Irrigation Infrastructure Coordinator
- Coordinate with the chiefs of zonal agencies of AGRO RURAL about the actions of supervisors.
- Coordinate with the manager of the zonal direction about the operational expenses of the Program.
- Coordinate with representatives of ANA and SENAMHI in the area for the activities considered in the Program.
- Request information to the supervisors of the zonal agencies.

ZONAL COORDINATOR OF WATER RESOURCES MANAGEMENT IN MICROWATERSHEDS

- Support all actions and documents required for the adequate execution of the program component in time and quality.
- Follow-up, monitoring and evaluation of the progress of programmed activities in the component water resources management in microwatersheds, in coordination with the component coordinator and the expert in water resources of the zonal agency.
- Conduct field evaluations at the fifty microwatersheds area of the component, in order to obtain updated information to monthly report the physical and financial progress.
- Carry out actions requested by the Coordinator of Water Resources Management in Microwatersheds
- Coordinate with the administrator of the zonal direction about the operational expenses of the Program.
- Coordinate with representatives of ANA and SENAMHI in the area for the activities considered in the Program.

Zonal Administrator

a. Coordinate administrative and financial conduction of the programs component, according to the procedures of the public sector, and JICA's when it corresponds.

b. Coordinate and provide administrative and financial information to the administrator of headquarters

c. Prepare and coordinate with the Administrator of the Program Headquarters the requests, records and funds retrieves, accountability of disbursements

d. Formulate the Annual Operative Budget, coordinating with the instances of the Program Headquarters.

e. Prepare financial projections, as well as evaluate the financial execution for the Program components

f. Dispose the adequate destination and application of funds, according to the

budget.

g. Coordinate with the Program Administrator, the priority criteria for the Program's resources distribution.

h. Formulate, propose and execute the Annual Plan of Acquisitions of goods and services, according to coordination with the program administrator

i. Direct, control, evaluate and supervise the processes of input, equipment, and spare parts, material and services acquisition to allow the normal functioning of the Program

j. Administrate the physical, financial and human resources required by the Program and optimize the good use of said resources

k. Carry out other similar and/or complementary functions assigned by the program administrator.

Zonal Agencies

a. Represent AGRORURAL program in all technical and administrative aspects, in the respective jurisdiction

b. Execute the technical and administrative actions developed in the framework of policies, programs and projects of AGRORURAL

c. Design, formulate and execute the operative plans corresponding to its jurisdiction, in direct coordination with the Local Governments concerned

d. Coordinate and implement the necessary actions with the Local Government, rural organizations, peasants communities and private organizations, for the fulfillment of AGRORURAL's objectives and goals

e. Carry out technical and administrative actions necessary to execute the projects that by decision of the Executive Direction are to be executed by direct administration and other modalities foreseen in the System of Acquisitions and Contracts of the State

f. Watch over for the strict fulfillment of norms and procedures of AGRORURAL in the different processes to be conducted in its jurisdiction financed by the Program

Supervisors of works execution will be located in the zonal agencies of AGRO RURAL, where a place and at least furniture and a portable PC will be provided for the management and works, to be hired by the international consultant.

Expert in Water Resources Management in Microwatersheds

In charge of the activities programmed for the component strengthening of water resources management at microwatershed level

Functions

- Prepare work plans and schedules together with the zonal coordinator of the component, according to the guidelines and the coordinator of the Program component
- Carry out the calls for meetings for the organization and/or strengthening of the Committee of water resources management at microwatersheds
- Coordinate activities for the participative planning and other methodologies of intervention at microwatershed level
- Develop coordination mechanisms with local institutions and organizations for the organization and consolidation of the Committees of water resources management at microwatersheds
- Visit all microwatersheds periodically during the execution period of the program component, supervising activities for the conformation of Committees of water resources management at microwatersheds and the characterization studies microwatersheds in accordance with the component coordinator
- Monthly submit reports of physical and budgetary progress to the coordination of the component and other instances of AGRORURAL
- Coordinate the corresponding to the meteorological stations in the microwatersheds and implement the follow up of data recollection
- Coordinate with the zonal coordination the systematization of experiences, the process of conformation of Committees of water resources management at microwatersheds and the studies of microwatersheds characterization
- Other activities that come up from the coordination conducted

COSTS OF ORGANIZATION AND MANAGEMENT OF THE PROGRAM

The total cost of the Program concerning administration and monitoring is S/. 26`708,845, amount comprising S/. 7`013,822 from headquarters and S/. 19`695,023 from the zonal directions as can be appreciated in the following Tables:

Table 3.13-1 Cost of Administration and Monitoring of the Program Headquarters

	DESCRIPTION	UNIT	Q'TY	COST UNIT.	COST TOTAL PRICE PRIV.	F.C	COST TOTAL PRICE SOC.
I	**MACHINARY A/O EQUIPMENT**						
	TRANSABLE						
	Computer	Nos.	11	4,500	49,500	0.84	41,597
	Vehicle 4x4 double cabin	Nos.	0	90,000	0	0.84	0
	Printer+Photocopy machine	Unit	2	8,000	16,000	0.84	13,445
	Multimedia equipment	unit	2	6,000	12,000	0.84	10,084
II	**MATERIALS A/O INPUTS**						
	NO TRANSABLE						
	Office utilities	L.S	1	36,000	36,000	0.84	30,251
	Fuel	Gallon	30,816	12	369,792	0.66	244,063
	Office furniture	unit	11	350	3,850	0.84	3,235
III	**MONPOWER**						
	SPECIALIZED						
	NO TRANSABLE						

	SPECIALIZED						
	Program Coordinator	M-M	60	12,000	720,000	0.909	654,545
	Assistant Coordinator	M-M	60	5,000	300,000	0.909	272,727
	Coordinator (Component A)i	M-M	60	10,000	600,000	0.909	545,455
	Coordinator (Component B)	M-M	60	10,000	600,000	0.909	545,455
	Monitoring (Component A).	M-M	60	5,000	300,000	0.909	272,727
	Monitoring (Component B)	M-M	60	5,000	300,000	0.909	272,727
	Administrator	M-H	60	8,000	480,000	0.909	436,364
	Accountant	M-H	60	5,000	300,000	0.909	272,727
	Finance	M-H	60	3,000	180,000	0.909	163,636
	specialist in acquisition	M-H	60	3,000	180,000	0.909	163,636
	Secretary	M-H	60	3,000	180,000	0.909	163,636
	Driver	M-H	120	2,000	240,000	0.909	218,182
IV	**SERVICES**						
	TRANSABLE						
	Baseline Survey	Global	1	450,000	450,000	0.909	409,091
	Interim Evaluation	Global	1	400,000	400,000	0.909	363,636
	Final Evaluation	Global	1	450,000	450,000	0.909	409,091
	NO TRANSABLE						
	Auditor	Global	4	200,000	800,000	0.909	727,273
	Operation cost	month	60	500	30,000	0.84	25,209
						0.84	0
						0.84	0
						0.84	0
	Others	Number	174	40	6,960	0.84	5,848
	Cleaning	Number	216	45	9,720	0.84	8,168
	SUBTOTAL				**7,013,822**		**6,272,809**

Following, we present the Table Summary of the 9 Zonal Directions of AGRO RURAL (considering one Additional Direction in Piura)

Table 3.13-2 Cost of Follow-Up and Supervision of the Program in the 9 Zonal Directions

	DESCRIPTION	**UNIT**	**Q'TY**	**COST UNIT.**	**COST TOTAL PRICE PRIV.**	**F.C**	**COST TOTAL PRICE SOC.**
I	**MACHINARY A/O EQUIPMENT**						
	TRANSABLE						
	Computer	Nos.	27	4,500	121,500	0.84	102,101
	Vehicle 4x4 double cabin	Nos.	0	90,000	0	0.84	0
	Printer + Photocopy machine	unit	9	8,000	72,000	0.84	60,504
II	**MATERIALS A/O INPUTS**						
	NO TRANSABLE						
	Office utilities	L.S	1	363000	363,000	0.84	305,029
	Fuel (*)	Gallon	524,009.40	12	6,288,113	0.66	4,150,154
	Office furniture	unit	27	350	9,450	0.84	7,941
III	**MANPOWER**						
	SPECIALIZED						
	Coordinator for project of program	M-M	486	8,000	3,888,000	0.909	3,534,545

	Coordinator for Watershed	M-M	486	7,000	3,402,000	0.909	3,092,727
	Administrator	M-M	486	4,000	1,944,000	0.909	1,767,273
	Driver (*)	M-M	1404	2,000	2,808,000	0.909	2,552,727
IV	**SERVICES**						
	TRANSABLE						
	NO TRANSABLE						
	OPERATION COST	Month	486	500	243,000	0.84	204,202
	water	Month	486	50	24,300	0.84	20,420
	Electricity	Month	486	60	29,160	0.84	24,504
	Fixed telephone line	Month	486	60	29,160	0.84	24,504
	Internet	Month	486	100	48,600	0.84	40,840
	Local	Month	486	500	243,000	0.84	204,202
	Others (*)	Nos.	1929	40	77,160	0.84	64,840
	Washing and lubricant(*)	Nos.	2324	45	104,580	0.84	87,882
	SUBTOTAL				**19,695,023**		**16,244,397**
	TOTAL				**26,708,845**		**22,517,206**

PROGRAM EXECUTION MODALITY

It has been considered to recommend the execution of the program in a mixed form, detailed as follows for each component:

Component A: it is recommended to execute by contract in all activities for the investments are high in all its activities.

Component B: it is recommended to be executed under Direct Administration, considering that the institution will participate through facilitation and supervision, for many private entities are unaware of the integral way of said activities.

JUSTIFICATION TO EXECUTE BY DIRECT ADMINISTRATION

Agro Rural has technicians and administrators at national level in the respective Zonal Directions and Agencies, as well as infrastructure and basic equipment to be promoters and supervisors of the component B execution. It can be observed by the organizational Table of AGRO RURAL.

ESTRUCTURA FUNCIONAL DE AGRORURAL

COMPONENT B JUSTIFICATION OF COSTS

Component B budget is presented as follows in two modalities, for the execution by Direct Administration and by Contracting at private prices. It can be appreciated in the following Tables:

Table 3.13-3 Component B Budget by Direct Administration S/.

	ACTIVITY	UNIT	QUANTITY	TOTAL
	COMPONENT B strengthening water resources management in microwatersheds			17,994,250
I	Detailed Design	UNIT	50	469,000
II	Characterization of Water Resources of the microwatershed			6,603,568
	- Identification of water resources availability and zones of productive intensification / analyses of conflicts	UNIT	50	6,603,568
III	Committee of Water Resources Management in Microwatersheds conformed and strengthened carries out activities of water and productive resources management			10,921,682
	Awareness rising for Water resources management in microwatersheds	Glob	1	954,655
	Organization for the conformation and formalization of Committee of Water Resources Management in microwatershed	Glob	1	1,356,078
	Actions of management of Committee of Water Resources Management in microwatershed	Glob	1	2,115,446
	Equipment for the monitoring of water resources and meteorology	Glob	1	5,141,935
	Recovering knowledge	Glob	1	1,353,568
				2033

Table 3.13-4 Budget of Component B by Contract S/.

	ACTIVITY	UNIT	QUANTITY	TOTAL
	COMPONENT B strengthening water resources management in microwatersheds			17,994,250
I	Detailed Design	UNIT	50	469,000
II	Characterization of Water Resources of the microwatershed			6,603,568
	- Identification of water resources availability and zones of productive intensification / analyses of conflicts	UNIT	50	6,603,568
III	Committee of Water Resources Management in Microwatersheds conformed and strengthened carries out activities of water and productive resources management			10,921,682
	Awareness rising for Water resources management in microwatersheds	Glob	1	954,655
	Organization for the conformation and formalization of Committee of Water Resources Management in microwatershed	Glob	1	1,356,078
	Actions of management of Committee of Water Resources Management in microwatershed	Glob	1	2,115,446
	Equipment for the monitoring of water resources and meteorology	Glob	1	5,141,935
	Recovering knowledge	Glob	1	1,353,568
	Utilities			1`799,425
	Income taxes			539,827.5
	Total			20`333,502

As can be appreciated in the two Tables of component B budget, the amount by contract is higher than the direct administration in more than two million soles, motive by which we have considered the execution by direct administration.

3.14 Implementation Plan

3.14.1 Methodology of the Program Implementation

(a) Call for Tender and Public Bidding.

Due to the limited time available for the implementation of projects, the studies should be prepared in a determined period, through contract with local consultants considering one (1) study for each consultant or consulting company and published at national, regional and local level.

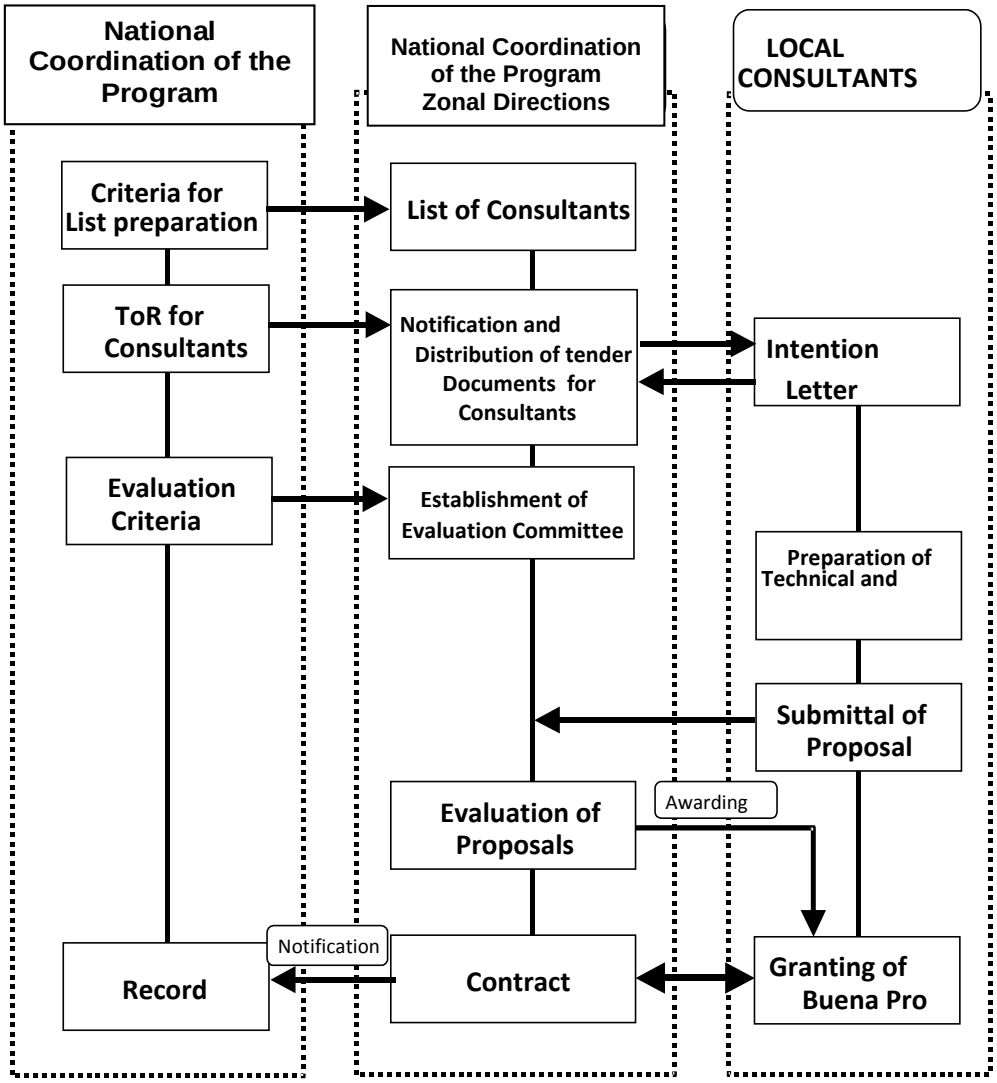
There are many projects, between 2 and 13 for each department or Zonal Direction, so, in order to implement the program in the shortest period it is necessary to implement them as indicated in the previous paragraph. For this reason, as it is difficult to make a pre-classification evaluation separately for each department, a short list of companies will be prepared according to only one criterion to all departments, proposals will be evaluated and the Consultant for each project will be selected, as well as the construction companies for the execution of the irrigation infrastructure projects.

The terms of Reference (ToR) and selection criteria will be prepared by personnel of the National Coordination of the Program in Headquarters and in the Zonal Directions to evaluate with a strict selection.

The contents of the studies and designs will be at constructive level of each project and the following basic items will be considered, including others according to the magnitude and complexity of the projects engineering:

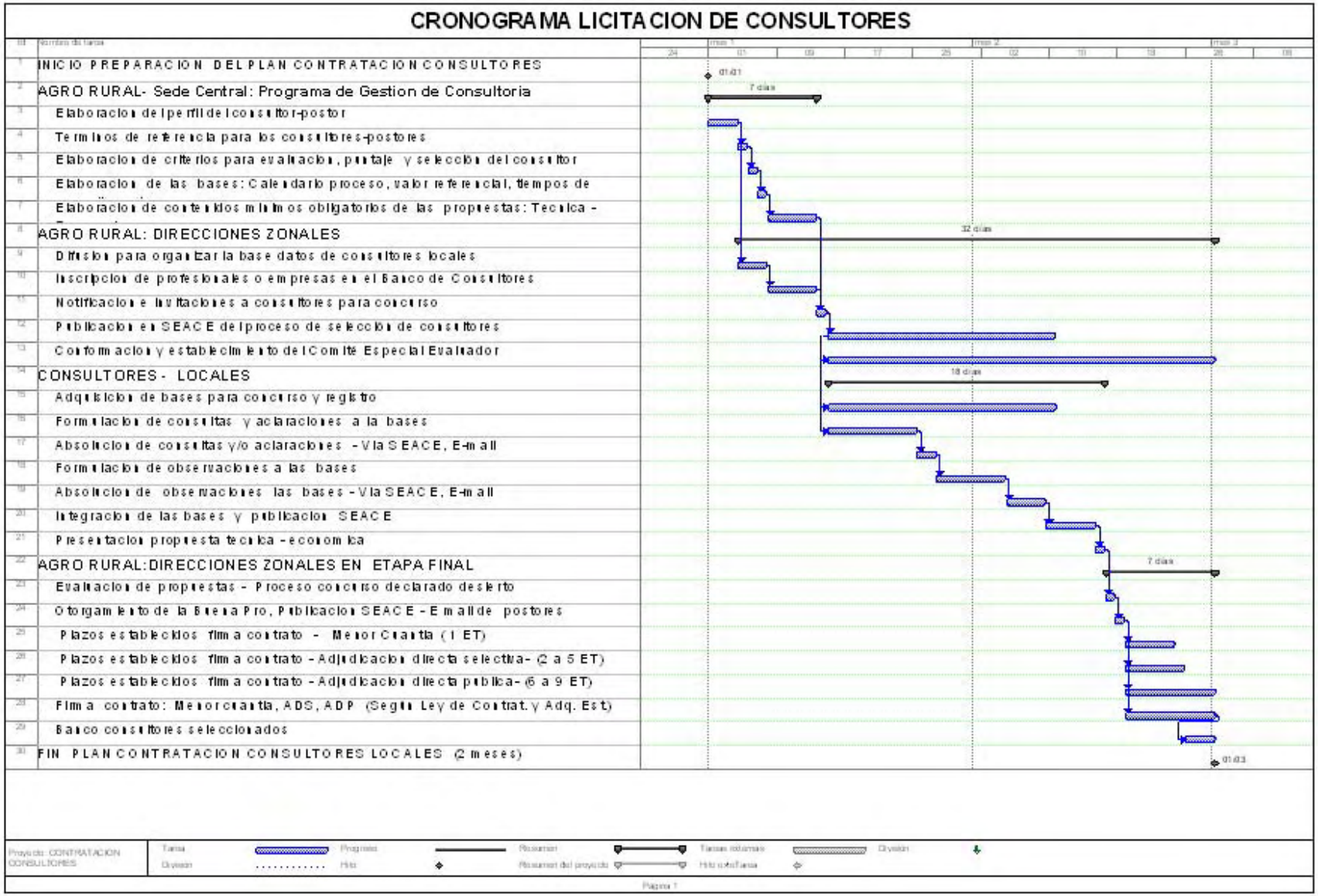
- Measurements, Geological, geotechnical and geophysical studies, (*) （*necessary for dams, canals, catchments, special structures (aqueducts, siphons, etc.), dam, quarries.
- Topographic survey at the adequate scale for the designs
- Hydrologic study for the water resource and agriculture demand issue. Water analysis.
- Calculation of hydraulic structures design.
- Floor, profile and cross-section drawings of hydraulic structures.
- Descriptive memory of the project.
- Agronomic Study.
- Budget, unit cost, input
- Schedule of execution and disbursement.
- Technical specifications.
- Environmental study

Flow and stages for local consulting selection

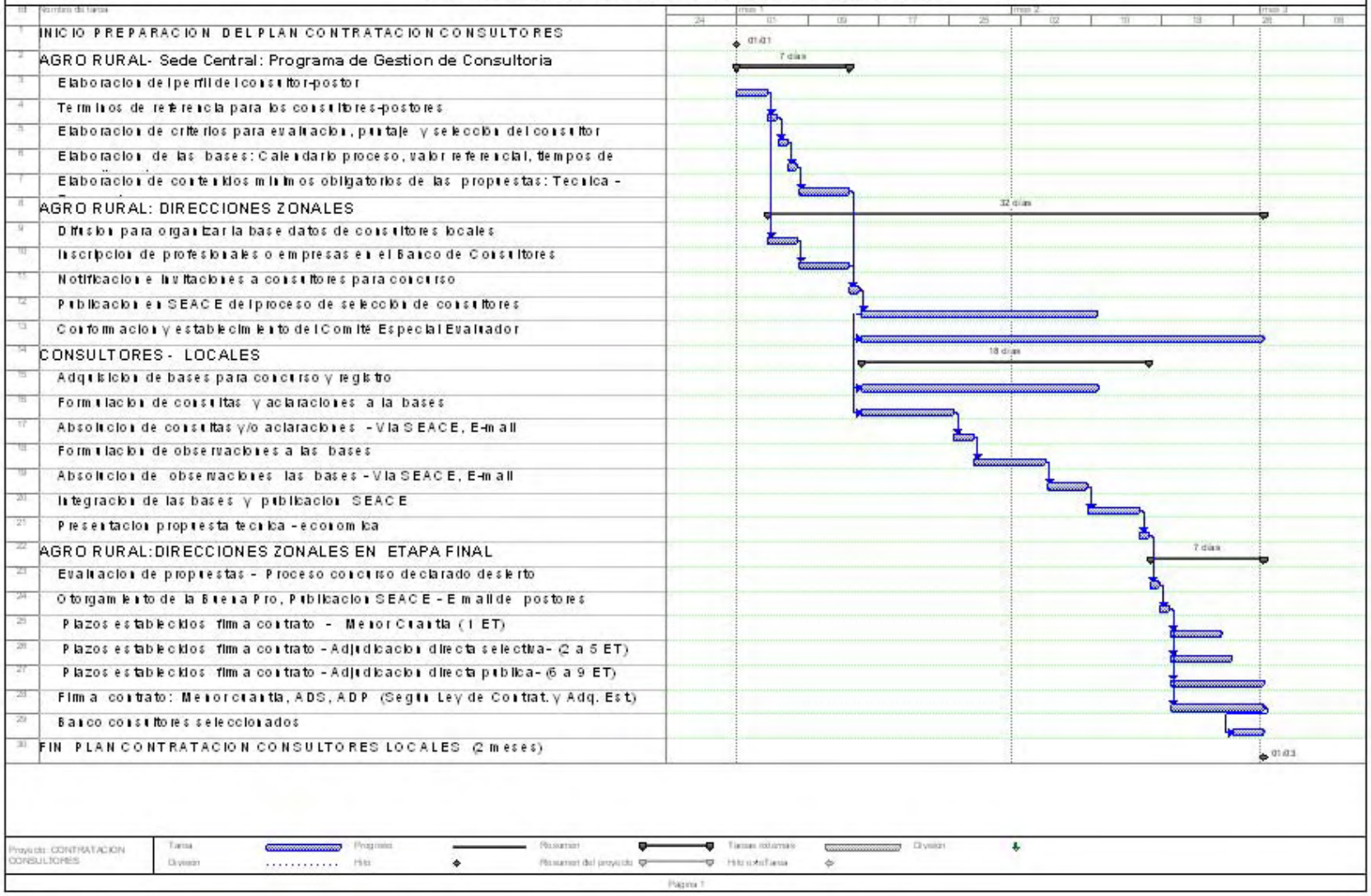


Local Consultants selection procedure are as follows;

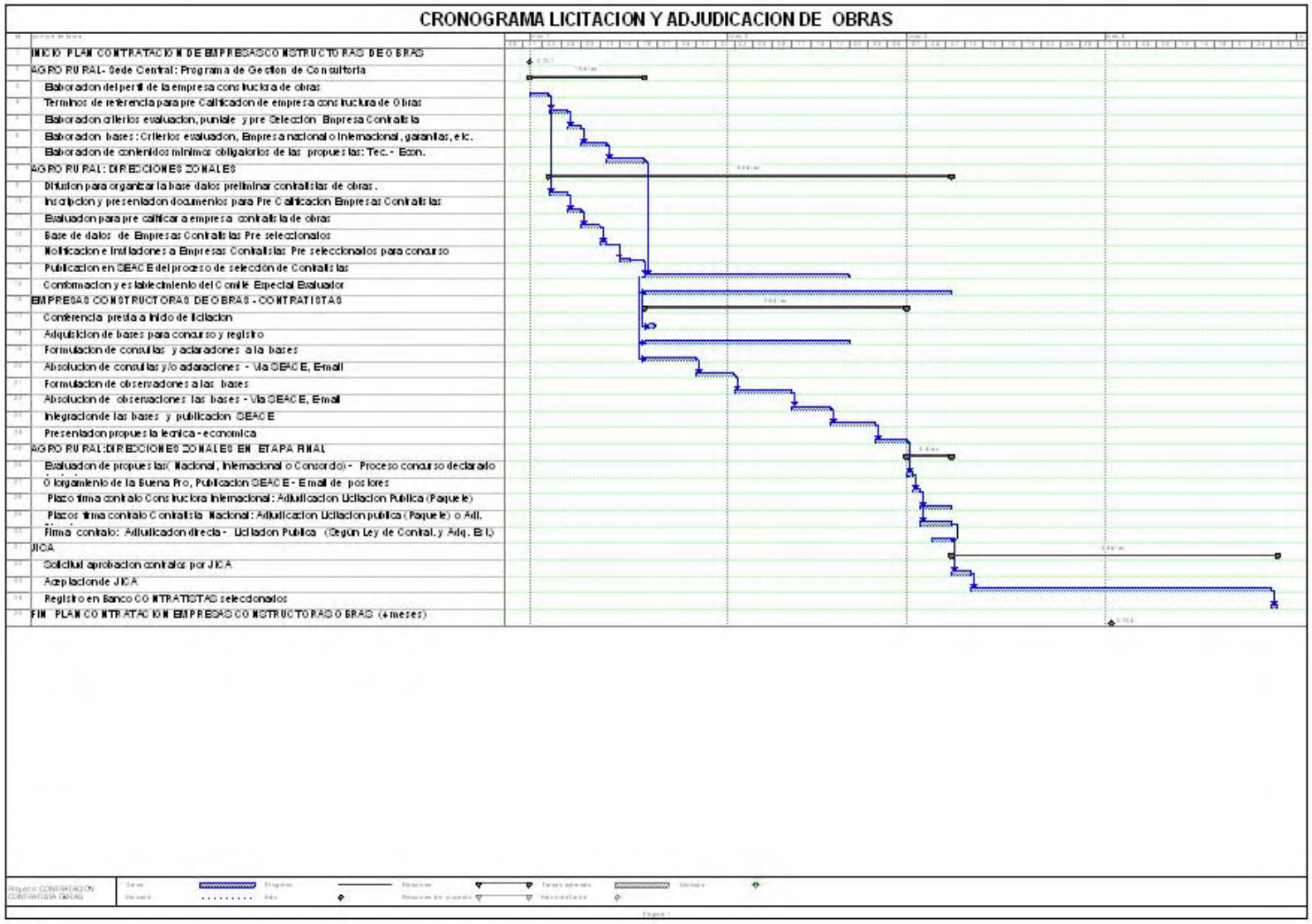
CRONOGRAMA LICITACION DE CONSULTORES



CRONOGRAMA LICITACION DE CONSULTORES



CRONOGRAMA LICITACION Y ADJUDICACION DE OBRAS

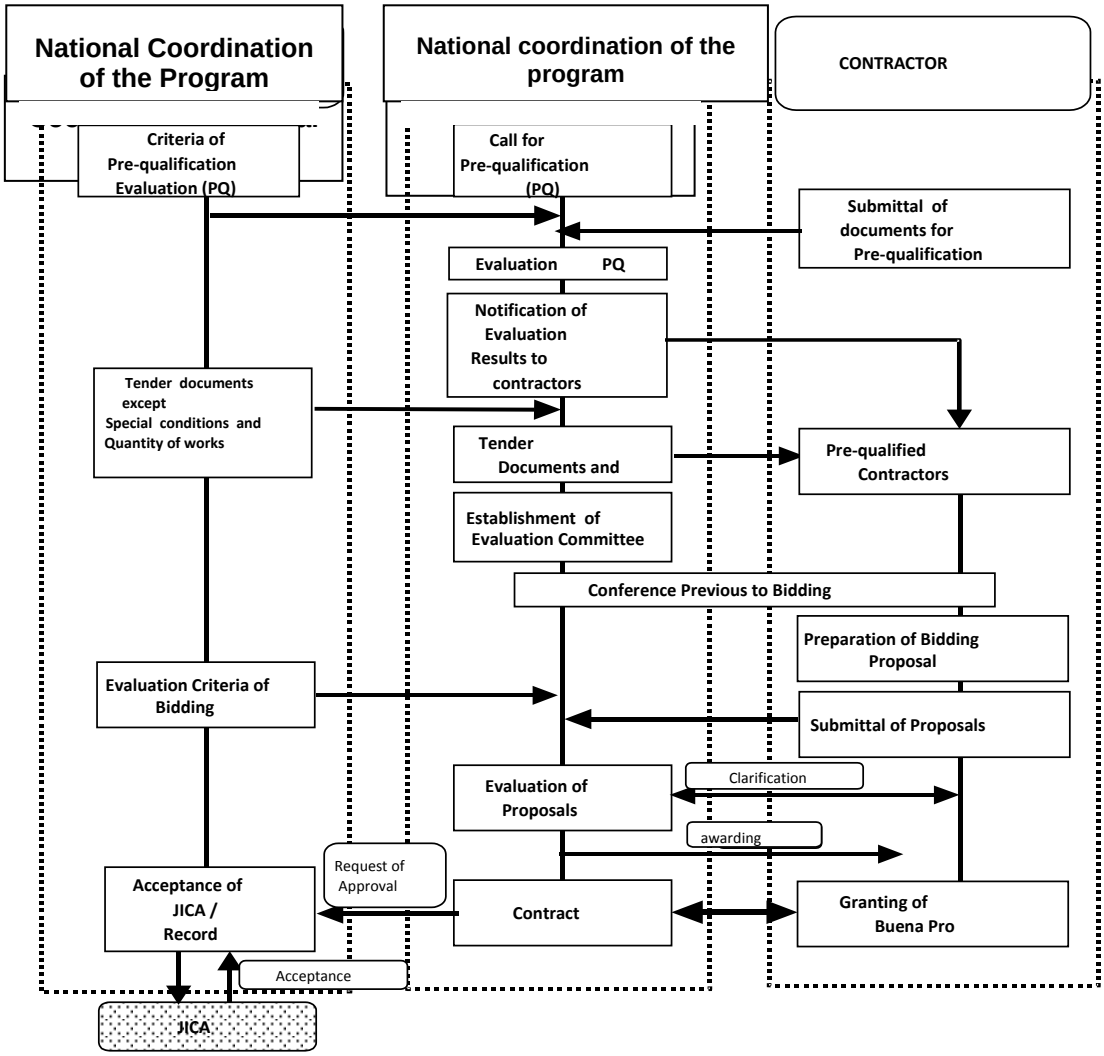


The Program will be in charge of preparing and redacting the documents necessary for the works tender. The contracting system will be the modality of closed proposals, besides; the pre-qualification documents as well as the evaluation criteria will be prepared.

- Tender Documents, General and specific conditions of the contract, General and technical specifications.
- Criteria of Tender Evaluation.

The call for pre-qualification, evaluation of pre-qualified, bidding and evaluation will be conducted by the evaluation committee chosen by the departmental management of Agro Rural with the advisement of the Supervisor Consultant of the program.

Flow and stages for procedures of construction awards



(b) Supervision of Works and payment administration according to the works progress

Due to AGRORURAL's Zonal Agencies limitation of personnel, experts in works supervision and activities of component A will be called for contracting, as well as the water resources experts of component B.

The National Commission of the Program will be in charge of preparing the Manual of Works supervision and other activities of the program.

Contracted personnel will have support of the Zonal Coordinator of the Program, who will be informed about the physical and financial progress of the projects execution.

3.14.2 National Coordinator of the Program

The responsibilities of the National Coordination team will be the following:

Component A

a. Prepare the Pre-qualification documents and evaluation criteria for the Pre-qualification for Works contracts.

b. Prepare the tender documents (draft) and prepare the evaluation criteria for the Works contract tender.

c. Advise Zonal Directions to Contract Local Consultants

d. Provide technological support to zonal directions of Agro Rural for the supervision of local consultants (Design・Cost)

e. Orientation to the local consultant in special technical aspects such as Water Balance, Geology and others.

f. Advise in the bidding for works contract.

g. Prepare the manual of construction and supervision of Works

h. Training of local consultant and personnel in charge of departmental management in Works supervision.

i. Technological support to the zonal directions and zonal directions of Agro Rural in the supervision of environmental impact studies by the local consultant.

j. Periodical supervision and technical orientation of the Works administration.

k. Provide support to the zonal directions of Agro Rural in the progress of works and request of payment of the same.

l. Conduct training and prepare necessary material for the entity in charge of conforming and/or strengthening the entities in charge of the Irrigation System administration.

m. Provide advisement in the elaboration of construction designs of lateral canals and others.

n. Inspection of lateral canals construction works and others.

o. Evaluation and Monitoring of benefits of the Project, Base guidelines studies and monitoring

p. Monitoring of environmental impact during the works.

Component B

a. Collection of documents concerning microwatersheds conservation plans. Updating of GIS database.

b. Elaboration of an Action Plan sample for the Project of Microwatersheds Conservation.

c. Train the personnel in charge of the Project of water resources management in microwatersheds of Agro Rural

d. Assistance in the conformation of the commission for the water resources management in microwatersheds.

e. Elaboration of the necessary material for the institutional strengthening of the Microwatershed conservation / Coordination with the commission for the water resources management in microwatersheds.

f. Elaboration of the necessary material for the organizational strengthening of the agricultural producers Association

g. Train the members of the commission for the water resources management in microwatersheds.

Related Services and others

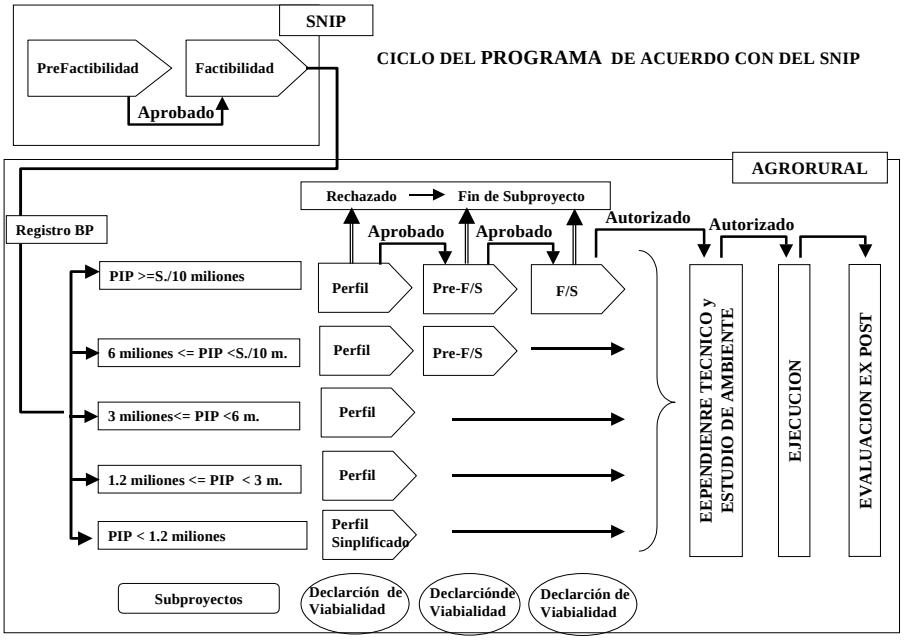
a. Proposal of a cultivation plan proper for each project of component A

b. Proposal of proper cultivation for the implementation of technical assistance.

c. Collaboration with agricultural supporting entities in each department.

3.14.3 Implementation Strategy

The implementation of Component A, considering the characteristics of "Irrigation Infrastructure" and the projects integrating it.



Projects integrating the Program will be declared feasible according to SNIP regulations and according to the agreements with OPI Agriculture and with the DGPM of the Ministry of Economy and Finances.

In order to implement the approved projects it is necessary to have the respective Perfil. In this process it is possible that some projects would have to be replaced. Due to the short period of the Program implementation or in case they are already under implementation, the new projects to be submitted should be quite advanced. From this assumption, new projects to be submitted should fulfill the following selection criteria shown in the following Table.

Table 3.14.1 shows the criteria to consider new projects by substitution, due to geographical, social or risky reasons among others, presented during the implementation process.

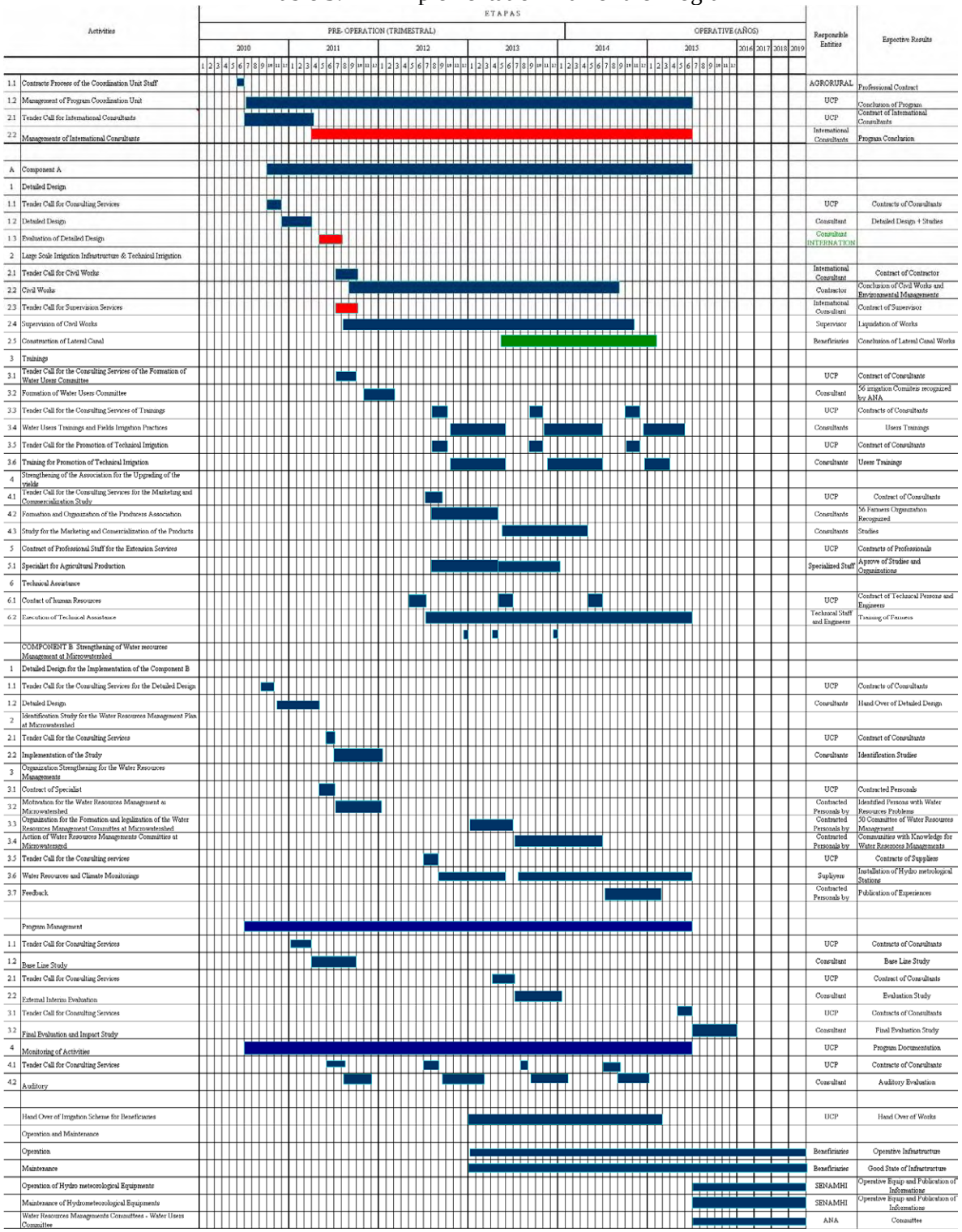
Table 3.14-1
Basic criteria for the selection of new project

Criteria			
Conditions	Item		Explanation
Social Conditions	I-1	Poverty Zone	Located in one of the 9 departments of the Program
	I-2	Request of Agro Rural	The document of right of use of water can be obtained through request of the irrigation committee or farmers association
Technical Conditions	II-1	To have perfil and minutes of commitment	For technical evaluation, agreement commitments of operation and maintenance, contribution to the project of 10% of the direct cost of works
	II-2	Availability of water resources	Document of ALA respect to the authorization of water resources for the project. Analysis of water balance; for dams a basic hydrologic study of the collecting watershed.
Economic Conditions	III-1	Amount of Investment	It should be equal, higher or lower than 10% of the non considered project budget
	III-2	Internal Rate of Return (IRR)	The Perfil indicates private IRR higher than 10% and social IRR higher than 14%

3.14.4 Schedule of the Program Implementation Plan

The Program is going to be implemented in two stages: pre-operative and operative. The first stage has a duration of four years and a half; corresponding to the execution of all activities foreseen for each one of the two components of the Program. The second stage basically refers to the operation and maintenance of the Program's projects. The detail of activities by component, more administration and management expenses of the Program; as well as the entities in charge and the expected results are shown in Table N° 3.14.1 and for further details see Annexes.

Table 3.14-2 Implementation Plan of the Program



3.15 Financing

The program financing with a total cost of S/. 238`684,826 equivalent to 83`165.445 dollars, is distributed in three financial sources that are:

- External debt through the Japan Bank of the International Cooperation Agency JICA, by an amount of 50`000,000 dollars, representing 60.12%. of the total budget of the program.
- Ordinary Resources of the Agriculture Sector through AGRO RURAL of 32`065,922 dollars representing 38.56% of the total budget of the program.
- Beneficiaries with a contribution of 1`099,522 dollars representing 1.32% of the total budget of the program.

In the following Table the distribution by each component can be seen; it should be stressed that administrative expenses is considered in 68% of ordinary resources and 32% through external debt; also it can be appreciated that investment in an average of 81% is centered in constructive activities of component A and in strengthening water resources management.

Table 3.15-1
Distribution of financial sources of the Program

	Activity	Unit	Qty	TOTAL	Percentage	Investments Distribution (S/.)						
						JICA		RO-AGRO-RURAL		BENEFICIARY		
						S/.	%	S/.	%	S/.	%	TOTAL
	COMPONENT A Irrigation Infrastructure			174,484,702	73.10%	124,002,971	71.07%	47,326,102	27.12%	3,155,629	1.81%	174,484,702
I	Detailed Design and Study	Unit	56	2,177,963		0	0.00%	2,177,963	100.00%		0.00%	2,177,963
II	Infrastructure											0
	Irrigation Work	Unit	56	133,189,042		106,468,308	79.94%	26,720,733	20.06%	0	0.00%	133,189,042
	Environments	Unit	56	382,564		321,482	84.03%	61,082	15.97%	0	0.00%	382,564
	General Expenditure	Unit	56	6,719,924		5,646,995	84.03%	1,072,929	15.97%	0	0.00%	6,719,924
	Supervision Expenditure	Unit	56	13,763,762		11,566,186	84.03%	2,197,575	15.97%	0	0.00%	13,763,762
III	Training											0
	Formation of Irrigation Committee	Unit	56	63,845		0	0.00%	63,845	100.00%	0	0.00%	63,845
	Training for Water Use and Irrigation Practices	Unit	56	421,595		0	0.00%	421,595	100.00%	0	0.00%	421,595
	Promotion of Technical Irrigation	Unit	56	2,136,966		0	0.00%	2,136,966	100.00%	0	0.00%	2,136,966
IV	Strenthgning of Association for the Upgrading of Yields											
	Organized and Formalized Farmers	Unit	56	892,311		0	0.00%	892,311	100.00%	0	0.00%	892,311
	Marketing and Productive Chain Study	Unit	56	2,024,960		0	0.00%	2,024,960	100.00%	0	0.00%	2,024,960
	Supervisor	Unit	56	406,800		0	0.00%	406,800	100.00%	0	0.00%	406,800
V	Assistance											
	Technical Assistance	Unit	56	9,149,343		0	0.00%	9,149,343	100.00%		0.00%	9,149,343
VI	Lateral Canals											
	Lateral Canals	Ls	1	3,155,629		0	0.00%	0	0.00%	3,155,629	100.00%	3,155,629
	COMPONENT B Strenthgning of Water Resources Management at Micro Wathershed			17,994,250	7.54%	0	0.00%	17,994,250	100.00%	0	0.00%	17,994,250
I	Detailed Design for Implementation	Unit	50	469,000		0	0.00%	469,000	100.00%		0.00%	469,000
II	Identification of Water Resources at Microwatershed											0
	Identification of Water Resources Potentiality, Land Use Plan and Conflicts Analysis	Unit	50	6,603,568		0	0.00%	6,603,568	100.00%		0.00%	6,603,568
III	Water Resources Management Committee and Strengthening of Water Resources Management											0
	Motivation of Water Resources Managements at Micro watershed	Ls	1	954,655		0	0.00%	954,655	100.00%		0.00%	954,655
	Organization for the Formation and Formalization of Water Resources Managements at Micro Watershed	Ls	1	1,356,078		0	0.00%	1,356,078	100.00%		0.00%	1,356,078
	Action of Water Resources Managements at Microwatershed	Ls	1	2,115,446		0	0.00%	2,115,446	100.00%		0.00%	2,115,446
	Monitoring Equipment for the Hydro Climatologically Stations	Ls	1	5,141,935		0	0.00%	5,141,935	100.00%		0.00%	5,141,935
	Feed Back	Ls	1	1,353,568				1,353,568	100.00%		0.00%	1,353,568
	COMPONENT C			39,372,540	16.50%	12,663,696	32.16%	26,708,845	67.84%	0	0.00%	39,372,540
I	Administration and Monitoring Management	Ls	1	26,708,845			0.00%	26,708,845	100.00%		0.00%	26,708,845
II	International Supervision	Ls	1	12,663,696		12,663,696	100.00%		0.00%		0.00%	12,663,696
	SUBTOTAL			231,851,493		136,666,667	58.95%	92,029,196	39.69%	3,155,629	1.36%	231,851,493
	Contingency			6,833,333	2.86%	6,833,333	100.00%	0	0.00%		0.00%	6,833,333
	TOTAL COST			238,684,826	100.00%	143,500,000	60.12%	92,029,196.42	38.56%	3,155,629	1.32%	238,684,826
	TOTAL COST (US$)			83,165,445	100.00%	50,000,000	60.12%	32,065,922	38.56%	1,099,522	1.32%	83,165,445

3.16 Logical Framework of the Program

OBJECTIVES	GOALS	INDICATOR	VERIFICATION MEANS	ASSUMPTIONS
END Contribute to improve the life level of rural families in poverty zones lacking water	...	...	...	...
PURPOSE Increase agricultural production of rural families in poverty zones	By the end of the Program: -Improvement of 18, 103 hectares of cultivation areas with irrigation. -Incorporation of 20,659 hectares to cultivation. -Favored production increase in average 44%	-N° of ha improved with irrigation each semester. -Percentage of average increase of production annually	-Annual Operative Plans. -Annual Reports. -Mid-term evaluation	No presence of catastrophic climate phenomena
COMPONENTS C1.- The zones of agrarian and rural poverty have improved their availability of water resources for cultivations as organized farmers to generate innovations and a better destination for their production	By the end of the Program: -Achieve the increase water availability through construction of Infrastructure of Irrigation with 56 works. -Capacities of **56** groups of beneficiaries of works, organized in irrigation committees and trained for the system O&M	-N° of hectares improved with Irrigation by semester. -N° of hectares incorporated with Irrigation by semester. -No. of farmers sensitized and with experiences in the advantages of technical irrigation - -N° of users organizations acknowledged by semesters -N° of semester producers who improved the operation capacity of their irrigation systems. -N° of water user organizations improved as organized producers..	- Operative Plans of PIP - Monitoring reports - Monitoring Reports	Beneficiaries maintain their attitudes and good will to participate in the Program
C2.- Rural Families and local actors have improved their capacities to participate in the water resources Management at Microwatershed level and generate sustainability in water conservation	By the end of the Program: -Water resources management institutionalized at the level of 50 Andean Microwatershed. -There are 50 Studies of Microwatersheds characterizations for decision making in relation to water resources Conservation and management -	-N° of water management committees at Microwatershed level conformed and legalized. -N° of committees conformed conducting water management actions at the entire Microwatershed level. -N° of Basic meteorological stations installed and in operation.	- Management reports - Monthly and mid-year reports - Annual reports - Mid-term evaluation	There is no presence of catastrophic phenomena to affect the progress of the Program implementation and Works execution
C3.- Management, Coordination, Supervision, Monitoring and Evaluation of the Program	By the end of the Program: - 20 Quarterly reports of execution progress prepared. - 5 annual reports of execution progress have been prepared. -01 Base line Study	-N° of quarterly reports of program execution management. -N° of annual reports of program execution management. - Evaluation studies.		

	-01 Study of intermediate evaluation. etc.			
ACTIVITIES				
1.1 Presentation of the Program and Call to the Authorities, Local Organizations and Actors	**COST OF COMPONENTE A S/. 174`484,702** Considered for 56 irrigation works of 56 irrigation committees, minimum of 56 organizations of producers to receive technical assistance for each project of this component **COST OF COMPONENT B** **S/. 17`994,260** **Considers the organization of 50 committees of water resources management** **ADMINISTRATION AND MONITORING OF THE PROGRAM** **S/. 39`372,540.00** **Considered in the technical-financial administration by the Coordinating Unit of the Program and international technical supervision.** **Contingencies** **S/. 6`833,333** **The Total Investment of the program to improve living conditions of 24,849 families is S/. 238,684,826** **Investment corresponds to US$ 83`165,445;** **ÙS$ 50`000,000 is financed through public loan to JICA, US$ 32`065,922 through national treasure, and US$ 1`099,522 by beneficiaries** **Execution period : 5 years**			
1.2 Actions of Promotion, sensitization and commitments in the scope of Intervention.				
1.3 Confection List of Work for Bidding and Schedule				
1.4 National Bidding for Works construction				
1.5 Execution of Irrigation Infrastructure Works				
1-6. Training, live experiences, formation of organizations and formalization				
2.1 Workshops of Sensitization, Identification, Participation and Commitments in the scopes of the Program				
2.2 Training in Organization and Legalization of Water Management Committees of Microwatersheds.				
3.1 Call of Personnel to complete the executing unit				
3.2 Implementation of the executing unit				
3.3 Start of the Investment Program Execution				

3.17 Base Line for Impact Evaluation

I) General Objective

To know the economic and social incremental benefits of rural families obtained from the construction of irrigation infrastructure and the conformation of Committees of Water Resources Management in Microwatersheds for a higher availability and efficient use of irrigation water; and also, the conformation of agribusiness.

II) Specific Objective

To establish an adequate knowledge of the socioeconomic situation of the actors considered as recipient of the Program's benefits former to the implementation of irrigation works, through the preparation of a base line with clearly identified indicators, to provide the necessary information to start the activities of the Program and allow measure the changes occurred. Additionally, provide information about some specific aspect requiring a study or need of investigation.

III) Justification

Global Warming is a modification directly or indirectly attributable to human activities that alter the global atmospheric composition, added to the natural climatic change observed in comparable periods of time.

In our country, climate phenomena like droughts, frosts, floods, etc., cause not only material damage but also affect population health by increasing risks of Acute Breath Infection and also cause damage to cattle and agriculture.

Most part of agriculture is conducted in rain fed land, and as it is common knowledge, climate change is altering the rainfall behavior and with that the sowing and harvest period, that obviously affects in great part the most vulnerable farmer families, for not only income is reduced by the surplus commercialization but also their own food security is put into danger.

In this context, base line study is considered as an important tool to measure two distinct moments, before and after the execution of the Program, in which it is possible to have a qualitative and quantitative knowledge of the achieved changes, especially from the main actors' perspectives.

In general, a base line study is useful both for the follow up of activities as well as for the interim, final and impact evaluations.

IV) Strategy

For the Base Line elaboration process, the following strategies are proposed:

a) Considering the heterogeneity of the national territory, information of each project individually and of the projects conforming the conglomerate will be collected, So there would be as many base lines as number of defined projects, but later the systematization of all of them will generate only one coherent, objective and trustful document at national level.

b)

c) The most relevant indicators will be identified both related with the use of financial resources, coverage, income, production and productivity, fulfilling the minimum requisites of quality, quantity and time.

d)

e) Trustfulness, objectivity and independency will be looked for in the field data collection.

f)

g) With the purpose of assuring transparence during the field data collection, actions of supervision during the information recollection process could be in charge of local governments in each of the jurisdictions the projects are located, depending on the coordination and strategic alliances made. Formalization of their participation would be through agreements or minutes of commitments and will count on with technical assistance and logistic support of the Zonal Directions and Agencies and/or operative Units of AGRORURAL.

h)

i) Information collected in the field will be centralized in the zonal directions and the National Coordination of the Program, so the Consultant's staff conducts quality control, coding and consistency analysis in case some inconsistency is identified in the recorded data that could be easily corrected by going back to the study zone.

j)

k) The processing of information will be carried out by using software of ad hoc statistic packages, for the elaboration of exit Tables according to the requirements of the identified indicators, and the respective analysis according to the ToR of the base line to be formulated in its opportunity.

l)

m) The analysis, systematization and formulation of the base line and the evaluation results will be permanently supervised by experts of the program and will be transmitted to the MINAG's OPI, AGRORURAL, MEF's DGPM and JICA.

n)

o) The elaboration of the Terms of Reference and the national call for tender will be in charge of a national commission for the program, according to the norms in force, both of the Peruvian State and the Financing Entity.

V) Methodology

The methodology to be employed is framed in three clearly defined stages:

The first stage, consists in a desk work for data collection from secondary sources, definition of indicators, elaboration of questionnaires, guide of questions for the focus groups, preparation of documents to effectuate the strategic alliances with local governments, etc. and the definition of the statistically representative sample, with an error margin of 5%., conformation of work groups, elaboration of the consultant's activity Plan, including a detailed schedule of activities to be developed in each defined zone.

The second stage is fundamentally a field work, for primary information data collection, by application of quantitative surveys (application of questionnaires with questions especially formulated according to the indicator previously defined) and qualitative (talks or guided interviews to key actors and focus groups).

Surveys will be questionnaires with a combination of open and closed questions allowing a qualitative and quantitative analysis of results.

The application of surveys and the realization of focus groups will be monitored by the personnel of the de liaison office and will count on with the participation of the local governments in activities of quality control and supervision.

The third stage is a desk work to carry out coding, according to the quality control and consistency analysis of all information collected in the field.

Field information processing including data typing, cross of variables and formulation of exit Tables will be in charge of the consultant's experts.

The analysis of information, redaction and systematization of results, both the base line as the evaluations will be in charge of the consultant's multi-disciplinary experts.

VI) Indicators

The impact indicators measure fundamental positive changes in some aspect of the population lives or in the ecosystem. They are synergic results generated by effect of the Program's projects; they can occur:

i) For social aspects, main indicators are: reduction in malnutrition indicators, improvement in familiar diet, improvement in housings roofs and floors, acquisition of electric appliances, migration, etc.,

ii) For economic aspects, main indicators are: generation of labor force, increase of income, increase in crops productivity, increase in production volume, higher food security, higher supply of products, changes in the production destination, increase commercial flow (sales and purchase of goods and services), increase in land value, etc.,

iii) For cultural aspects, main indicators are: technology transfer, (good agricultural practices, efficient use of irrigation water, etc.), reduction of illiteracy, recreation, strengthened management of peasants organizations, etc.,

iv) For environmental aspects, main indicators are: improvement of landscape, ecologic tourism, decontamination, etc.

v) For project sustainability, main indicators are: capacity of continue the projects actions with autonomy and without the intervention of the project, irrigation infrastructure maintenance and operation, irrigation users' organization, joint management of needs and production, conformation and working of the committees of watershed management in microwatersheds.

VII) Schedule of Activities for the Base Line Study Elaboration

The elaboration period for the study considers 7 months.

Table 3.17-1 Schedule of the Study Elaboration

Item	Months						
	1	2	3	4	5	6	7
- Recompilation of documents, studies and analysis of relevant information from secondary sources							
- Definition of base line indicators and definition of the statistically representative sample							
-- Elaboration of questionnaires with closed and open questions							
-Elaboration of question guides for focus groups							
- Documents of formalization for inter-institutional participation							
- Discussion of questionnaires, Validation of surveys and training of surveyors							
- Organization of working groups according to the established fronts and according to the characteristics of the program projects							
-Field work: application of individual surveys and focus groups							
- Coding, consistency analysis, data input and field data processing							
- Analysis, redaction and submittal of preliminary final report of base line							
-Revision of draft final report							
-Clearance of observations and final report submittal							

VIII) Budget breakdown for the elaboration of the base line study of the Program

The base line study will be called for at national level to be prepared by the consultant.

Following the breakdown Table of the contents for the terms of reference at all costs is presented as follows.

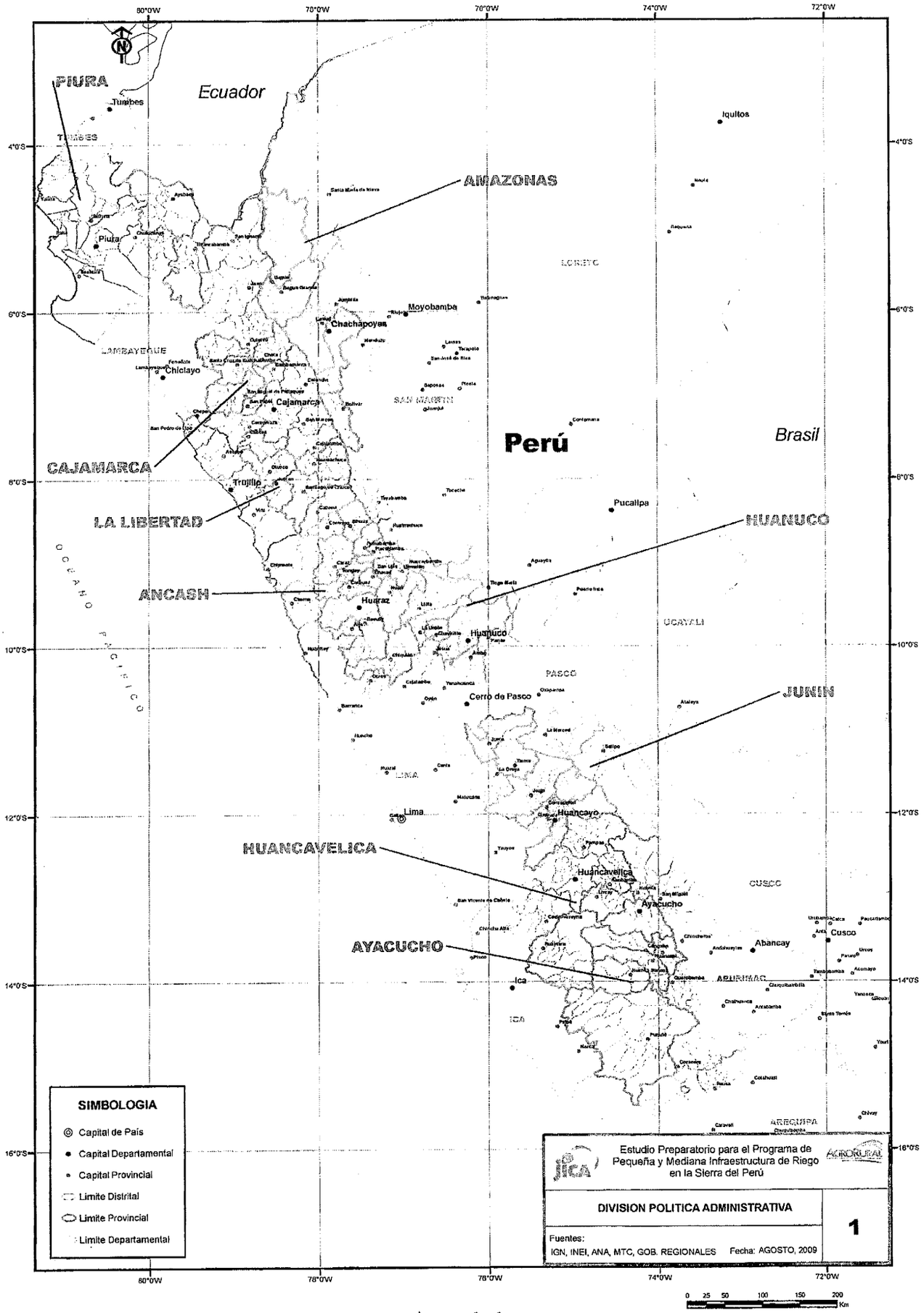
Table 3.17-2 Budget for the Elaboration of the Base Line Study of the Program

Item	Unit	Unit Cost	Time	Quantity	Total S/.
I. Fees					
Chief consultant	Month	6,000.0	7	1	42,000.0
Experts	Month	5,500.0	6	4	132,000.0
Surveyors	Days	50.0	30	40	60,000.0
II. Operative					
2.1 Local vehicle					
Experts	Days	30.0	30	5	4,500.0
Surveyors	Days	10.0	30	40	12,000.0
2.2 Per diem					
Chief consultant	Days	160.0	30	1	4,800.0
Experts	Days	150.0	30	4	18,000.0
Surveyors	Days	25.0	30	40	30,000.0
2.3 Operative vehicle rental	Days	500.0	30	9	135,000.0
2.4 Validation of surveys	Global				1,845.0
2.5 Training surveyors	Days	35.0	3	40	4,200.0
2.6 Office supply and printing	global				5,655.0
Total					**450,000.0**

ANEXOS

1. INDICE DE MAPAS TEMÁTICOS

Índice de Mapas Temáticos: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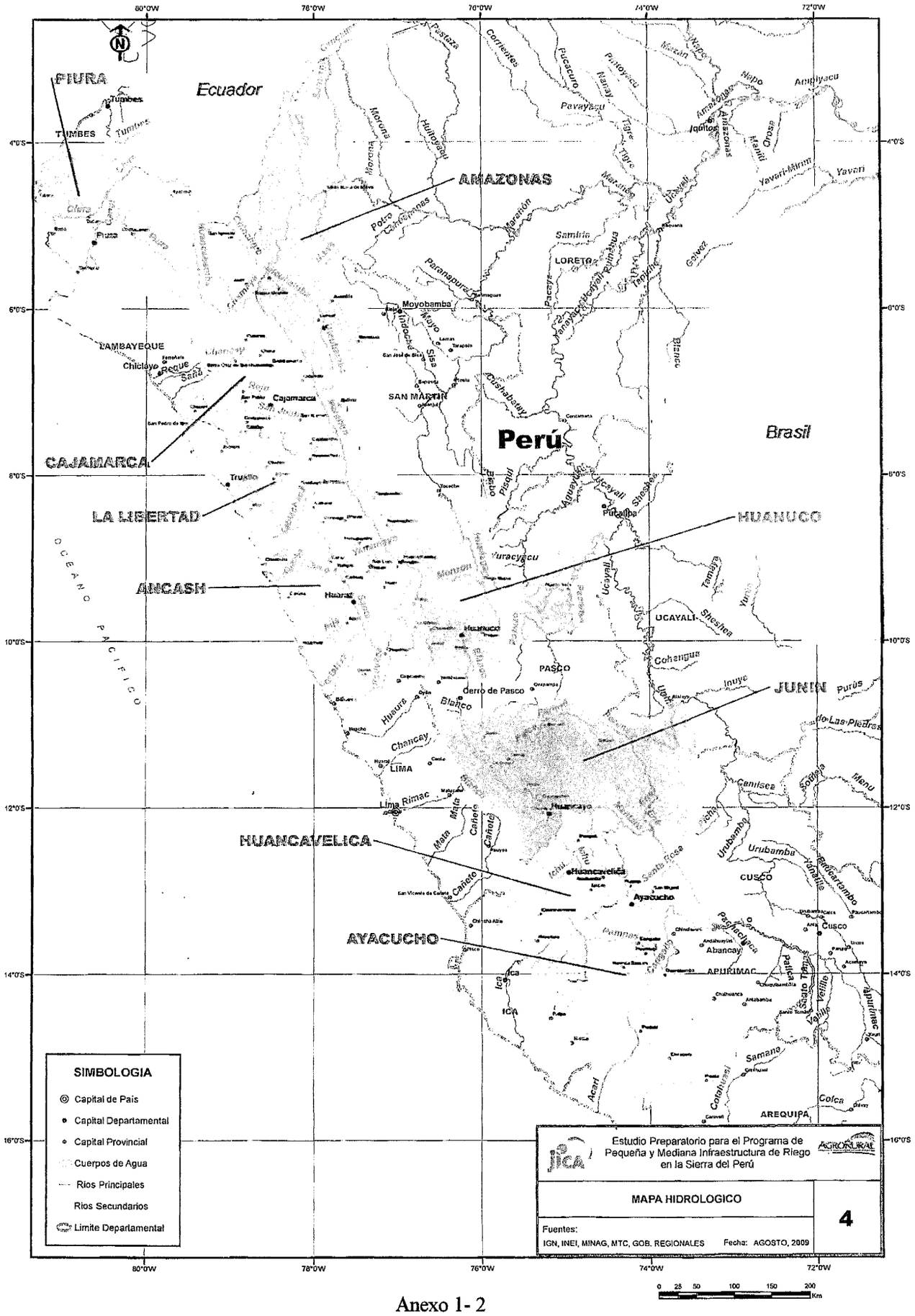
Anexo 1- 1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Rios Secundarios
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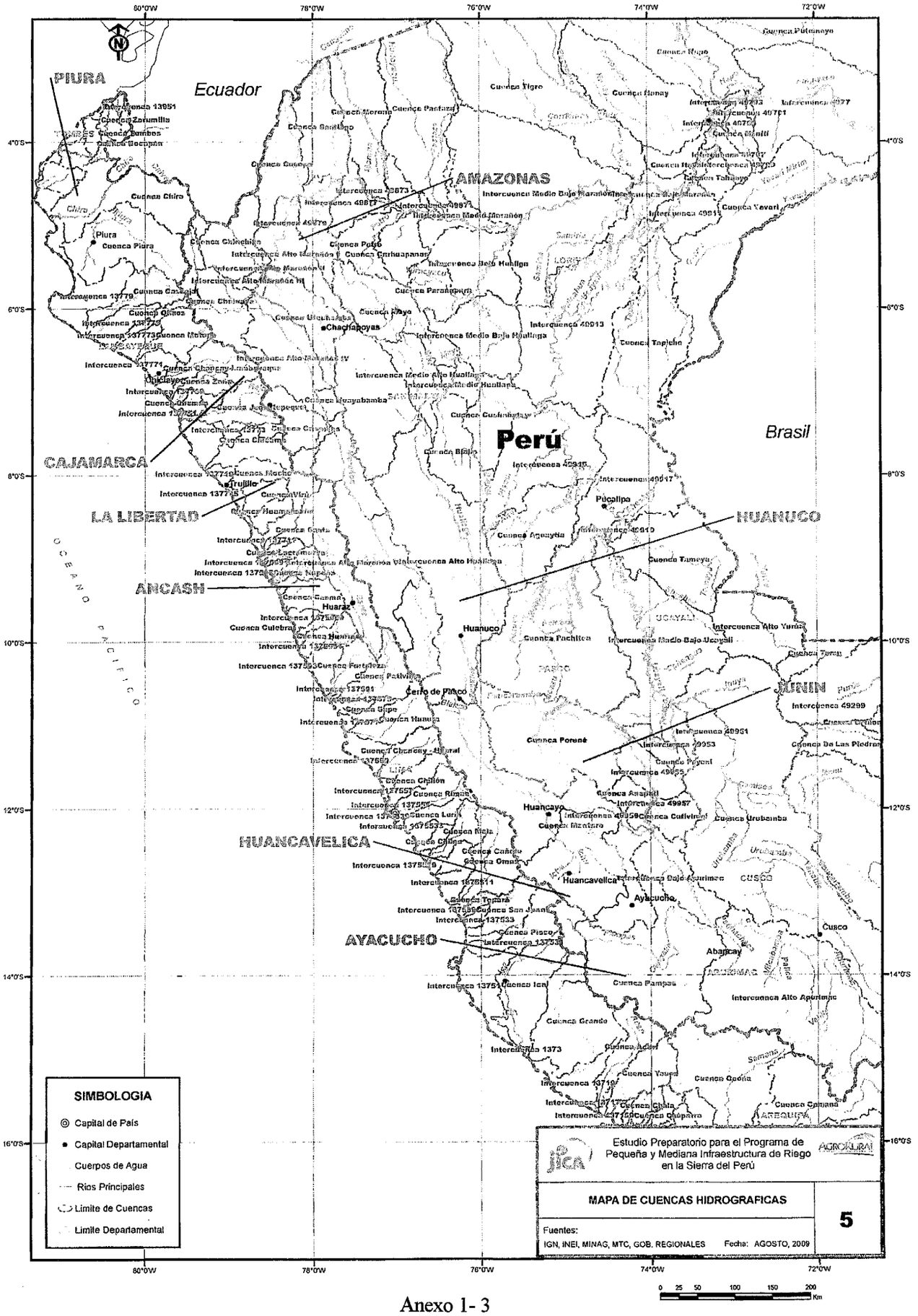
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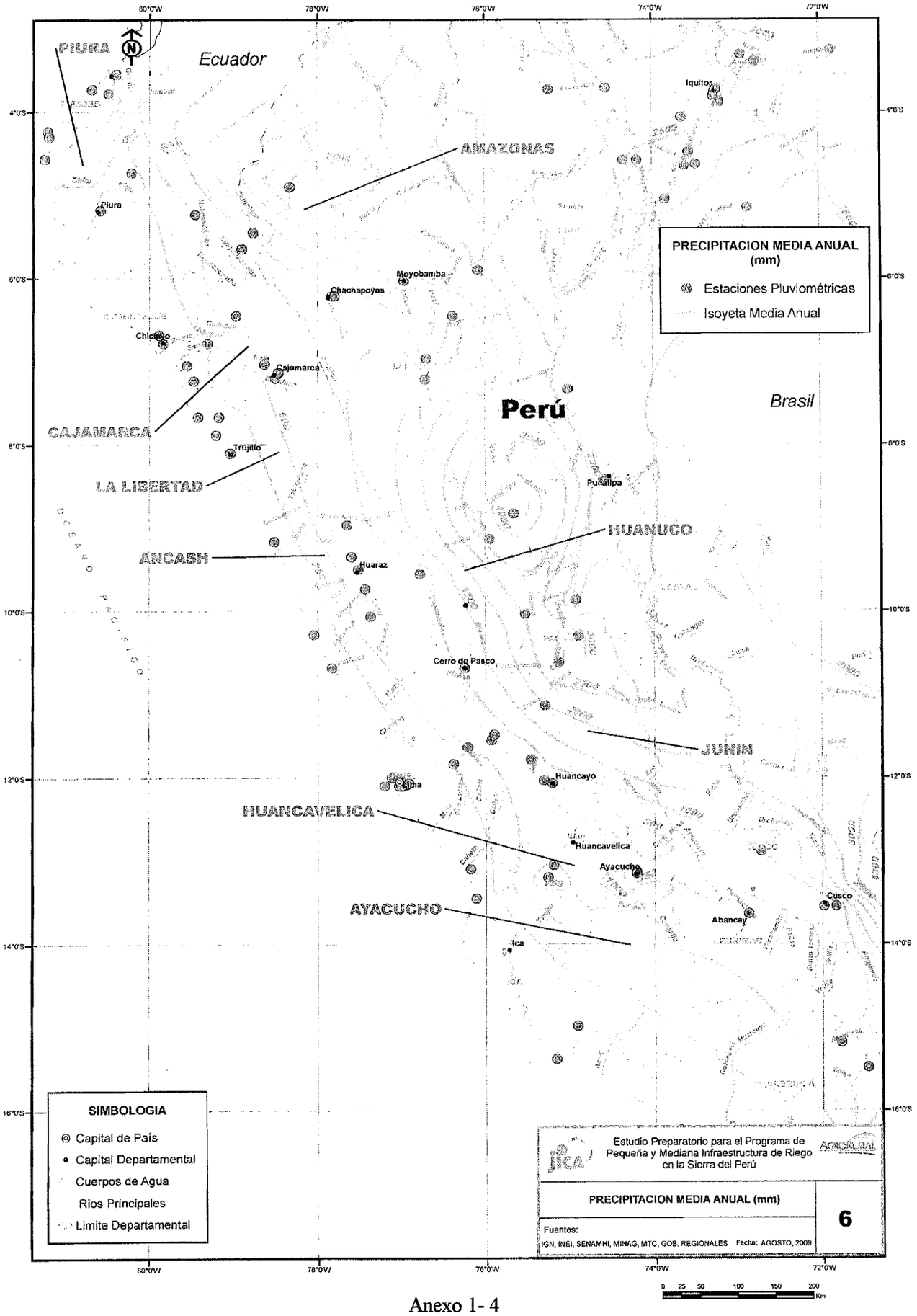
Anexo 1- 3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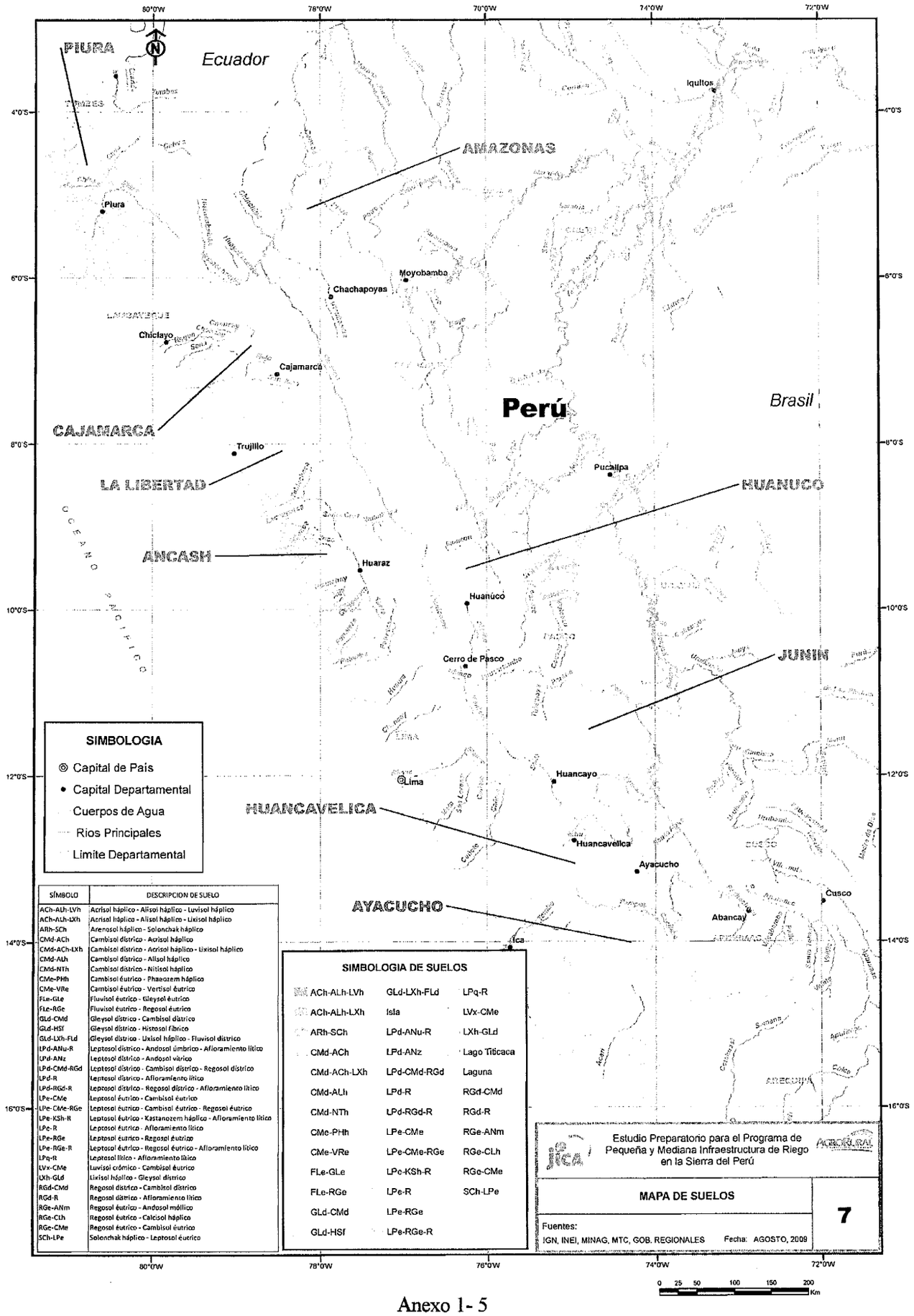
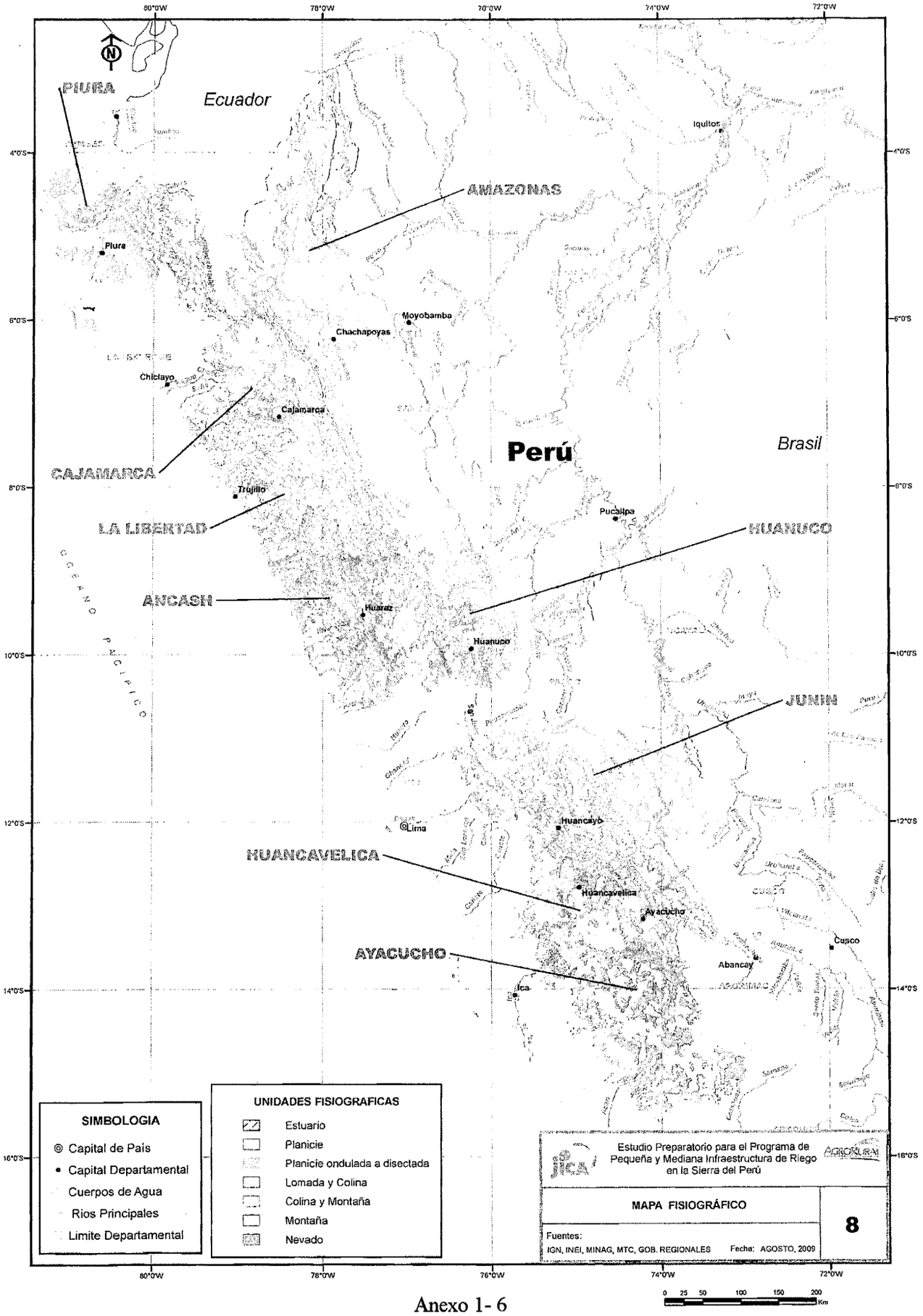
Anexo 1- 4



SÍMBOLO	DESCRIPCION DE SUELO
ACh-ALh-LVh	Acrisol háplico - Alisol háplico - Luvisol háplico
ACh-ALh-LXh	Acrisol háplico - Alisol háplico - Lixisol háplico
ARh-SCh	Arenosol háplico - Solonchak háplico
CMd-ACh	Cambisol dístrico - Acrisol háplico
CMd-ACh-LXh	Cambisol dístrico - Acrisol háplico - Lixisol háplico
CMd-ALh	Cambisol dístrico - Alisol háplico
CMd-NTh	Cambisol dístrico - Nitisol háplico
CMe-PHh	Cambisol éutrico - Phaeozem háplico
CMe-VRe	Cambisol éutrico - Vertisol éutrico
FLe-GLe	Fluvisol éutrico - Gleysol éutrico
FLe-RGe	Fluvisol éutrico - Regosol éutrico
GLd-CMd	Gleysol dístrico - Cambisol dístrico
GLd-HSf	Gleysol dístrico - Histosol fíbrico
GLd-LXh-FLd	Gleysol dístrico - Lixisol háplico - Fluvisol dístrico
LPd-ANu-R	Leptosol dístrico - Andosol úmbrico - Afloramiento lítico
LPd-ANz	Leptosol dístrico - Andosol vítrico
LPd-CMd-RGd	Leptosol dístrico - Cambisol dístrico - Regosol dístrico
LPd-R	Leptosol dístrico - Afloramiento lítico
LPd-RGd-R	Leptosol dístrico - Regosol dístrico - Afloramiento lítico
LPe-CMe	Leptosol éutrico - Cambisol éutrico
LPe-CMe-RGe	Leptosol éutrico - Cambisol éutrico - Regosol éutrico
LPe-KSh-R	Leptosol éutrico - Kastanozem háplico - Afloramiento lítico
LPe-R	Leptosol éutrico - Afloramiento lítico
LPe-RGe	Leptosol éutrico - Regosol éutrico
LPe-RGe-R	Leptosol éutrico - Regosol éutrico - Afloramiento lítico
LPq-R	Leptosol lítico - Afloramiento lítico
LVx-CMe	Luvisol crómico - Cambisol éutrico
LXh-GLd	Lixisol háplico - Gleysol dístrico
RGd-CMd	Regosol dístrico - Cambisol dístrico
RGd-R	Regosol dístrico - Afloramiento lítico
RGe-ANm	Regosol éutrico - Andosol mólico
RGe-CLh	Regosol éutrico - Calcisol háplico
RGe-CMe	Regosol éutrico - Cambisol éutrico
SCh-LPe	Solonchak háplico - Leptosol éutrico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Lomada y Colina
Colina y Montaña
Montaña
Nevado
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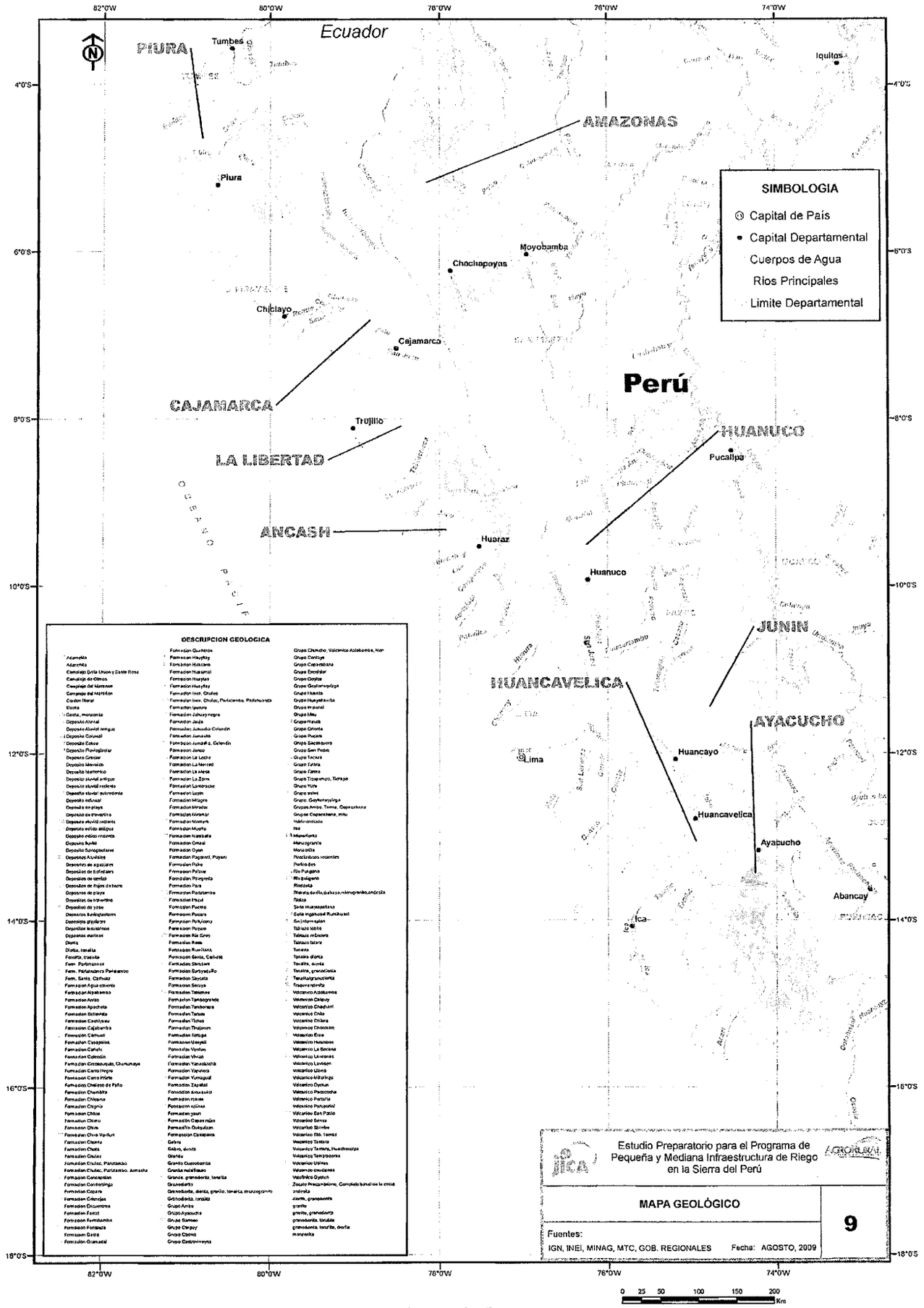
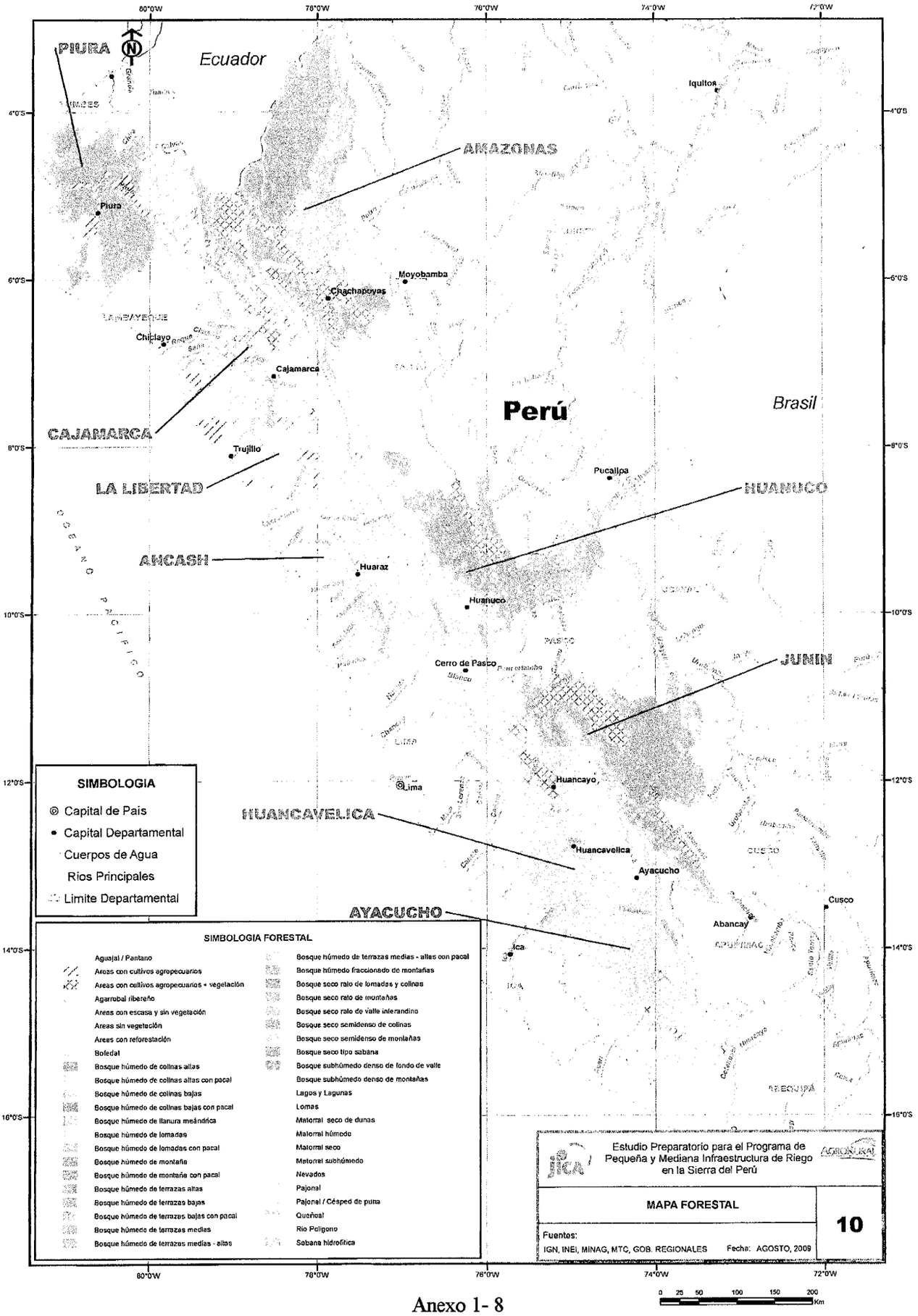
Km

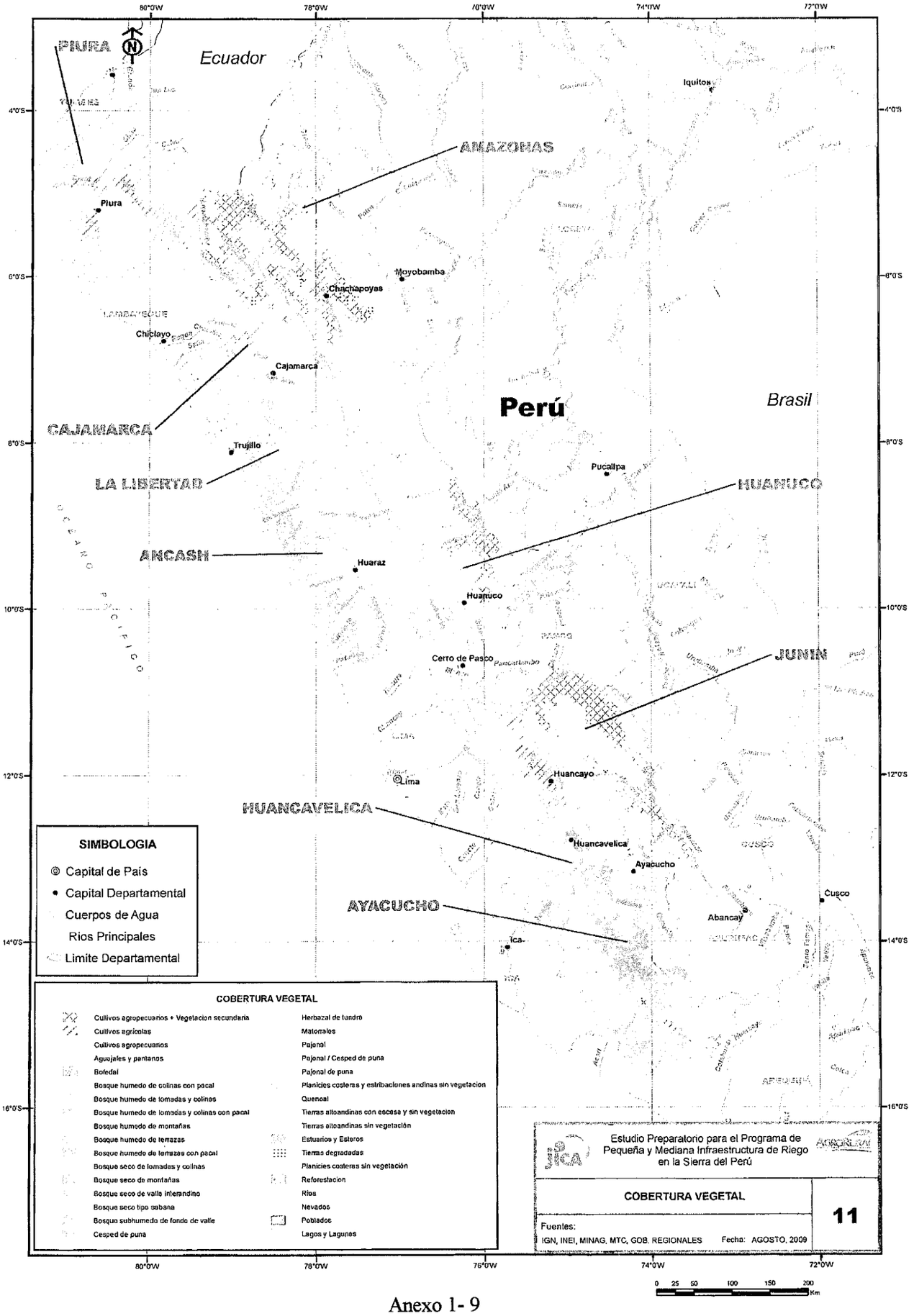
Anexo 1- 6


Ecuador
PIURA
Tumbes
Iquitos
AMAZONAS
Piura
SIMBOLOGIA
Capital de País
Capital Departamental
Cuerpos de Agua
Rios Principales
Limite Departamental
Moyobamba
Chachapoyas
Chiclayo
Cajamarca
Perú
CAJAMARCA
Trujillo
HUANUCO
Pucallpa
LA LIBERTAD
ANCASH
Huaraz
Huanuco
JUNIN
HUANCAVELICA
AYACUCHO
Lima
Huancayo
Huancavelica
Ayacucho
Abancay
Ica
DESCRIPCION GEOLOGICA
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
MAPA GEOLÒGICO
9
Fuentes:
IGN, INEI, MINAG, MTC, GOB. REGIONALES
Fecha: AGOSTO, 2009
82°0'W
80°0'W
78°0'W
76°0'W
74°0'W
4°0'S
6°0'S
8°0'S
10°0'S
12°0'S
14°0'S
16°0'S
18°0'S
0 25 50 100 150 200
Km

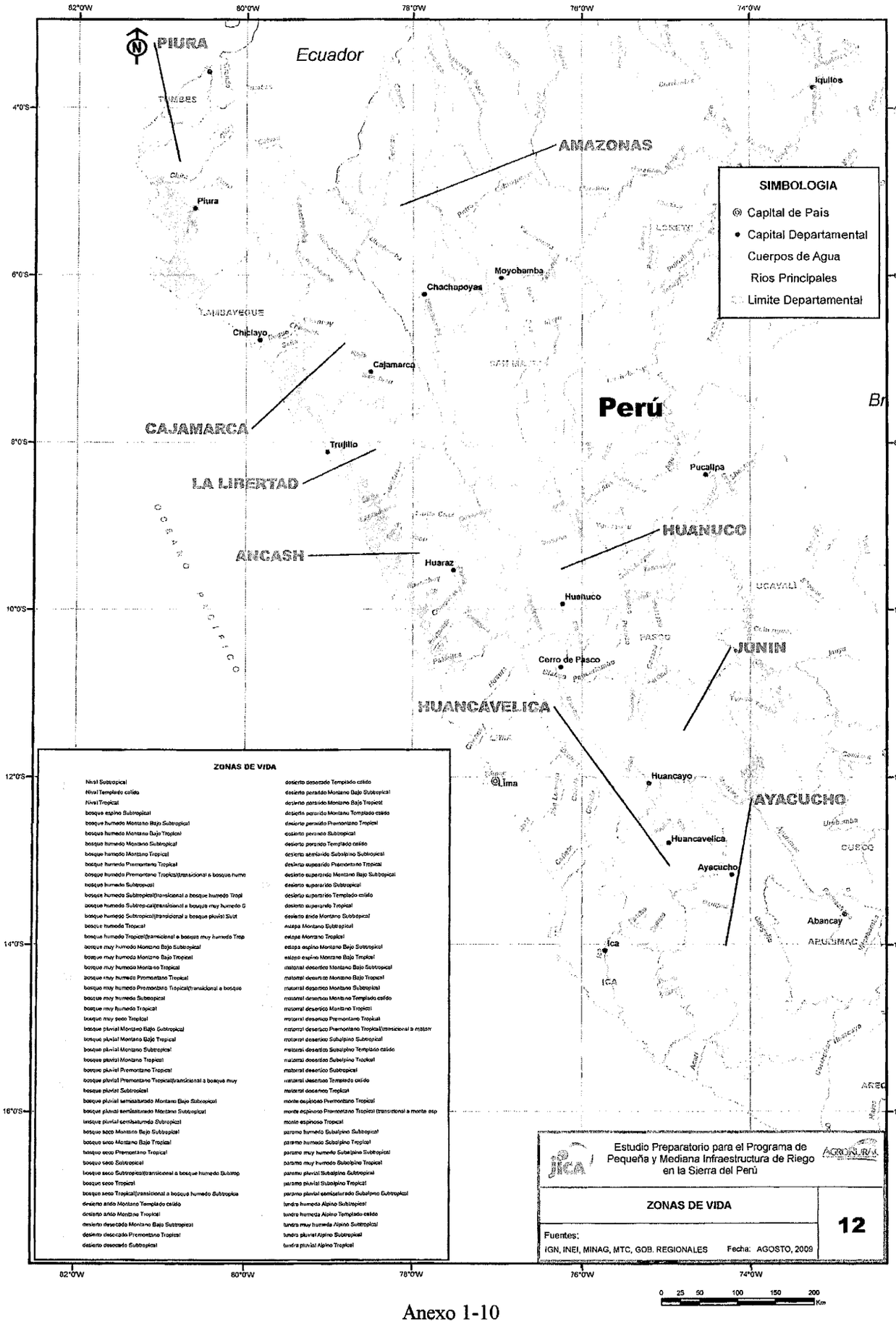
Anexo 1- 7


80°0'W
78°0'W
76°0'W
74°0'W
72°0'W
4°0'S
6°0'S
8°0'S
10°0'S
12°0'S
14°0'S
16°0'S
PIURA
Ecuador
AMAZONAS
Iquitos
Piura
Moyobamba
Chachapoyas
LAMBAYEQUE
Chiclayo
Cajamarca
CAJAMARCA
Perú
Brasil
Trujillo
LA LIBERTAD
Pucallpa
HUANUCO
ANCASH
Huaraz
Huanuco
PASCO
Cerro de Pasco
JUNIN
Lima
Huancayo
HUANCAVELICA
Huancavelica
Ayacucho
CUSCO
Cusco
AYACUCHO
Abancay
APURIMAC
Ica
AREQUIPA
SIMBOLOGIA
Capital de Pais
Capital Departamental
Cuerpos de Agua
Rios Principales
Limite Departamental
SIMBOLOGIA FORESTAL
Aguajal / Pantano
Areas con cultivos agropecuarios
Areas con cultivos agropecuarios + vegetación
Agarrobal ribereño
Areas con escasa y sin vegetación
Areas sin vegetación
Areas con reforestación
Bofedal
Bosque húmedo de colinas altas
Bosque húmedo de colinas altas con pacal
Bosque húmedo de colinas bajas
Bosque húmedo de colinas bajas con pacal
Bosque húmedo de llanura meándrica
Bosque húmedo de lomadas
Bosque húmedo de lomadas con pacal
Bosque húmedo de montaña
Bosque húmedo de montaña con pacal
Bosque húmedo de terrazas altas
Bosque húmedo de terrazas bajas
Bosque húmedo de terrazas bajas con pacal
Bosque húmedo de terrazas medias
Bosque húmedo de terrazas medias - altas
Bosque húmedo de terrazas medias - altas con pacal
Bosque húmedo fraccionado de montañas
Bosque seco raló de lomadas y colinas
Bosque seco raló de montañas
Bosque seco raló de valle interandino
Bosque seco semidenso de colinas
Bosque seco semidenso de montañas
Bosque seco tipo sabana
Bosque subhúmedo denso de fondo de valle
Bosque subhúmedo denso de montañas
Lagos y Lagunas
Lomas
Matorral seco de dunas
Matorral húmedo
Matorral seco
Matorral subhúmedo
Nevados
Pajonal
Pajonal / Césped de puna
Queñoal
Rio Poligono
Sabana hidrofitica
JICA
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
AGRONORT
MAPA FORESTAL
10
Fuentes:
IGN, INEI, MINAG, MTC, GOB. REGIONALES
Fecha: AGOSTO, 2009
0 25 50 100 150 200
Km

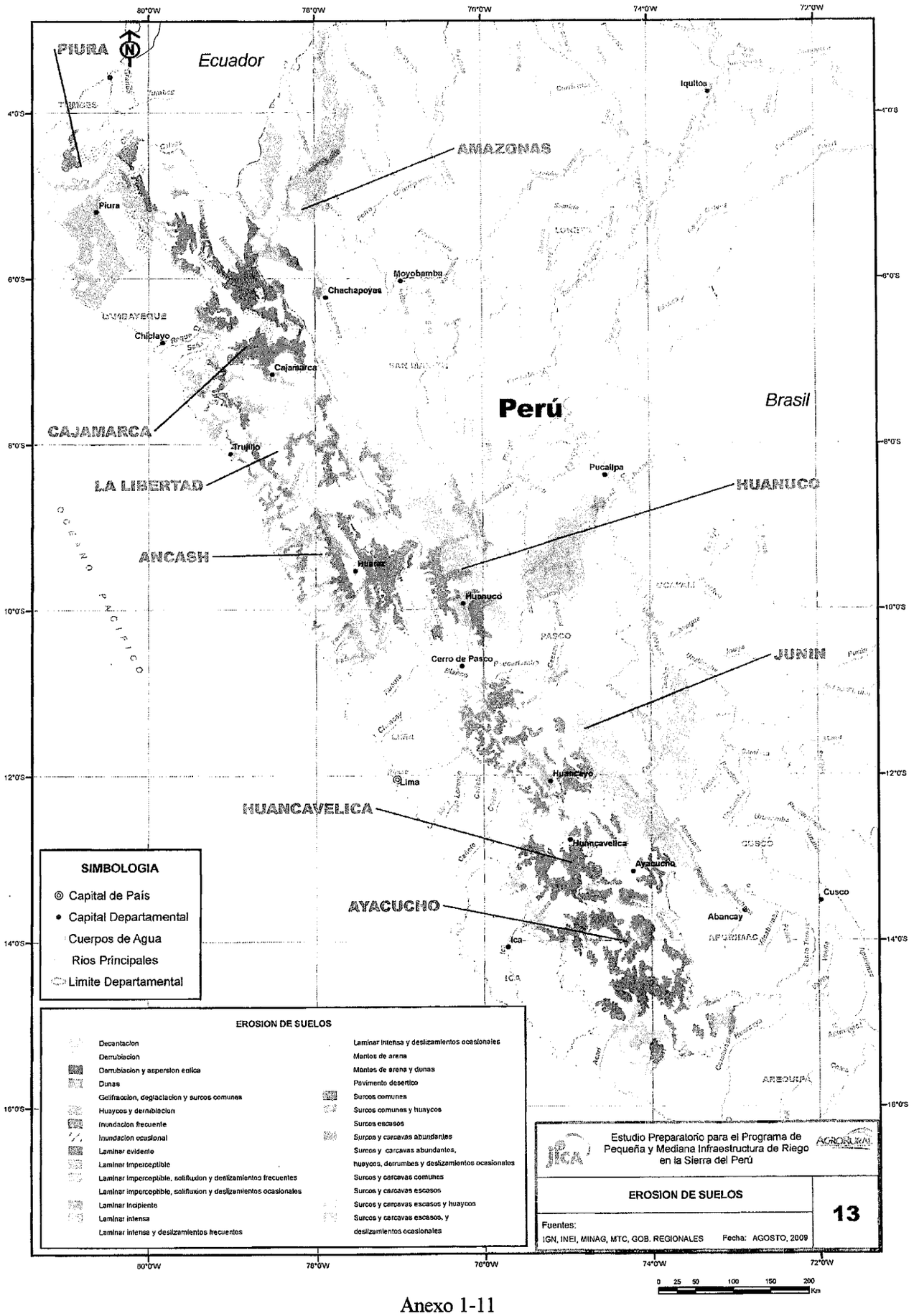
Anexo 1- 8


80°0'W
78°0'W
76°0'W
74°0'W
72°0'W
4°0'S
6°0'S
8°0'S
10°0'S
12°0'S
14°0'S
16°0'S
PIURA
Ecuador
Iquitos
AMAZONAS
Piura
Moyobamba
Chachapoyas
LAMBAYEQUE
Chiclayo
Cajamarca
Perú
Brasil
CAJAMARCA
Trujillo
LA LIBERTAD
Pucallpa
HUANUCO
ANCASH
Huaraz
Huanuco
Cerro de Pasco
JUNIN
Lima
Huancayo
HUANCAVELICA
Huancavelica
Ayacucho
AYACUCHO
Cusco
Abancay
Ica
SIMBOLOGIA
Capital de País
Capital Departamental
Cuerpos de Agua
Rios Principales
Limite Departamental
COBERTURA VEGETAL
Cultivos agropecuarios + Vegetacion secundaria
Cultivos agricolas
Cultivos agropecuarios
Aguajales y pantanos
Bofedal
Bosque humedo de colinas con pacal
Bosque humedo de lomadas y colinas
Bosque humedo de lomadas y colinas con pacal
Bosque humedo de montañas
Bosque humedo de terrazas
Bosque humedo de terrazas con pacal
Bosque seco de lomadas y colinas
Bosque seco de montañas
Bosque seco de valle interandino
Bosque seco tipo sabana
Bosque subhumedo de fondo de valle
Cesped de puna
Herbazal de tundra
Matorrales
Pajonal
Pajonal / Cesped de puna
Pajonal de puna
Planicies costeras y estribaciones andinas sin vegetacion
Quenoal
Tierras altoandinas con escasa y sin vegetacion
Tierras altoandinas sin vegetación
Estuarios y Esteros
Tierras degradadas
Planicies costeras sin vegetación
Reforestacion
Rios
Nevados
Poblados
Lagos y Lagunas
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
COBERTURA VEGETAL
11
Fuentes:
IGN, INEI, MINAG, MTC, GOB. REGIONALES
Fecha: AGOSTO, 2009
0 25 50 100 150 200
Km

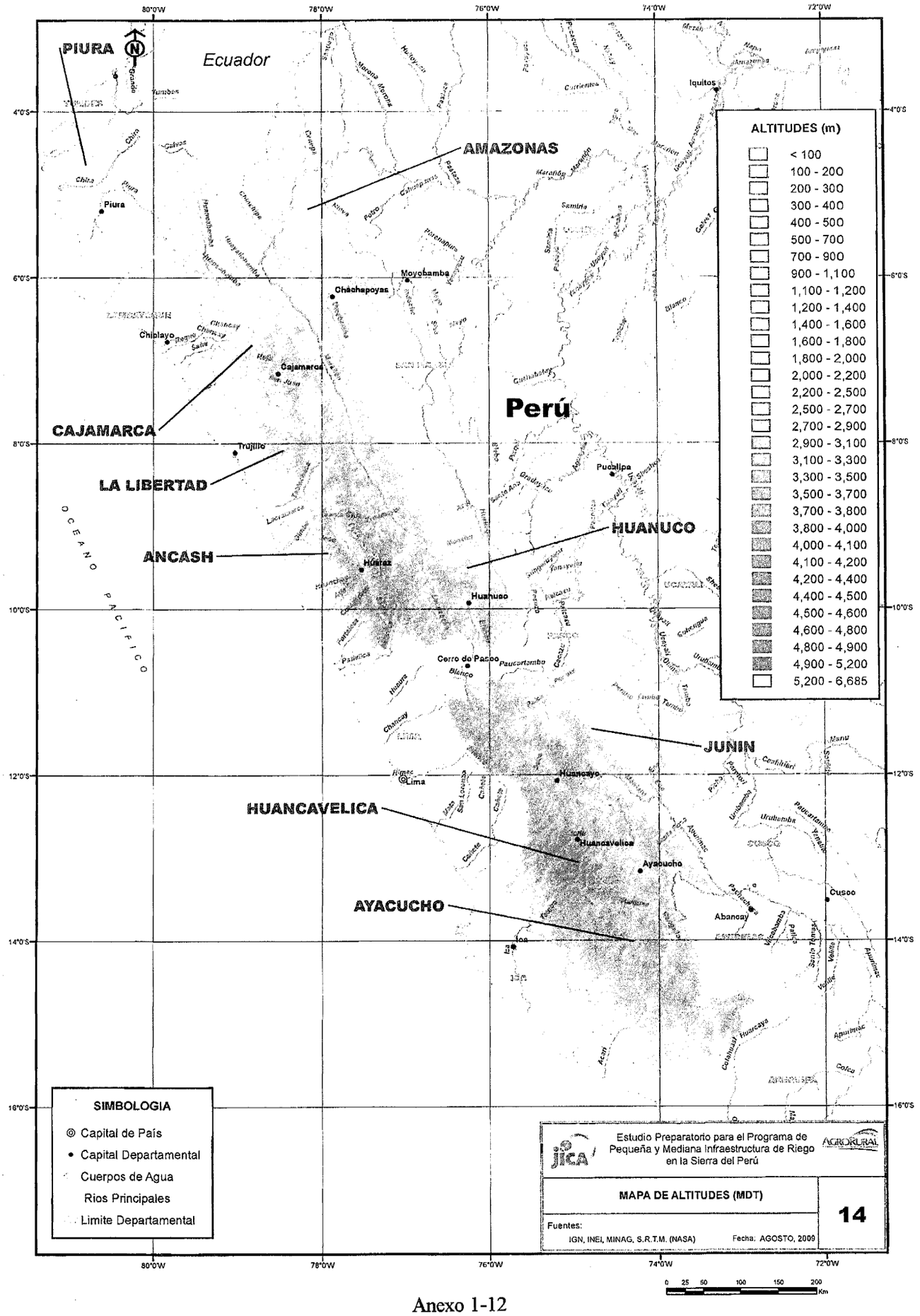
Anexo 1- 9


82°0'W
80°0'W
78°0'W
76°0'W
74°0'W
4°0'S
6°0'S
8°0'S
10°0'S
12°0'S
14°0'S
16°0'S
PIURA
Ecuador
TUMBES
AMAZONAS
Iquitos
Piura
LORETO
Moyobamba
Chachapoyas
LAMBAYEQUE
Chiclayo
Cajamarca
CAJAMARCA
Perú
Trujillo
LA LIBERTAD
Pucallpa
HUANUCO
ANCASH
Huaraz
Huanuco
UCAYALI
PASCO
JUNIN
Cerro de Pasco
HUANCAVELICA
Lima
Huancayo
AYACUCHO
Huancavelica
Ayacucho
CUSCO
Abancay
APURIMAC
Ica
ICA
OCEANO PACIFICO
SIMBOLOGIA
Capital de Pais
Capital Departamental
Cuerpos de Agua
Rios Principales
Limite Departamental
ZONAS DE VIDA
Nival Subtropical
Nival Templado calido
Nival Tropical
bosque espino Subtropical
bosque humedo Montano Bajo Subtropical
bosque humedo Montano Bajo Tropical
bosque humedo Montano Subtropical
bosque humedo Montano Tropical
bosque humedo Premontano Tropical
bosque humedo Premontano Tropical(transicional a bosque humo
bosque humedo Subtropical
bosque humedo Subtropical(transicional a bosque humedo Tropi
bosque humedo Subtrop-cal(transicional a bosque muy humedo S
bosque humedo Subtropical(transicional a bosque pluvial Subt
bosque humedo Tropical
bosque humedo Tropical(transicional a bosque muy humedo Trop
bosque muy humedo Montano Bajo Subtropical
bosque muy humedo Montano Bajo Tropical
bosque muy humedo Montano Tropical
bosque muy humedo Premontano Tropical
bosque muy humedo Premontano Tropical(transicional a bosque
bosque muy humedo Subtropical
bosque muy humedo Tropical
bosque muy seco Tropical
bosque pluvial Montano Bajo Subtropical
bosque pluvial Montano Bajo Tropical
bosque pluvial Montano Subtropical
bosque pluvial Montano Tropical
bosque pluvial Premontano Tropical
bosque pluvial Premontano Tropical(transicional a bosque muy
bosque pluvial Subtropical
bosque pluvial semisaturado Montano Bajo Subtropical
bosque pluvial semisaturado Montano Subtropical
bosque pluvial semisaturado Subtropical
bosque seco Montano Bajo Subtropical
bosque seco Montano Bajo Tropical
bosque seco Premontano Tropical
bosque seco Subtropical
bosque seco Subtropical(transicional a bosque humedo Subtrop
bosque seco Tropical
bosque seco Tropical(transicional a bosque humedo Subtropica
desierto arido Montano Templado calido
desierto arido Montano Tropical
desierto desecado Montano Bajo Subtropical
desierto desecado Premontano Tropical
desierto desecado Subtropical
desierto desecado Templado calido
desierto peraido Montano Bajo Subtropical
desierto peraido Montano Bajo Tropical
desierto peraido Montano Templado calido
desierto peraido Premontano Tropical
desierto perarido Subtropical
desierto perarido Templado calido
desierto semiarido Subalpino Subtropical
desierto superarido Premontano Tropical
desierto superarido Montano Bajo Subtropical
desierto superarido Subtropical
desierto superarido Templado calido
desierto superarido Tropical
desierto arido Montano Subtropical
estepa Montano Tropical
estepa espino Montano Bajo Subtropical
estepa espino Montano Bajo Tropical
matorral desertico Montano Bajo Subtropical
matorral desertico Montano Bajo Tropical
matorral desertico Montano Subtropical
matorral desertico Montano Templado calido
matorral desertico Montano Tropical
matorral desertico Premontano Tropical
matorral desertico Premontano Tropical(transicional a matorr
matorral desertico Subalpino Subtropical
matorral desertico Subalpino Templado calido
matorral desertico Subalpino Tropical
matorral desertico Subtropical
natural desertico Templado calido
matorral desertico Tropical
monte espinoso Premontano Tropical
monte espinoso Premontano Tropical (transicional a monte esp
monte espinoso Tropical
paramo humedo Subalpino Subtropical
paramo humedo Subalpino Tropical
paramo muy humedo Subalpino Subtropical
paramo muy humedo Subalpino Tropical
paramo pluvial Subalpino Subtropical
paramo pluvial Subalpino Tropical
paramo pluvial semisaturado Subalpino Subtropical
tundra humeda Alpino Subtropical
tundra humeda Alpino Templado calido
tundra muy humeda Alpino Subtropical
tundra pluvial Alpino Subtropical
tundra pluvial Alpino Tropical
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
ZONAS DE VIDA
12
Fuentes:
IGN, INEI, MINAG, MTC, GOB. REGIONALES
Fecha: AGOSTO, 2009
0 25 50 100 150 200
Km

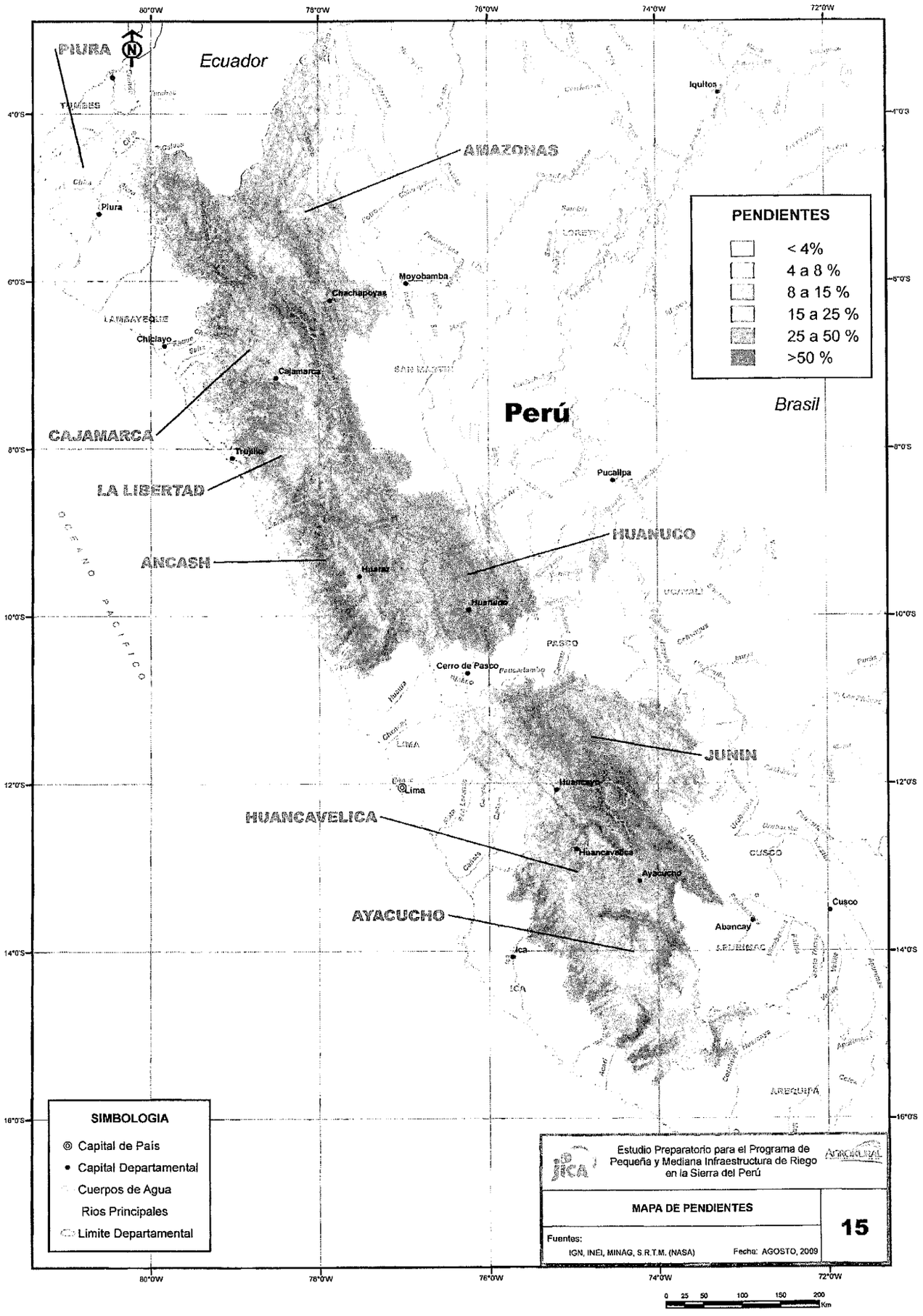
Anexo 1-10


80°0'W
78°0'W
76°0'W
74°0'W
72°0'W
4°0'S
6°0'S
8°0'S
10°0'S
12°0'S
14°0'S
16°0'S
PIURA
Ecuador
AMAZONAS
Iquitos
Piura
Moyobamba
Chachapoyas
LAMBAYEQUE
Chiclayo
Cajamarca
CAJAMARCA
Perú
Brasil
Trujillo
LA LIBERTAD
Pucallpa
HUANUCO
ANCASH
Huaraz
Huanuco
PASCO
Cerro de Pasco
JUNIN
Lima
Huancayo
HUANCAVELICA
Huancavelica
Ayacucho
CUSCO
Cusco
AYACUCHO
Abancay
Ica
APURIMAC
ICA
AREQUIPA
SIMBOLOGIA
Capital de País
Capital Departamental
Cuerpos de Agua
Rios Principales
Limite Departamental
EROSION DE SUELOS
Decantacion
Derrubiacion
Derrubiacion y aspersion eolica
Dunas
Gelifraccion, deglaciacion y surcos comunes
Huaycos y derrubiacion
Inundacion frecuente
Inundacion ocasional
Laminar evidente
Laminar imperceptible
Laminar imperceptible, solifluxion y deslizamientos frecuentes
Laminar imperceptible, solifluxion y deslizamientos ocasionales
Laminar incipiente
Laminar intensa
Laminar intensa y deslizamientos frecuentes
Laminar intensa y deslizamientos ocasionales
Mantos de arena
Mantos de arena y dunas
Pavimento desertico
Surcos comunes
Surcos comunes y huaycos
Surcos escasos
Surcos y carcavas abundantes
Surcos y carcavas abundantes, huaycos, derrumbes y deslizamientos ocasionales
Surcos y carcavas comunes
Surcos y carcavas escasos
Surcos y carcavas escasos y huaycos
Surcos y carcavas escasos, y deslizamientos ocasionales
JICA
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
AGRONUM
EROSION DE SUELOS
13
Fuentes:
IGN, INEI, MINAG, MTC, GOB. REGIONALES
Fecha: AGOSTO, 2009
0 25 50 100 150 200
Km

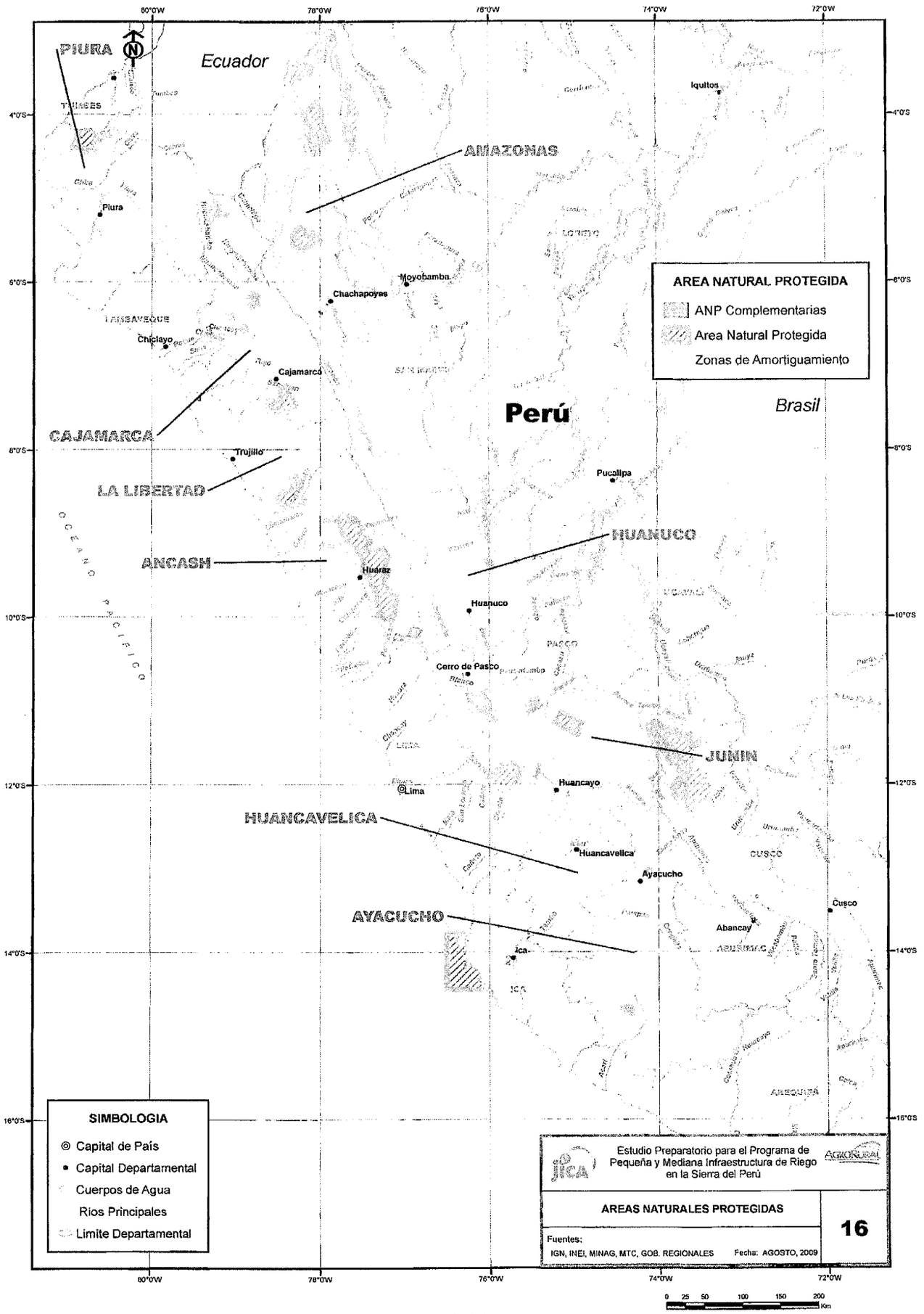
Anexo 1-11


PIURA
Ecuador
AMAZONAS
CAJAMARCA
LA LIBERTAD
ANCASH
HUANUCO
JUNIN
HUANCAVELICA
AYACUCHO
Perú
OCEANO PACIFICO
Piura
Chiclayo
Cajamarca
Trujillo
Chachapoyas
Moyobamba
Iquitos
Pucallpa
Huaraz
Huanuso
Cerro de Pasco
Huancayo
Huancavelica
Ayacucho
Cusco
Abancay
Ica
Lima
ALTITUDES (m)
< 100
100 - 200
200 - 300
300 - 400
400 - 500
500 - 700
700 - 900
900 - 1,100
1,100 - 1,200
1,200 - 1,400
1,400 - 1,600
1,600 - 1,800
1,800 - 2,000
2,000 - 2,200
2,200 - 2,500
2,500 - 2,700
2,700 - 2,900
2,900 - 3,100
3,100 - 3,300
3,300 - 3,500
3,500 - 3,700
3,700 - 3,800
3,800 - 4,000
4,000 - 4,100
4,100 - 4,200
4,200 - 4,400
4,400 - 4,500
4,500 - 4,600
4,600 - 4,800
4,800 - 4,900
4,900 - 5,200
5,200 - 6,685
SIMBOLOGIA
Capital de País
Capital Departamental
Cuerpos de Agua
Rios Principales
Limite Departamental
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
MAPA DE ALTITUDES (MDT)
14
Fuentes:
IGN, INEI, MINAG, S.R.T.M. (NASA)
Fecha: AGOSTO, 2009
80°0'W
78°0'W
76°0'W
74°0'W
72°0'W
4°0'S
6°0'S
8°0'S
10°0'S
12°0'S
14°0'S
16°0'S
0 25 50 100 150 200
Km

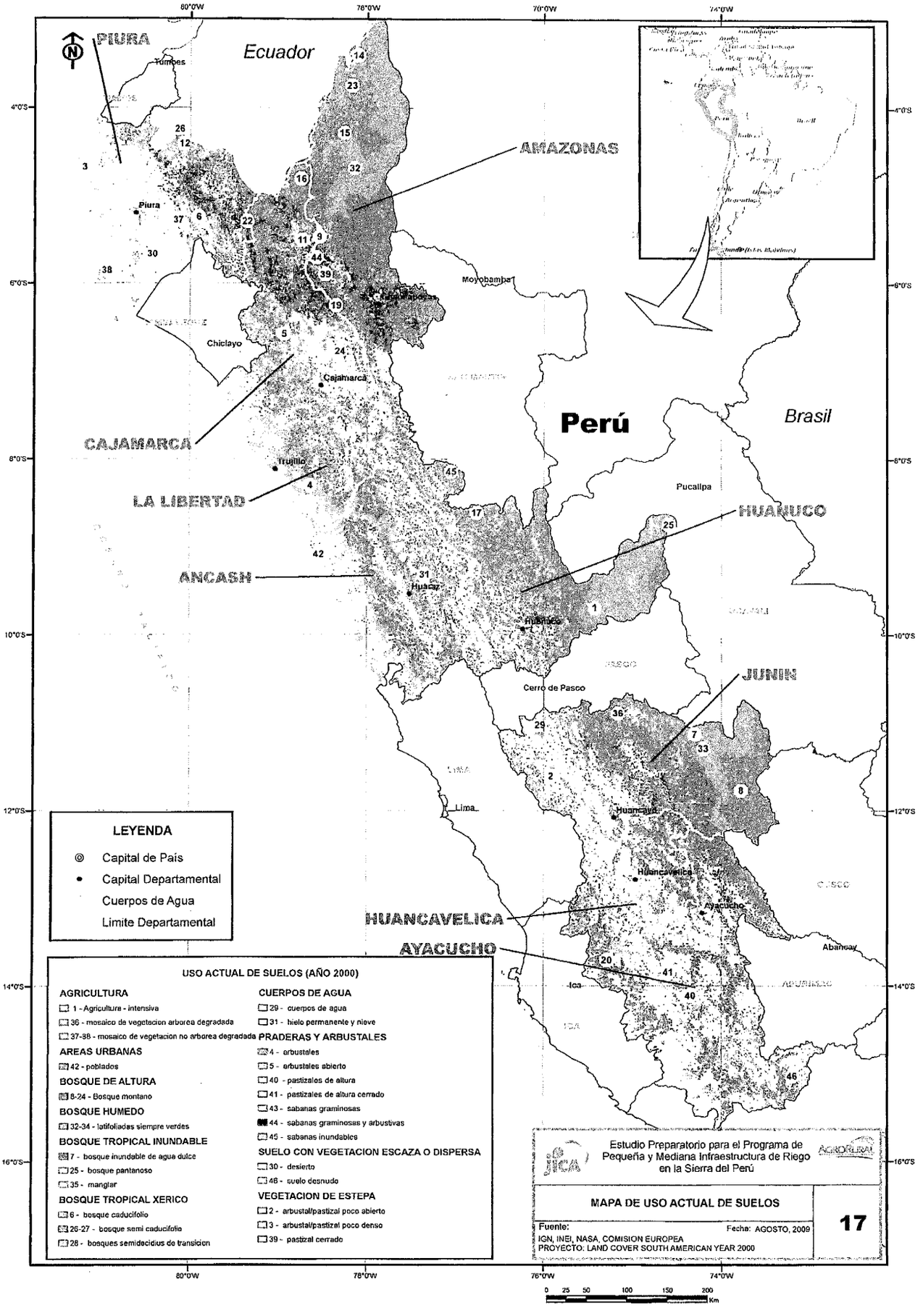
Anexo 1-12


PIURA
Ecuador
TUMBES
AMAZONAS
Iquitos
Piura
Moyobamba
Chachapoyas
LAMBAYEQUE
Chiclayo
Cajamarca
SAN MARTIN
Perú
Brasil
CAJAMARCA
Trujillo
LA LIBERTAD
Pucallpa
HUANUCO
ANCASH
Huaraz
Huanuco
OCEANO PACIFICO
PASCO
Cerro de Pasco
LIMA
JUNIN
Lima
Huancayo
HUANCAVELICA
Huancavelica
CUSCO
Ayacucho
Cusco
AYACUCHO
Abancay
APURIMAC
Ica
ICA
AREQUIPA
PENDIENTES
< 4%
4 a 8 %
8 a 15 %
15 a 25 %
25 a 50 %
>50 %
SIMBOLOGIA
Capital de País
Capital Departamental
Cuerpos de Agua
Rios Principales
Limite Departamental
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
MAPA DE PENDIENTES
15
Fuentes:
IGN, INEI, MINAG, S.R.T.M. (NASA)
Fecha: AGOSTO, 2009
80°0'W
78°0'W
76°0'W
74°0'W
72°0'W
4°0'S
6°0'S
8°0'S
10°0'S
12°0'S
14°0'S
16°0'S
0 25 50 100 150 200
Km

Anexo 1-13

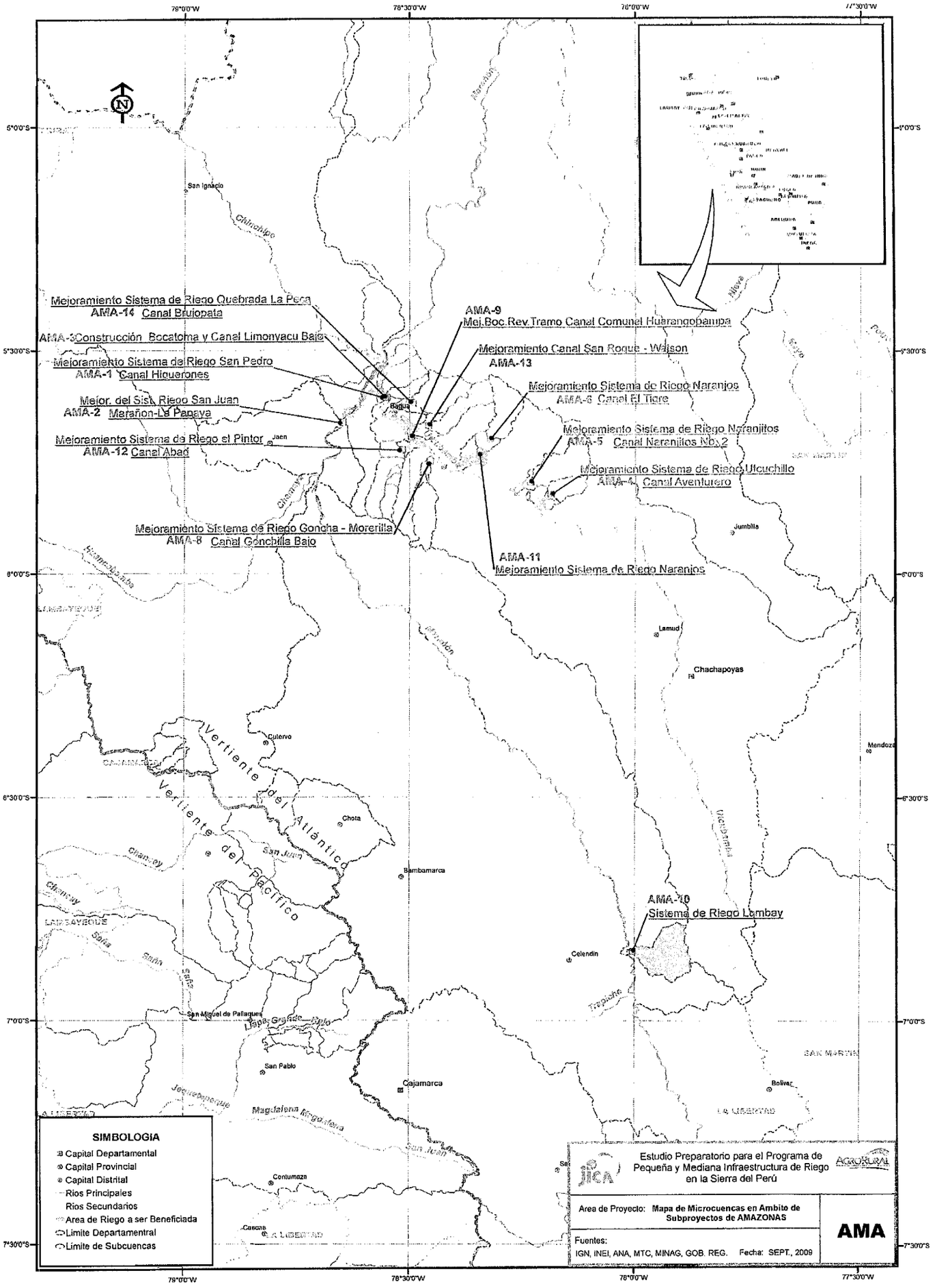

80°0'W
78°0'W
76°0'W
74°0'W
72°0'W
4°0'S
6°0'S
8°0'S
10°0'S
12°0'S
14°0'S
16°0'S
PIURA
Ecuador
AMAZONAS
CAJAMARCA
LA LIBERTAD
ANCASH
HUANUCO
JUNIN
HUANCAVELICA
AYACUCHO
Perú
Brasil
Iquitos
Piura
Moyobamba
Chachapoyas
Chiclayo
Cajamarca
Trujillo
Pucallpa
Huaraz
Huanuco
Cerro de Pasco
Lima
Huancayo
Huancavelica
Ayacucho
Cusco
Abancay
Ica
AREA NATURAL PROTEGIDA
ANP Complementarias
Area Natural Protegida
Zonas de Amortiguamiento
SIMBOLOGIA
Capital de País
Capital Departamental
Cuerpos de Agua
Rios Principales
Limite Departamental
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
AREAS NATURALES PROTEGIDAS
16
Fuentes:
IGN, INEI, MINAG, MTC, GOB. REGIONALES
Fecha: AGOSTO, 2009
0 25 50 100 150 200
Km

Anexo 1-14

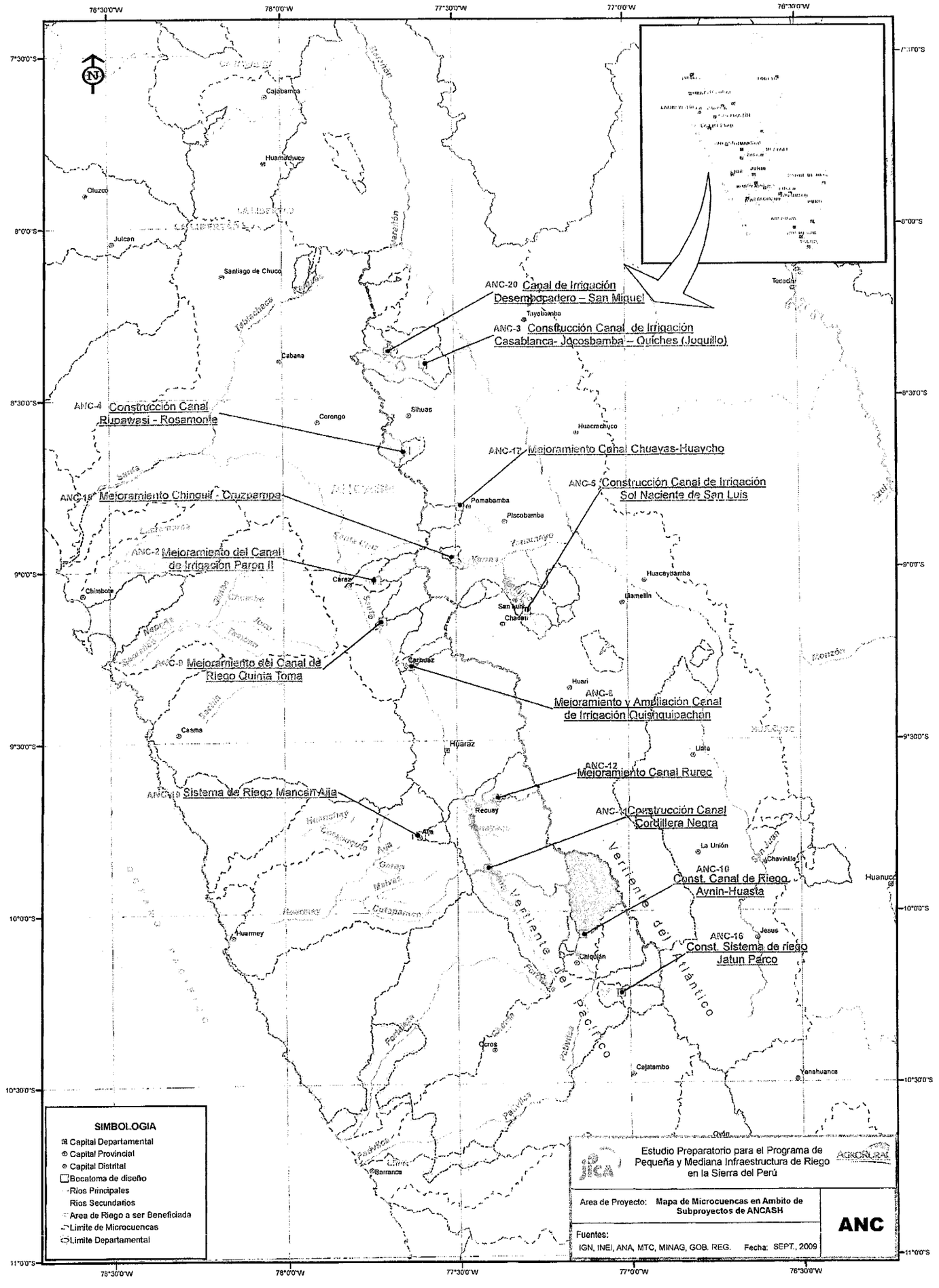

80°0'W
76°0'W
70°0'W
74°0'W
4°0'S
6°0'S
8°0'S
10°0'S
12°0'S
14°0'S
16°0'S
PIURA
Ecuador
Tumbes
AMAZONAS
Piura
Moyobamba
Chiclayo
Cajamarca
CAJAMARCA
Perú
Brasil
Trujillo
LA LIBERTAD
Pucallpa
HUANUCO
ANCASH
Huaraz
Huanuco
JUNIN
Cerro de Pasco
Lima
Huancayo
Huancavelica
HUANCAVELICA
Ayacucho
AYACUCHO
Abancay
Ica
LEYENDA
Capital de Pais
Capital Departamental
Cuerpos de Agua
Limite Departamental
USO ACTUAL DE SUELOS (AÑO 2000)
AGRICULTURA
1 - Agricultura - intensiva
36 - mosaico de vegetacion arborea degradada
37-38 - mosaico de vegetacion no arborea degradada
AREAS URBANAS
42 - poblados
BOSQUE DE ALTURA
8-24 - Bosque montano
BOSQUE HUMEDO
32-34 - latifoliadas siempre verdes
BOSQUE TROPICAL INUNDABLE
7 - bosque inundable de agua dulce
25 - bosque pantanoso
35 - manglar
BOSQUE TROPICAL XERICO
6 - bosque caducifolio
26-27 - bosque semi caducifolio
28 - bosques semideciduos de transicion
CUERPOS DE AGUA
29 - cuerpos de agua
31 - hielo permanente y nieve
PRADERAS Y ARBUSTALES
4 - arbustales
5 - arbustales abierto
40 - pastizales de altura
41 - pastizales de altura cerrado
43 - sabanas graminosas
44 - sabanas graminosas y arbustivas
45 - sabanas inundables
SUELO CON VEGETACION ESCAZA O DISPERSA
30 - desierto
46 - suelo desnudo
VEGETACION DE ESTEPA
2 - arbustal/pastizal poco abierto
3 - arbustal/pastizal poco denso
39 - pastizal cerrado
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
MAPA DE USO ACTUAL DE SUELOS
17
Fuente:
IGN, INEI, NASA, COMISION EUROPEA
PROYECTO: LAND COVER SOUTH AMERICAN YEAR 2000
Fecha: AGOSTO, 2009
0 25 50 100 150 200
Km

Anexo 1-15

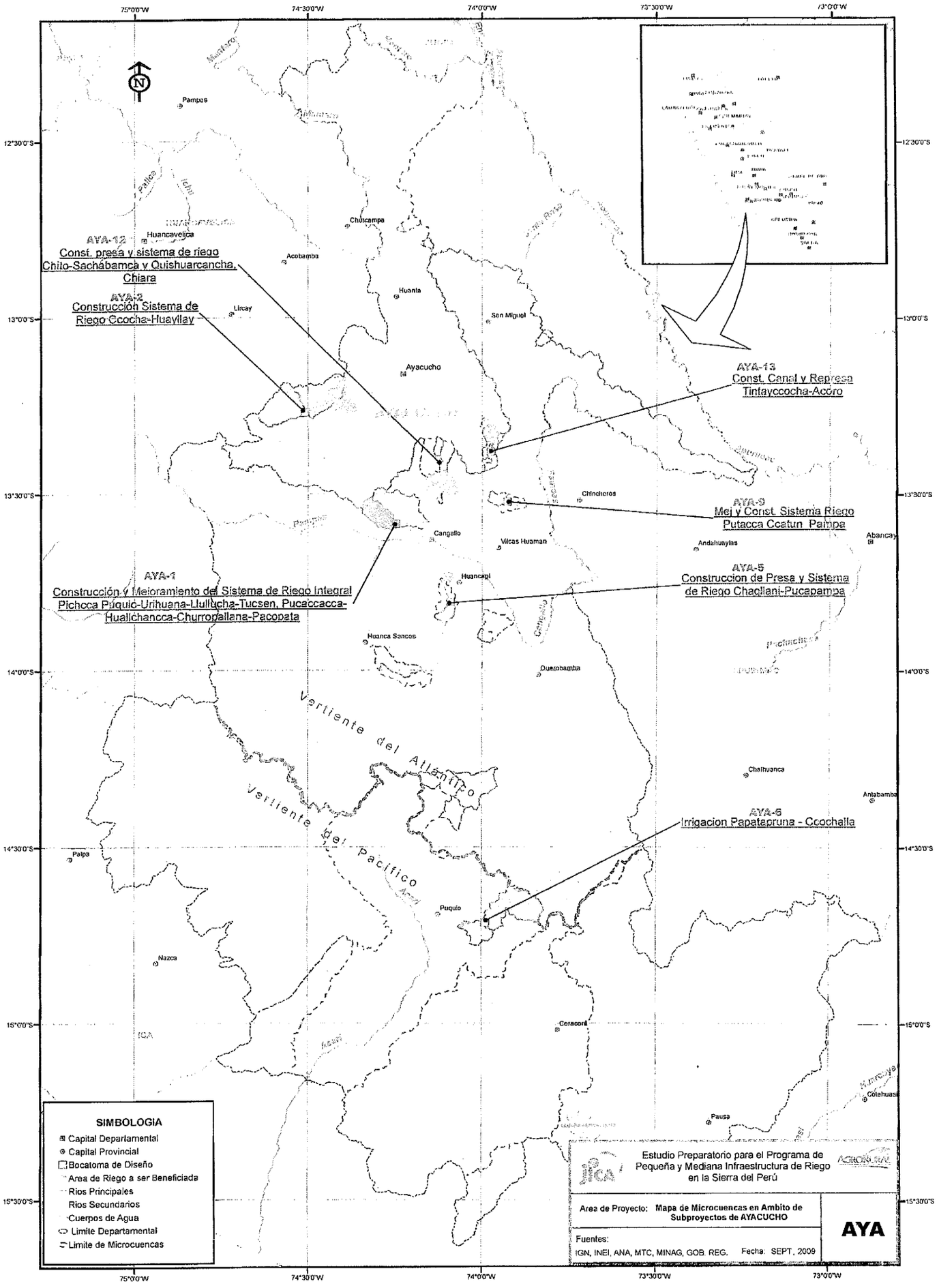
2. CUENCAS HIDROGRAFICAS EN EL AMBITO DE SUBPROYECTO


Mejoramiento Sistema de Riego Quebrada La Peca
AMA-14 Canal Brujopata
AMA-3 Construcción Bocatoma y Canal Limonyacu Bajo
Mejoramiento Sistema de Riego San Pedro
AMA-1 Canal Higuerones
Mejor. del Sist. Riego San Juan
AMA-2 Marañon-La Panaya
Mejoramiento Sistema de Riego el Pintor
AMA-12 Canal Abad
Mejoramiento Sistema de Riego Concha - Morerilla
AMA-8 Canal Conchilla Bajo
AMA-9
Mej.Boc.Rev.Tramo Canal Comunel Huarangobamba
Mejoramiento Canal San Roque - Walson
AMA-13
Mejoramiento Sistema de Riego Naranjos
AMA-6 Canal El Tigre
Mejoramiento Sistema de Riego Naranjitos
AMA-5 Canal Naranjitos No.2
Mejoramiento Sistema de Riego Ucuchillo
AMA-4 Canal Aventurero
AMA-11
Mejoramiento Sistema de Riego Naranjos
AMA-10
Sistema de Riego Lambay
San Ignacio
Bagua
Jaen
Jumbilla
Lamud
Chachapoyas
Mendoza
Cutervo
Chota
Bambamarca
Celendin
San Miguel de Pallaques
San Pablo
Cajamarca
Bolivar
Contumaza
Cascas
Vertiente del Atlántico
Vertiente del Pacífico
SIMBOLOGIA
Capital Departamental
Capital Provincial
Capital Distrital
Rios Principales
Rios Secundarios
Area de Riego a ser Beneficiada
Limite Departamentral
Limite de Subcuencas
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
Area de Proyecto: Mapa de Microcuencas en Ambito de Subproyectos de AMAZONAS
Fuentes:
IGN, INEI, ANA, MTC, MINAG, GOB. REG. Fecha: SEPT., 2009
AMA

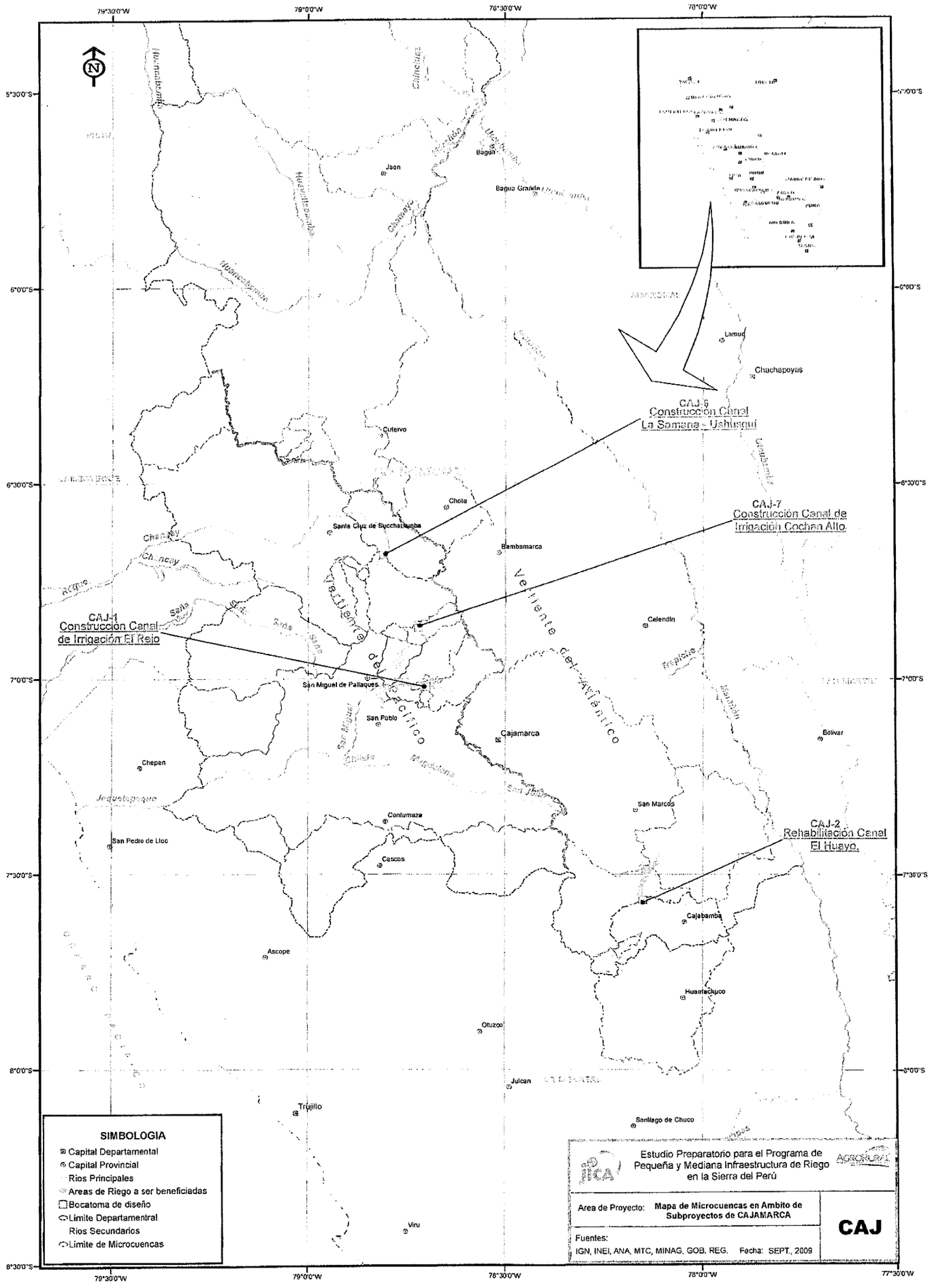
Anexo 2- 1


ANC-20 Canal de Irrigación Desembocadero – San Miguel
ANC-3 Construcción Canal de Irrigación Casablanca- Jocosbamba – Quiches (Joquillo)
ANC-4 Construcción Canal Rupawasi - Rosamonte
ANC-17 Mejoramiento Canal Chuayas-Huaycho
ANC-18 Mejoramiento Chinquil - Cruzpampa
ANC-5 Construcción Canal de Irrigación Sol Naciente de San Luis
ANC-2 Mejoramiento del Canal de Irrigación Paron II
ANC-9 Mejoramiento del Canal de Riego Quinta Toma
ANC-6 Mejoramiento y Ampliación Canal de Irrigación Quishquipachan
ANC-12 Mejoramiento Canal Rurec
ANC-13 Sistema de Riego Mancen Aija
ANC-11 Construcción Canal Cordillera Negra
ANC-10 Const. Canal de Riego Aynin-Huasta
ANC-16 Const. Sistema de riego Jatun Parco
Vertiente del Atlantico
Vertiente del pacifico
SIMBOLOGIA
Capital Departamental
Capital Provincial
Capital Distrital
Bocatoma de diseño
Rios Principales
Rios Secundarios
Area de Riego a ser Beneficiada
Limite de Microcuencas
Limite Departamental
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
Area de Proyecto: Mapa de Microcuencas en Ambito de Subproyectos de ANCASH
ANC
Fuentes:
IGN, INEI, ANA, MTC, MINAG, GOB. REG. Fecha: SEPT., 2009

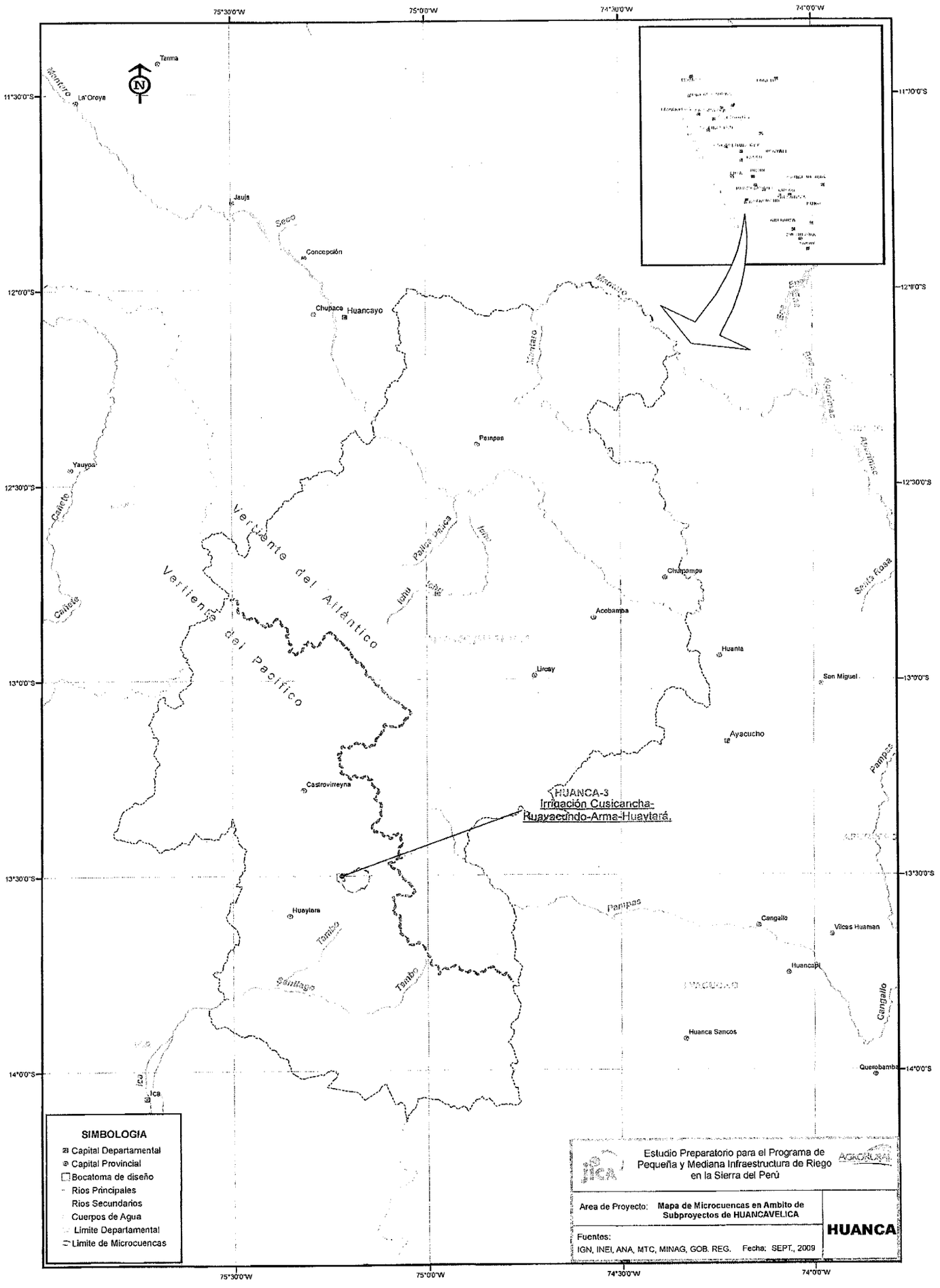
Anexo 2- 2


AYA-12
Const. presa y sistema de riego Chilo-Sachábamca y Quishuarcancha, Chiara
AYA-2
Construcción Sistema de Riego Ccocha-Huaylay
AYA-13
Const. Canal y Represa Tinfayccocha-Acóro
AYA-9
Mej y Const. Sistema Riego Putacca Ccatun Pampa
AYA-5
Construccion de Presa y Sistema de Riego Chacllani-Pucapampa
AYA-1
Construcción y Mejoramiento del Sistema de Riego Integral Pichcca Púquio-Urihuana-Llullucha-Tucsen, Pucaccacca-Huallchancca-Churropallana-Pacopata
AYA-6
Irrigacion Papatépruna - Ccochalla
Vertiente del Atlántico
Vertiente del Pacífico
Pampas
Huancavelica
Chuicampa
Acobamba
Huanta
San Miguel
Ayacucho
Chincheros
Cangallo
Vilcas Huaman
Andahuaylas
Abancay
Huancapi
Huanca Sancos
Querobamba
Chalhuanca
Antabamba
Palpa
Puquio
Nazca
Coracora
Cotahuasi
Pausa
75°0'0"W
74°30'0"W
74°0'0"W
73°30'0"W
73°0'0"W
12°30'0"S
13°0'0"S
13°30'0"S
14°0'0"S
14°30'0"S
15°0'0"S
15°30'0"S
SIMBOLOGIA
Capital Departamental
Capital Provincial
Bocatoma de Diseño
Area de Riego a ser Beneficiada
Rios Principales
Rios Secundarios
Cuerpos de Agua
Limite Departamental
Limite de Microcuencas
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
Area de Proyecto: Mapa de Microcuencas en Ambito de Subproyectos de AYACUCHO
AYA
Fuentes:
IGN, INEI, ANA, MTC, MINAG, GOB. REG.
Fecha: SEPT, 2009

Anexo 2- 3


CAJ-6
Construcción Canal
La Samana - Ushuqui
CAJ-7
Construcción Canal de
Irrigación Cochan Alto.
CAJ-1
Construcción Canal
de Irrigación El Reio
CAJ-2
Rehabilitación Canal
El Huayo.
Jaen
Bagua
Bagua Grande
Lamud
Chachapoyas
Cutervo
Chota
Santa Cruz de Succhabamba
Bambamarca
Celendin
San Miguel de Pallaques
San Pablo
Cajamarca
Bolivar
Chepen
San Marcos
Contumaza
San Pedro de Lloc
Cascas
Cajabamba
Ascope
Huamachuco
Otuzco
Julcan
Trujillo
Santiago de Chuco
Viru
Vertiente del Pacífico
Vertiente del Atlántico
SIMBOLOGIA
Capital Departamental
Capital Provincial
Rios Principales
Areas de Riego a ser beneficiadas
Bocatoma de diseño
Limite Departamentral
Rios Secundarios
Limite de Microcuencas
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
Area de Proyecto: Mapa de Microcuencas en Ambito de Subproyectos de CAJAMARCA
CAJ
Fuentes:
IGN, INEI, ANA, MTC, MINAG, GOB. REG. Fecha: SEPT., 2009

Anexo 2- 4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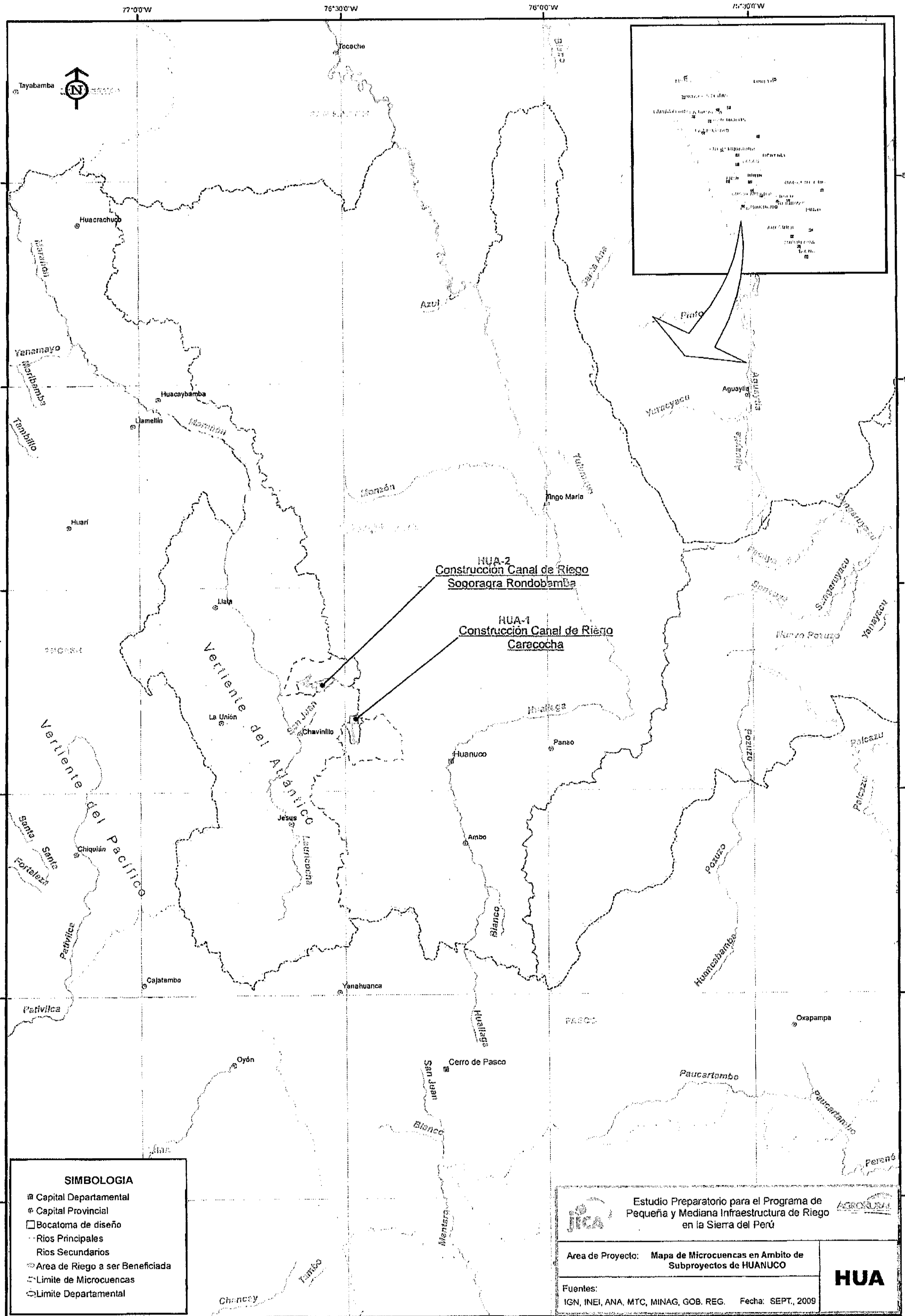
13°30'0"S
14°0'0"S
Tarma
La Oroya
Jauja
Concepción
Chupaca
Huancayo
Pampas
Yauyos
Chumpimpu
Acobamba
Huanta
Lircay
San Miguel
Ayacucho
Castrovirreyna
Huaytara
Cangallo
Vilcas Huaman
Huancapi
Huanca Sancos
Querobamba
Ica
Vertiente del Atlántico
Vertiente del Pacífico
HUANCA-3
Irrigación Cusicancha-
Ruayacundo-Arma-Huaytará.
SIMBOLOGIA
Capital Departamental
Capital Provincial
Bocatoma de diseño
Rios Principales
Rios Secundarios
Cuerpos de Agua
Limite Departamental
Limite de Microcuencas
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
AGRORURAL
Area de Proyecto: Mapa de Microcuencas en Ambito de Subproyectos de HUANCAVELICA
HUANCA
Fuentes:
IGN, INEI, ANA, MTC, MINAG, GOB. REG. Fecha: SEPT., 2009

Anexo 2- 5



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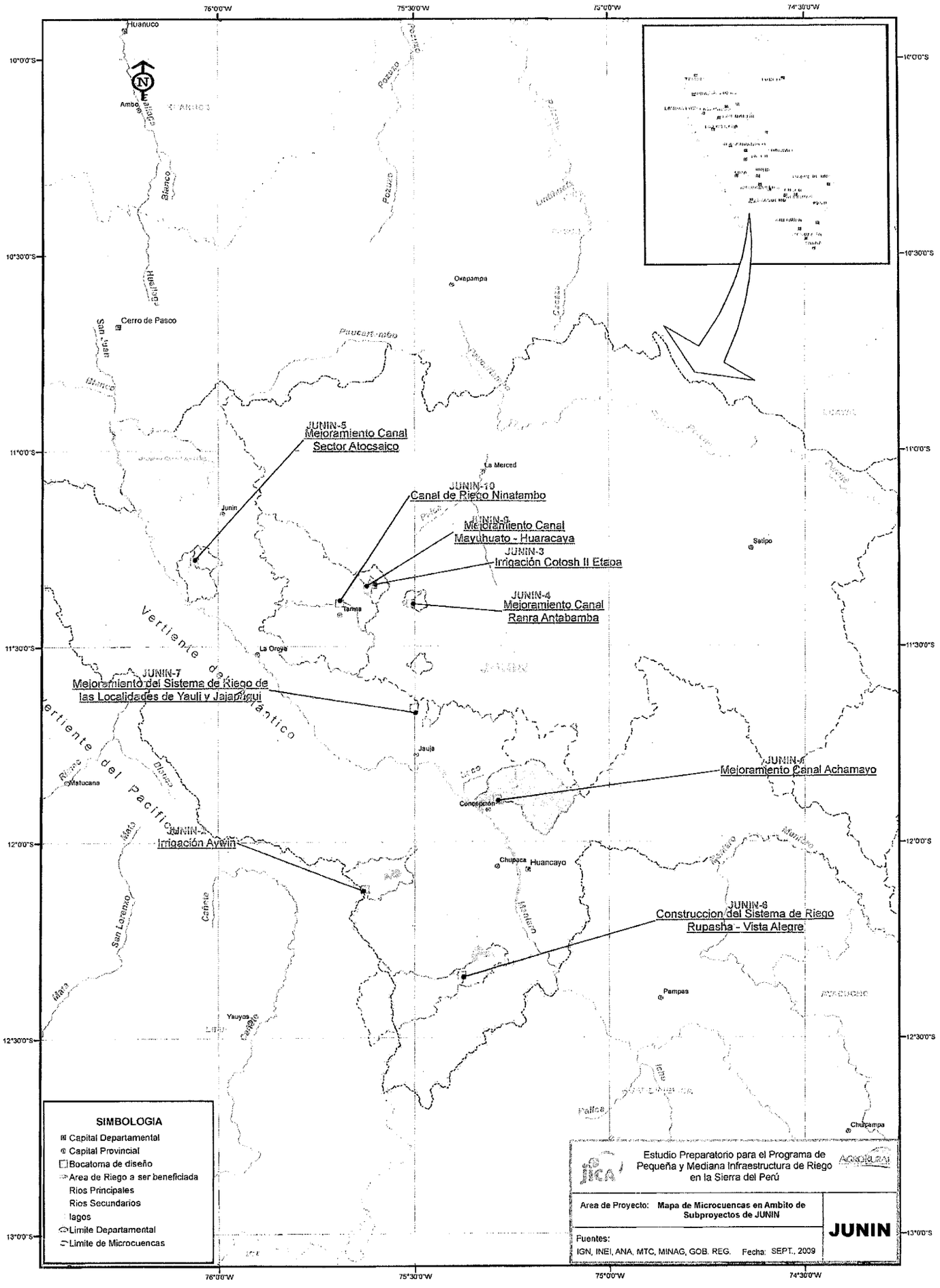
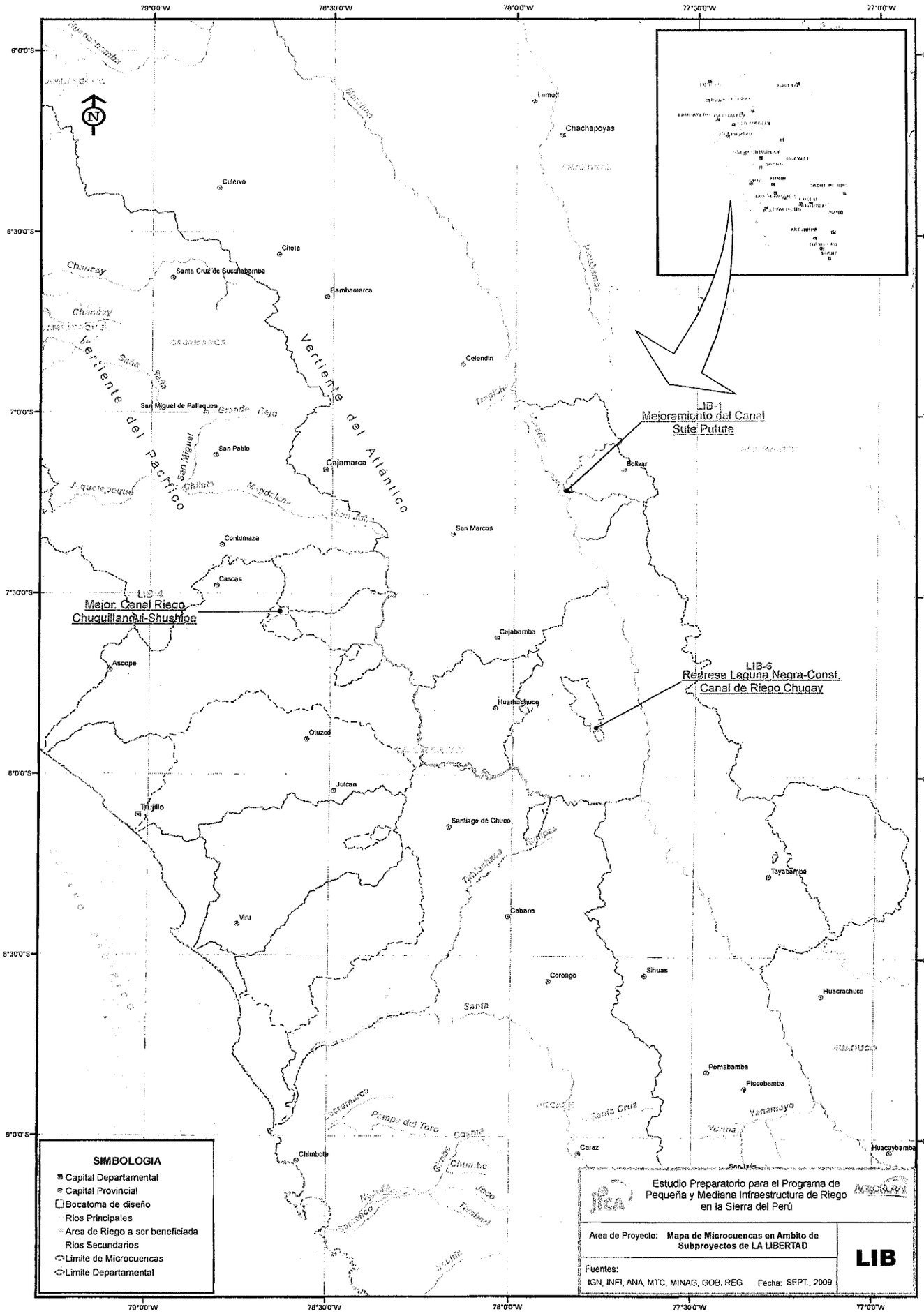
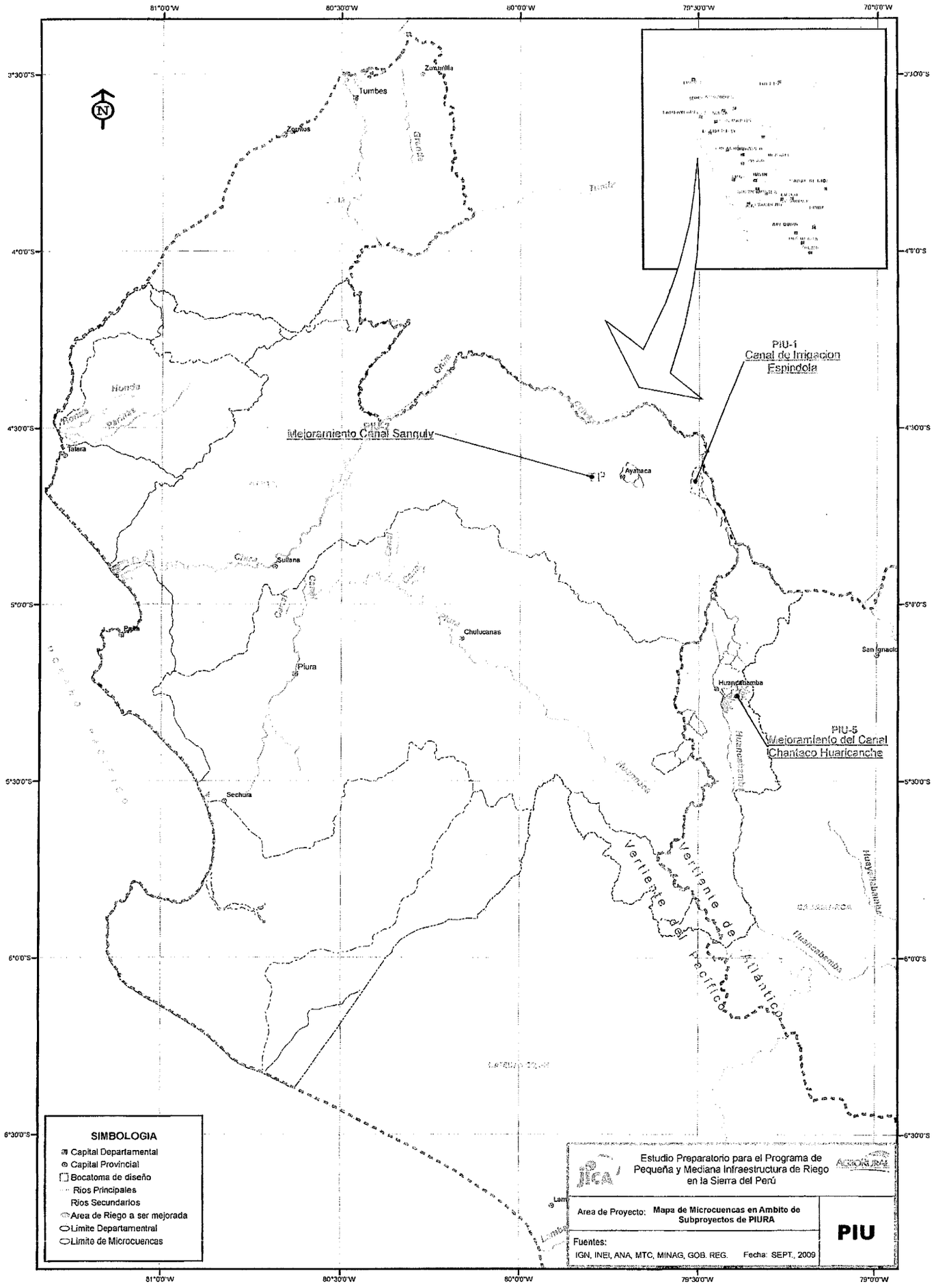
9°0'0"S
9°30'0"S
10°0'0"S
10°30'0"S
11°0'0"S
Tocache
Tayabamba
Huacrachuco
Azul
Santa Ana
Pinto
Yanamayo
Huacaybamba
Llamellín
Marañón
Aguaytía
Yuracyacu
Monzón
Tingo María
Huarí
HUA-2
Construcción Canal de Riego
Sogoragra Rondobamba
HUA-1
Construcción Canal de Riego
Caracocha
Llata
Vertiente del Atlántico
Vertiente del Pacífico
La Unión
San Juan
Chavinillo
Huallaga
Panao
Huanuco
Pozuzo
Jesus
Lauricocha
Ambo
Chiquián
Santa
Fortaleza
Pativilca
Blanco
Huancabamba
Cajatambo
Yanahuanca
Oxapampa
PASCO
Oyón
Cerro de Pasco
San Juan
Paucartambo
Mantaro
Perené
Chancay
SIMBOLOGIA
Capital Departamental
Capital Provincial
Bocatoma de diseño
Rios Principales
Rios Secundarios
Area de Riego a ser Beneficiada
Limite de Microcuencas
Limite Departamental
Estudio Preparatorio para el Programa de
Pequeña y Mediana Infraestructura de Riego
en la Sierra del Perú
Area de Proyecto:
Mapa de Microcuencas en Ambito de
Subproyectos de HUANUCO
HUA
Fuentes:
IGN, INEI, ANA, MTC, MINAG, GOB. REG.
Fecha: SEPT., 2009


JUNIN-5
Mejoramiento Canal
Sector Atocsaico
JUNIN-10
Canal de Riego Ninatambo
JUNIN-9
Mejoramiento Canal
Mayuhuato - Huaracaya
JUNIN-3
Irrigación Cotosh II Etapa
JUNIN-4
Mejoramiento Canal
Ranra Antabamba
JUNIN-7
Mejoramiento del Sistema de Riego de
las Localidades de Yauli y Jajamiqui
JUNIN-1
Irrigación Ayevin
JUNIN-6
Mejoramiento Canal Achamayo
JUNIN-8
Construccion del Sistema de Riego
Rupasha - Vista Alegre
Huanuco
Cerro de Pasco
Oxapampa
La Merced
Junin
Tarma
La Oroya
Jauja
Satipo
Concepcion
Chupaca
Huancayo
Pampas
Chupampa
Vertiente del Atlántico
Vertiente del Pacífico
SIMBOLOGIA
Capital Departamental
Capital Provincial
Bocatoma de diseño
Area de Riego a ser beneficiada
Rios Principales
Rios Secundarios
lagos
Limite Departamental
Limite de Microcuencas
Estudio Preparatorio para el Programa de
Pequeña y Mediana Infraestructura de Riego
en la Sierra del Perú
Area de Proyecto: Mapa de Microcuencas en Ambito de Subproyectos de JUNIN
JUNIN
Fuentes:
IGN, INEI, ANA, MTC, MINAG, GOB. REG. Fecha: SEPT., 2009

Anexo 2- 7


LIB-1
Mejoramiento del Canal
Sute Pututo
LIB-4
Mejor. Canal Riego
Chuquillanqui-Shushipe
LIB-6
Represa Laguna Negra-Const.
Canal de Riego Chugay
Vertiente del Pacífico
Vertiente del Atlántico
Chachapoyas
Cutervo
Chota
Santa Cruz de Succhabamba
Bambamarca
Celendin
San Miguel de Pallaques
San Pablo
Cajamarca
Bolivar
San Marcos
Contumaza
Cascas
Cajabamba
Ascope
Huamachuco
Otuzco
Julcan
Trujillo
Santiago de Chuco
Tayabamba
Viru
Cabana
Corongo
Sihuas
Huacrachuco
Pomabamba
Piscobamba
Caraz
Huacaybamba
Chimbote
SIMBOLOGIA
Capital Departamental
Capital Provincial
Bocatoma de diseño
Rios Principales
Area de Riego a ser beneficiada
Rios Secundarios
Limite de Microcuencas
Limite Departamental
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
Area de Proyecto: Mapa de Microcuencas en Ambito de Subproyectos de LA LIBERTAD
LIB
Fuentes:
IGN, INEI, ANA, MTC, MINAG, GOB. REG. Fecha: SEPT., 2009

Anexo 2- 8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80°30'0"W
80°0'0"W
79°30'0"W
79°0'0"W
3°30'0"S
4°0'0"S
4°30'0"S
5°0'0"S
5°30'0"S
6°0'0"S
6°30'0"S
Zorritos
Tumbes
Zarumilla
Talara
Paita
Sullana
Piura
Chulucanas
Sechura
Ayahaca
Huancabamba
San Ignacio
PIU-1
Canal de Irrigacion
Espindola
Mejoramiento Canal Sanguy
PIU-5
Mejoramiento del Canal
Chantaco Huaricanche
Vertiente del Pacífico
Vertiente del Atlántico
SIMBOLOGIA
Capital Departamental
Capital Provincial
Bocatoma de diseño
Rios Principales
Rios Secundarios
Area de Riego a ser mejorada
Limite Departamentral
Limite de Microcuencas
Estudio Preparatorio para el Programa de Pequeña y Mediana Infraestructura de Riego en la Sierra del Perú
Area de Proyecto: Mapa de Microcuencas en Ambito de Subproyectos de PIURA
PIU
Fuentes:
IGN, INEI, ANA, MTC, MINAG, GOB. REG. Fecha: SEPT., 2009

Anexo 2- 9

3. COSTO DE PROGRAMA

COSTO DE INVERSION DEL PROGRAMA A COSTOS PRIVADOS S/.

	actividad	UNIDAD	CANTIDAD	TOTAL	DISTRIBUCION DE LA INVERSION (S/.) AÑO 1	AÑO 2	AÑO 3	AÑO 4	AÑO 5	TOTAL
	COMPONENTE A INFRAESTRUCTURA DE RIEGO			**174,484,702.09**	**2,177,963.00**	**46,280,432.14**	**50,856,423.84**	**49,404,445.99**	**25,765,437.13**	**174,484,702.09**
I	**EXPEDIENTE TECNICO Y ESTUDIOS**	**UNID**	**56**	2,177,963.00	2,177,963.00	0.00	0.00	0.00	0.00	2,177,963.00
II	**INFRAESTRUCTURA**			**154,055,290.45**	**0.00**	**46,216,587.14**	**46,216,587.14**	**38,513,822.61**	**23,108,293.57**	**154,055,290.45**
	OBRA DE RIEGO	**UNID**	**56**	133,189,041.54		39,956,712.46	39,956,712.46	33,297,260.39	19,978,356.23	133,189,041.54
	MEDIO AMBIENTE	**UNID**	**56**	382,563.76		114,769.13	114,769.13	95,640.94	57,384.56	382,563.76
	GASTOS GENERALES	**UNID**	**56**	6,719,923.55		2,015,977.07	2,015,977.07	1,679,980.89	1,007,988.53	6,719,923.55
	GASTOS DE SUPERVISION	**UNID**	**56**	13,763,761.60		4,129,128.48	4,129,128.48	3,440,940.40	2,064,564.24	13,763,761.60
III	**CAPACITACION**			**2,622,405.38**	**0.00**	**63,845.00**	**767,568.11**	**1,279,280.19**	**511,712.08**	**2,622,405.38**
	CONFORMACION DE COMITÉ DE REGANTES	**UNID**	**56**	63,845.00		63,845.00				63,845.00
	CAPACITACION EN MANEJO DEL AGUA O&M Y RIEGO PARCELARIO	**UNID**	**56**	421,594.78			126,478.43	210,797.39	84,318.96	421,594.78
	PROMOCION DE RIEGO TECNIFICADO	**UNID**	**56**	2,136,965.60			641,089.68	1,068,482.80	427,393.12	2,136,965.60
IV	**FOMENTO DE LA ASOCIATIVIDAD PARA LA PRODUCTIVIDAD**			**3,324,071.28**	**0.00**	**0.00**	**1,095,711.28**	**2,228,360.00**	**0.00**	**3,324,071.28**
	PRODUCTORES ORGANIZADOS Y FORMALIZADOS	**UNID**	**56**	892,311.28			892,311.28			892,311.28
	ESTUDIO DE MERCADO Y CADENA PRODUCTIVA	**UNID**	**56**	2,024,960.00				2,024,960.00		2,024,960.00
	SUPERVISOR	**UNID**	**56**	406,800.00			203,400.00	203,400.00		406,800.00
V	**ASISTENCIA**			**9,149,342.86**	**0.00**	**0.00**	**1,829,868.57**	**5,489,605.71**	**1,829,868.57**	**9,149,342.86**
	ASISTENCIA TECNICA	**UNID**	**56**	9,149,342.86		**0.00**	**1,829,868.57**	**5,489,605.71**	**1,829,868.57**	9,149,342.86
VI	**CANALES LATERALES**	**GLOB**	1	3,155,629.12			**946,688.74**	**1,893,377.47**	**315,562.91**	3,155,629.12
	COMPONENTE B FORTALECMIMIENTO DE LA GESTION DE RECURSOS HIDRICOS EN LAS MICROCUENCAS			**17,994,250**	**469,000**	**12,700,158**	**1,356,078**	**2,115,446**	**1,353,568**	**17,994,250.00**
I	**EXPEDIENTES PARA EJECUCION**	**UNID**	**50**	469,000	469,000.00					469,000.00
II	**Caracterizacion de los Recursos hídricos de la microcuenca**			**6,603,568**	**0**	**6,603,568**	**0**	**0**	**0**	6,603,567.57
	- Identificacion de Disponibilidad de Recursos Hídricos y Zonas de Intensificacion productiva / analisis de conflictos	**UNID**	**50**	6,603,568		6,603,567.57				6,603,567.57
III	**Comité de Gestion de Recursos Hídricos de Microcuenca conformado y fortalecido realiza acciones de manejo de los recursos hídricos y productivos**			**10,921,682**	**0**	**6,096,591**	**1,356,078**	**2,115,446**	**1,353,568**	**10,921,682.43**
	Sensibilización para el manejo de los RRHH en microcuencas	**Glob**	1	954,655		954,655.41				954,655.41
	Organización para la conformación y formalizacion del comité de gestion de RRHH de microcuenca	**Glob**	1	1,356,078			1,356,078.38			1,356,078.38
	Acciones de Gestion del comité de RRHH de microcuenca	**Glob**	1	2,115,446				2,115,445.95		2,115,445.95
	Equipamiento para el Monitoreo de los Recursos Hídricos y Meteorológicos	**Glob**	1	5,141,935		5,141,935.14				5,141,935.14
	Recuperando Saberes	**Glob**	1	1,353,568					1,353,567.57	1,353,567.57
					0.00					
	COMPONENTE C			**39,372,540.44**	**5,905,881.07**	**7,874,508.09**	**9,843,135.11**	**8,661,958.90**	**7,087,057.28**	39,372,540.44
	GESTION ADMINISTRATIVA Y MONITOREO	**GLOB**	**1**	26,708,844.80	4,006,326.72	5,341,768.96	6,677,211.20	5,875,945.86	4,807,592.06	26,708,844.80
	SUPERVISION INTERNACIONAL	**GLOB**	**1**	12,663,696	1,899,554.35	2,532,739.13	3,165,923.91	2,786,013.04	2,279,465.22	12,663,695.64
	SUBTOTAL			**231,851,492.54**	**8,552,844.07**	**66,855,098.33**	**62,055,637.33**	**60,181,850.84**	**34,206,061.97**	**231,851,492.54**
	IMPREVISTOS			6,833,333.39	1,366,666.68	1,366,666.68	1,366,666.68	1,366,666.68	1,366,666.68	6,833,333.39
	COSTO TOTAL A PRECIO PRIVADO			**238,684,825.92**	**9,919,510.74**	**68,221,765.01**	**63,422,304.00**	**61,548,517.51**	**35,572,728.65**	**238,684,825.92**
	COSTO TOTAL A PRECIO PRIVADO EN DOLARES			**83,165,444.57**	**3,456,275.52**	**23,770,649.83**	**22,098,363.76**	**21,445,476.49**	**12,394,678.97**	**83,165,444.57**

TIPO DE CAMBIO S/. 2.87=1 DÓLAR

Anexo 3- 1

COSTO DE INVERSION DEL PROGRAMA A COSTOS SOCIAL S/.

	actividad	UNIDAD	CANTIDAD	TOTAL	DISTRIBUCION DE LA INVERSION (S/.) AÑO 1	AÑO 2	AÑO 3	AÑO 4	AÑO 5	TOTAL
	COMPONENTE A INFRAESTRUCTURA DE RIEGO			**146,133,397.89**	**1,979,966.36**	**38,281,854.78**	**41,737,144.22**	**43,799,815.24**	**20,334,617.29**	**146,133,397.89**
I	**EXPEDIENTE TECNICO Y ESTUDIOS**	**UNID**	**56**	1,979,966.36	1,979,966.36	0.00	0.00	0.00	0.00	1,979,966.36
II	**INFRAESTRUCTURA**			**127,417,849.26**	**0.00**	**38,225,354.78**	**38,225,354.78**	**31,854,462.31**	**19,112,677.39**	**127,417,849.26**
	OBRA DE RIEGO	**UNID**	**56**	108,952,142.26		32,685,642.68	32,685,642.68	27,238,035.56	16,342,821.34	
	MEDIO AMBIENTE	**UNID**	**56**	338,552.00		101,565.60	101,565.60	84,638.00	50,782.80	
	GASTOS GENERALES	**UNID**	**56**	5,946,835.00	0.00	1,784,050.50	1,784,050.50	1,486,708.75	892,025.25	5,946,835.00
	GASTOS DE SUPERVISION	**UNID**	**56**	12,180,320.00	0.00	3,654,096.00	3,654,096.00	3,045,080.00	1,827,048.00	12,180,320.00
III	**CAPACITACION**			**2,320,712.73**	**0.00**	**56,500.00**	**111,927.82**	**2,077,666.36**	**74,618.55**	**2,320,712.73**
	CONFORMACION DE COMITÉ DE REGANTES	**UNID**	**56**	56,500.00		56,500.00				56,500.00
	CAPACITACION EN MANEJO DEL AGUA O&M Y RIEGO PARCELARIO	**UNID**	**56**	373,092.73			111,927.82	186,546.36	74,618.55	373,092.73
	PROMOCION DE RIEGO TECNIFICADO	**UNID**	**56**	1,891,120.00				1,891,120.00		1,891,120.00
IV	**FOMENTO DE LA ASOCIATIVIDAD PARA LA PRODUCTIVIDAD**			**2,941,656.00**	**0.00**	**0.00**	**789,656.00**	**2,152,000.00**	**0.00**	**2,941,656.00**
	PRODUCTORES ORGANIZADOS Y FORMALIZADOS	**UNID**	**56**	789,656.00			789,656.00			789,656.00
	ESTUDIO DE MERCADO Y CADENA PRODUCTIVA	**UNID**	**56**	1,792,000.00				1,792,000.00		1,792,000.00
	SUPERVISOR	**UNID**	**56**	360,000.00				360,000.00		360,000.00
V	**ASISTENCIA**			**8,317,584.42**	**0.00**	**0.00**	**1,663,516.88**	**5,822,309.09**	**831,758.44**	**8,317,584.42**
	ASISTENCIA TECNICA	**UNID**	**56**	8,317,584.42			1,663,516.88	5,822,309.09	831,758.44	8,317,584.42
	0									
VI	**CANALES LATERALES**			3,155,629.12			946,688.74	1,893,377.47	315,562.91	3,155,629.12
	0	0	**0**							
	COMPONENTE B FORTALECMIMIENTO DE LA GESTION DE RECURSOS HIDRICOS EN LAS MICROCUENCAS	0	**0**	**16,006,256**	**460,558**	**11,250,050**	**1,217,420**	**1,898,981**	**1,179,246**	**16,006,256.00**
I	**EXPEDIENTES PARA EJECUCION**	**UNID**	**50**	460,558.00	460,558.00					460,558.00
II	**Caracterizacion de los Recursos hídricos de la microcuenca**			6,009,246.49	0.00	6,009,246.49	0.00	0.00	0.00	6,009,246.49
	- Identificacion de Disponibilidad de Recursos Hídricos y Zonas de Intensificacion productiva / analisis de conflictos	**UNID**	**50**	6,009,246.49		6,009,246.49				
III	**Comité de Gestion de Recursos Hídricos de Microcuenca conformado y fortalecido realiza acciones de manejo de los recursos hídricos y productivos**			**9,536,451.51**	**0.00**	**5,240,803.89**	**1,217,420.32**	**1,898,980.81**	**1,179,246.49**	**9,536,451.51**
	Sensibilización para el manejo de los RRHH en microcuencas	**UNID**	**50**	845,478.92		845,478.92	0.00	0.00	0.00	845,478.92
	Organización para la conformación y formalizacion del comité de gestion de RRHH de microcuenca	**UNID**	**50**	1,217,420.32			1,217,420.32			1,217,420.32
	Acciones de Gestion del comité de RRHH de microcuenca	**UNID**	**50**	1,898,980.81				1,898,980.81		1,898,980.81
	Equipamiento para el Monitoreo de los Recursos Hídricos y Meteorológicos	**GLOB**	**1**	4,395,324.97		4,395,324.97				4,395,324.97
	Recuperando Saberes	**GLOB**	**1**	1,179,246.49					1,179,246.49	1,179,246.49
	0									
	0									
	COMPONENTE C			**33,868,475.17**	**6,773,695.03**	**6,773,695.03**	**6,773,695.03**	**6,773,695.03**	**6,773,695.03**	33,868,475.17
	GESTION ADMINISTRATIVA Y MONITOREO	**GLOB**	**1**	22,517,205.93	4,503,441.19	4,503,441.19	4,503,441.19	4,503,441.19	4,503,441.19	22,517,205.93
	SUPERVISION INTERNACIONAL			11,351,269.24	2,270,253.85	2,270,253.85	2,270,253.85	2,270,253.85	2,270,253.85	11,351,269.24
	SUBTOTAL			196,008,129.06	9,214,219.40	56,305,600.19	49,728,259.57	52,472,491.09	28,287,558.81	196,008,129.06
	IMPREVISTOS			6,833,333.39	1,366,666.68	1,366,666.68	1,366,666.68	1,366,666.68	1,366,666.68	6,833,333.39
	COSTO TOTAL A PRECIO SOCIAL			**202,841,462.45**	**10,580,886.08**	**57,672,266.87**	**51,094,926.25**	**53,839,157.77**	**29,654,225.49**	**202,841,462.45**
	COSTO TOTAL A PRECIO SOCIAL EN DOLARES			**70,676,467.75**	**3,686,719.89**	**20,094,866.50**	**17,803,110.19**	**18,759,288.42**	**10,332,482.75**	**70,676,467.75**
	TIPO DE CAMBIO S/. 2.87=1 DÓLAR									

Anexo 3 - 2

PRESUPUESTO A PRECIOS PRIVADOS/SOCIALES (Sistema de Riego)

				Estudios	obras de infraestructura							
Categoria					Costo IR	Manejo Ambienta	Gastos Generale	Gastos de Super	subtotal	Utilidades	IMP.RENTA	TOTAL
Tipo 1		"Infraestructure de Riego" TIPO 1 (2 Nos.)	0.14780931	296,134.00	17,771,964.00	80,000.00	674,005.00	1,836,555.57	20,362,524.57	2,036,252.46	610,875.74	23,009,652.76
Tipo 2-A		Congromerado "Infraestructure de Riego" TIPO 2-A	0.04220034	42,640.00	5,074,193.00	4,202.00	183,475.00	524,367.34	5,786,237.34	578,623.73	173,587.12	6,538,448.19
Tipo 2-B		Congromerado "Infraestructure de Riego" TIPO 2-B	0.09603613	329,076.00	11,546,673.00	64,353.00	773,135.00	1,193,233.71	13,577,394.71	1,357,739.47	407,321.84	15,342,456.02
Tipo 3-A		Congromerado "Infraestructure de Riego" TIPO 3-A	0.2379487	333,025.00	26,559,233.00	52,140.00	1,054,538.00	2,744,632.34	30,410,543.34	3,041,054.33	912,316.30	34,363,913.98
Tipo 3-B		Congromerado "Infraestructure de Riego" TIPO 3-B	0.13831132	445,377.00	15,421,682.00	30,211.00	839,612.00	1,593,677.32	17,885,182.32	1,788,518.23	536,555.47	20,210,256.02
Tipo 4-A		Congromerado "Infraestructure de Riego" TIPO 4-A	0.2285921	468,820.00	28,674,719.67	74,535.00	1,504,284.00	2,963,246.83	33,216,785.50	3,321,678.55	996,503.57	37,534,967.62
Tipo 4-B		Congromerado "Infraestructure de Riego" TIPO 4-B	0.06262683	159,991.00	7,229,835.00	18,992.00	493,145.00	747,131.48	8,489,103.48	848,910.35	254,673.10	9,592,686.93
Tipo 5		Congromerado "Infraestructure de Riego" TIPO 5	0.04647527	102,900.00	5,588,108.77	14,119.00	424,641.00	577,475.41	6,604,344.19	660,434.42	198,130.33	7,462,908.93
		GRAND TOTAL		**2,177,963.00**	**117,866,408.44**	**338,552.00**	**5,946,835.00**	**12,180,320.00**	**136,332,115.44**	**13,633,211.54**	**4,089,963.46**	**154,055,290.45**
				0.909090909	0.840336134	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES		**1,979,966.36**	**99,047,402.05**	**307,774.55**	**5,406,213.64**	**11,073,018.18**	**115,834,408.42**	**11,583,440.84**	0.00	**127,417,849.26**

COSTO DE SUBPROYECTO DE CADA CATEGORÍA

Lista de Subproyectos : "Infraestructure de Riego" TIPO 1

No	Symbol	NOMBRE DEL PROYECTO		Estudios	Costo IR	Manejo Ambienta	Gastos Generale	Gastos de Super	subtotal	Utilidades	IMP.RENTA	TOTAL
1	CAJ-1	Construcción Canal de Irrigación El Rejo	0.07326931	148,067.00	8,809,591.00	40,000.00	536,428.00	910,383.53	10,296,402.53	1,029,640.25	308,892.08	11,634,934.86
2	ANC-11	Construcción Canal Cordillera Negra	0.07454	148,067.00	8,962,373.00	40,000.00	137,577.00	926,172.03	10,066,122.03	1,006,612.20	301,983.66	11,374,717.90
		GRAND TOTAL		296,134.00	17,771,964.00	80,000.00	674,005.00	1,836,555.57	20,362,524.57	2,036,252.46	610,875.74	23,009,652.76
				0.909090909	0.840336134	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES		269,212.73	14,934,423.53	72,727.27	612,731.82	1,669,595.97	17,289,478.59	1,728,947.86	0.00	19,018,426.45

Lista de Subproyectos: "Infraestructure de Riego" TIPO 2-A

No	Symbol	NOMBRE DEL PROYECTO		Estudios	Costo IR	Manejo Ambienta	Gastos Generale	Gastos de Super	subtotal	Utilidades	IMP.RENTA	TOTAL
3	ANC-5	Construcción Canal de Irrigacion Sol Naciente de San Luis	0.04220034	42,640.00	5,074,193.00	4,202.00	183,475.00	524,367.34	5,786,237.34	578,623.73	173,587.12	6,538,448.19
				0.909090909	0.840336134	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES		38,763.64	4,264,027.73	3,820.00	166,795.45	476,697.58	4,911,340.76	491,134.08	0.00	5,402,474.84

Lista de Subproyectos: "Infraestructure de Riego" TIPO 2-B

No	Symbol	NOMBRE DEL PROYECTO		Estudios	Costo IR	Manejo Ambienta	Gastos Generale	Gastos de Super	subtotal	Utilidades	IMP.RENTA	TOTAL
4	AYA-1	Construcción y Mejoramiento del Sistema de Riego Cangallo	0.03864319	245,042.00	4,646,171.00	46,958.00	464,618.00	480,135.52	5,637,882.52	563,788.25	169,136.48	6,370,807.25
5	AYA-13	Const. Canal y Represa Tintayccocha-Acoro	0.05739294	84,034.00	6,900,502.00	17,395.00	308,517.00	713,098.19	7,939,512.19	793,951.22	238,185.37	8,971,648.77
		GRAND TOTAL		329,076.00	11,546,673.00	64,353.00	773,135.00	1,193,233.71	13,577,394.71	1,357,739.47	407,321.84	15,342,456.02
				0.909090909	0.840336134	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES		299,160.00	9,703,086.55	58,502.73	702,850.00	1,084,757.92	11,549,197.20	1,154,919.72	0.00	12,704,116.92

Lista de Subproyectos: "Infraestructure de Riego" TIPO 3-A

No	Symbol	NOMBRE DEL PROYECTO		Estudios	Costo IR	Manejo Ambienta	Gastos Generale	Gastos de Super	subtotal	Utilidades	IMP.RENTA	TOTAL
6	AMA-2	Mejor. del Sist. Riego San Juan Marañón-La Papaya	0.02207646	21,008.00	2,464,119.00	6,218.00	44,688.00	254,642.17	2,769,667.17	276,966.72	83,090.02	3,129,723.90
7	AMA-6	Mejoramiento del Sistema de Riego Naranjos - Canal El Tigre	0.02065215	16,807.00	2,305,141.00	5,798.00	52,200.00	238,213.38	2,601,352.38	260,135.24	78,040.57	2,939,528.18
8	CAJ-2	Rehabilitación Canal El Huayo	0.02176571	61,261.00	2,429,434.00	6,174.00	213,150.00	251,057.82	2,899,815.82	289,981.58	86,994.47	3,276,791.88
9	CAJ-7	Irrigacion Cochán Aito	0.02836296	53,193.00	3,165,802.00	7,983.00	158,290.00	327,154.12	3,659,229.12	365,922.91	109,776.87	4,134,928.91
10	ANC-3	Construcción Canal de Irrigación Casablanca- Jocosbamba – Quiches (Joquillo	0.02725679	42,017.00	3,042,334.00	7,647.00	122,084.00	314,394.93	3,486,459.93	348,645.99	104,593.80	3,939,699.73
11	ANC-10	Const. Canal de Riego Aynin-Huasta	0.02864768	21,008.00	3,197,582.00	4,202.00	60,738.00	330,438.27	3,592,960.27	359,296.03	107,788.81	4,060,045.10
12	ANC-16	Const. Sistema de riego Jatun Parco	0.0367549	42,017.00	4,102,489.00	4,202.00	65,642.00	423,951.40	4,596,284.40	459,628.44	137,888.53	5,193,801.37
13	ANC-17	Mejoramiento Canal Chuayas-Huaycho	0.03224945	37,815.00	3,599,602.00	4,202.00	143,219.00	371,983.03	4,119,006.03	411,900.60	123,570.18	4,654,476.82
14	ANC-18	Mejoramiento Chinguil - Cruzpampa	0.02018259	37,899.00	2,252,730.00	5,714.00	194,527.00	232,797.22	2,685,768.22	268,576.82	80,573.05	3,034,918.09
		GRAND TOTAL		333,025.00	26,559,233.00	52,140.00	1,054,538.00	2,744,632.34	30,410,543.34	3,041,054.33	912,316.30	34,363,913.98
				0.909090909	0.840336134	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES		302,750.00	22,318,683.19	47,400.00	958,670.91	2,495,120.31	25,819,874.42	2,581,987.44	0.00	28,401,861.86

Lista de Subproyectos: "Infraestructure de Riego" TIPO 3-B

No	Symbol	NOMBRE DEL PROYECTO		Estudios	Costo IR	Manejo Ambienta	Gastos Generale	Gastos de Super	subtotal	Utilidades	IMP.RENTA	TOTAL
15	JUNIN-3	Irrigación Cotosh II Etapa	0.02333333	168,067.00	2,601,661.00	6,555.00	232,702.00	268,855.77	3,109,773.77	310,977.38	93,293.21	3,514,044.36
16	JUNIN-6	Construccion del Sistema de Riego Rupasha - Vista Alegre	0.0199738	56,134.00	2,227,074.00	5,630.00	222,708.00	230,145.93	2,685,557.93	268,555.79	80,566.74	3,034,680.46
17	JUNIN-7	Mejoramiento del Sistema de Riego de las Localidades de Yauli y Jajapaqui	0.02437181	68,487.00	2,717,451.00	9,622.00	271,746.00	280,821.51	3,279,640.51	327,964.05	98,389.22	3,705,993.78
18	AYA-5	Construccion de Presa y Sistema de Riego Chaqllani-Pucapampa	0.03646148	76,723.00	4,065,447.00	4,202.00	48,047.00	420,123.48	4,537,819.48	453,781.95	136,134.58	5,127,736.01
19	AYA-12	Const. presa y sistema de riego Chito-Sachabamca y Quishuarcancha, Chiara	0.03417091	75,966.00	3,810,049.00	4,202.00	64,409.00	393,730.64	4,272,390.64	427,239.06	128,171.72	4,827,801.42
		GRAND TOTAL		445,377.00	15,421,682.00	30,211.00	839,612.00	1,593,677.32	17,885,182.32	1,788,518.23	536,555.47	20,210,256.02
				0.909090909	0.840336134	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES		404,888.18	12,959,396.64	27,464.55	763,283.64	1,448,797.56	15,198,942.38	1,519,894.24	0.00	16,718,836.62

PRESUPUESTO A PRECIOS PRIVADOS/SOCIALES (Sistema de Riego)

			capacitacion						
Categoria			PRT	Capacitación	Conformacion de Comites	subtotal	Utilidades	IMP.RENTA	TOTAL
Tipo 1		"Infraestructure de Riego" TIPO 1 (2 Nos.)	151,965.00	16,806.00	7,500.00	176,271.00	17,627.10	5,288.13	199,186.23
Tipo 2-A		Congromerado "Infraestructure de Riego" TIPO 2-A	50,655.00	4,202.00	3,000.00	57,857.00	5,785.70	1,735.71	65,378.41
Tipo 2-B		Congromerado "Infraestructure de Riego" TIPO 2-B	118,195.00	19,910.73	5,000.00	143,105.73	14,310.57	4,293.17	161,709.47
Tipo 3-A		Congromerado "Infraestructure de Riego" TIPO 3-A	287,045.00	49,581.00	11,700.00	348,326.00	34,832.60	10,449.78	393,608.38
Tipo 3-B		Congromerado "Infraestructure de Riego" TIPO 3-B	253,275.00	59,244.00	6,000.00	318,519.00	31,851.90	9,555.57	359,926.47
Tipo 4-A		Congromerado "Infraestructure de Riego" TIPO 4-A	607,860.00	122,508.00	14,300.00	744,668.00	74,466.80	22,340.04	841,474.84
Tipo 4-B		Congromerado "Infraestructure de Riego" TIPO 4-B	168,850.00	29,411.00	6,000.00	204,261.00	20,426.10	6,127.83	230,814.93
Tipo 5		Congromerado "Infraestructure de Riego" TIPO 5	253,275.00	71,430.00	3,000.00	327,705.00	32,770.50	9,831.15	370,306.65
		GRAND TOTAL	**1,891,120.00**	**373,092.73**	**56,500.00**	**2,320,712.73**	**232,071.27**	**69,621.38**	**2,622,405.38**
			0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	**1,719,200.00**	**339,175.21**	**51,363.64**	**2,109,738.84**	**210,973.88**	**0.00**	**2,320,712.73**

COSTO DE SUBPROYECTO DE CADA CATEGORÍA

Lista de Subproyectos : "Infraestructure de Riego" TIPO 1

No	Symbol	NOMBRE DEL PROYECTO	PRT	Capacitación	Conformacion de Cor	subtotal	Utilidades	IMP.RENTA	TOTAL
1	CAJ-1	Construcción Canal de Irrigación El Rejo	50,655.00	8,403.00	4,000.00	63,058.00	6,305.80	1,891.74	71,255.54
2	ANC-11	Construcción Canal Cordillera Negra	101,310.00	8,403.00	3,500.00	113,213.00	11,321.30	3,396.39	127,930.69
		GRAND TOTAL	151,965.00	16,806.00	7,500.00	176,271.00	17,627.10	5,288.13	199,186.23
			0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	138,150.00	15,278.18	6,818.18	160,246.36	16,024.64	0.00	176,271.00

Lista de Subproyectos: "Infraestructure de Riego" TIPO 2-A

No	Symbol	NOMBRE DEL PROYECTO	PRT	Capacitación	Conformacion de Cor	subtotal	Utilidades	IMP.RENTA	TOTAL
3	ANC-5	Construcción Canal de Irrigacion Sol Naciente de San Luis	50,655.00	4,202.00	3,000.00	57,857.00	5,785.70	1,735.71	65,378.41
			0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	46,050.00	3,820.00	2,727.27	52,597.27	5,259.73	0.00	57,857.00

Lista de Subproyectos: "Infraestructure de Riego" TIPO 2-B

No	Symbol	NOMBRE DEL PROYECTO	PRT	Capacitación	Conformacion de Cor	subtotal	Utilidades	IMP.RENTA	TOTAL
4	AYA-1	Construcción y Mejoramiento del Sistema de Riego Cangallo	33,770.00	13,607.73	2,500.00	49,877.73	4,987.77	1,496.33	56,361.83
5	AYA-13	Const. Canal y Represa Tintayccocha-Acoro	84,425.00	6,303.00	2,500.00	93,228.00	9,322.80	2,796.84	105,347.64
		GRAND TOTAL	118,195.00	19,910.73	5,000.00	143,105.73	14,310.57	4,293.17	161,709.47
			0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	107,450.00	18,100.66	4,545.45	130,096.12	13,009.61	0.00	143,105.73

Lista de Subproyectos: "Infraestructure de Riego" TIPO 3-A

No	Symbol	NOMBRE DEL PROYECTO	PRT	Capacitación	Conformacion de Cor	subtotal	Utilidades	IMP.RENTA	TOTAL
6	AMA-2	Mejor. del Sist. Riego San Juan Marañón-La Papaya	16,885.00	2,101.00	1,300.00	20,286.00	2,028.60	608.58	22,923.18
7	AMA-6	Mejoramiento del Sistema de Riego Naranjos - Canal El Tigre	16,885.00	4,202.00	1,300.00	22,387.00	2,238.70	671.61	25,297.31
8	CAJ-2	Rehabilitación Canal El Huayo	16,885.00	8,403.00	1,300.00	26,588.00	2,658.80	797.64	30,044.44
9	CAJ-7	Irrigacion Cochán Alto	33,770.00	8,403.00	1,300.00	43,473.00	4,347.30	1,304.19	49,124.49
10	ANC-3	Construcción Canal de Irrigación Casablanca- Jocosbamba – Quiches (Joquilio	50,655.00	4,202.00	1,300.00	56,157.00	5,615.70	1,684.71	63,457.41
11	ANC-10	Const. Canal de Riego Aynin-Huasta	16,885.00	4,202.00	1,300.00	22,387.00	2,238.70	671.61	25,297.31
12	ANC-16	Const. Sistema de riego Jatun Parco	16,885.00	4,202.00	1,300.00	22,387.00	2,238.70	671.61	25,297.31
13	ANC-17	Mejoramiento Canal Chuayas-Huaycho	50,655.00	9,664.00	1,300.00	61,619.00	6,161.90	1,848.57	69,629.47
14	ANC-18	Mejoramiento Chinguil - Cruzpampa	67,540.00	4,202.00	1,300.00	73,042.00	7,304.20	2,191.26	82,537.46
		GRAND TOTAL	287,045.00	49,581.00	11,700.00	348,326.00	34,832.60	10,449.78	393,608.38
			0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	260,950.00	45,073.64	10,636.36	316,660.00	31,666.00	0.00	348,326.00

Lista de Subproyectos: "Infraestructure de Riego" TIPO 3-B

No	Symbol	NOMBRE DEL PROYECTO	PRT	Capacitación	Conformacion de Cor	subtotal	Utilidades	IMP.RENTA	TOTAL
15	JUNIN-3	Irrigación Cotosh II Etapa	84,425.00	20,168.00	1,200.00	105,793.00	10,579.30	3,173.79	119,546.09
16	JUNIN-6	Construccion del Sistema de Riego Rupasha - Vista Alegre	16,885.00	10,504.00	1,200.00	28,589.00	2,858.90	857.67	32,305.57
17	JUNIN-7	Mejoramiento del Sistema de Riego de las Localidades de Yauli y Jajapaqui	33,770.00	20,168.00	1,200.00	55,138.00	5,513.80	1,654.14	62,305.94
18	AYA-5	Construccion de Presa y Sistema de Riego Chaqllani-Pucapampa	16,885.00	4,202.00	1,200.00	22,287.00	2,228.70	668.61	25,184.31
19	AYA-12	Const. presa y sistema de riego Chito-Sachabamca y Quishuarcancha, Chiara	101,310.00	4,202.00	1,200.00	106,712.00	10,671.20	3,201.36	120,584.56
		GRAND TOTAL	253,275.00	59,244.00	6,000.00	318,519.00	31,851.90	9,555.57	359,926.47
			0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	230,250.00	53,858.18	5,454.55	289,562.73	28,956.27	0.00	318,519.00

PRESUPUESTO A PRECIOS PRIVADOS/SOCIALES (Sistema de Riego)

			fortalecimiento de productores							
Categoria			organización de Produ	estudio de mercado	estudio de deb. CP	SUPERVISOR	SUB TOTAL	Utilidades	IMP.RENTA	TOTAL
Tipo 1		"Infraestructure de Riego" TIPO 1 (2 Nos.)	57,579.08	30,000.00	34,000.00	12,857.14	134,436.23	13,443.62	4,033.09	151,912.94
Tipo 2-A		Congromerado "Infraestructure de Riego" TIPO 2-A	20,563.96	15,000.00	17,000.00	6,857.14	59,421.10	5,942.11	1,782.63	67,145.84
Tipo 2-B		Congromerado "Infraestructure de Riego" TIPO 2-B	49,353.50	30,000.00	34,000.00	13,714.29	127,067.79	12,706.78	3,812.03	143,586.60
Tipo 3-A		Congromerado "Infraestructure de Riego" TIPO 3-A	127,496.54	135,000.00	153,000.00	57,362.64	472,859.18	47,285.92	14,185.78	534,330.87
Tipo 3-B		Congromerado "Infraestructure de Riego" TIPO 3-B	127,496.54	75,000.00	85,000.00	29,714.29	317,210.83	31,721.08	9,516.32	358,448.23
Tipo 4-A		Congromerado "Infraestructure de Riego" TIPO 4-A	238,541.92	330,000.00	374,000.00	144,146.52	1,086,688.44	108,668.84	32,600.65	1,227,957.93
Tipo 4-B		Congromerado "Infraestructure de Riego" TIPO 4-B	69,917.46	60,000.00	68,000.00	27,047.62	224,965.08	22,496.51	6,748.95	254,210.54
Tipo 5		Congromerado "Infraestructure de Riego" TIPO 5	98,707.00	165,000.00	187,000.00	68,300.37	519,007.37	51,900.74	15,570.22	586,478.32
		GRAND TOTAL	**789,656.00**	**840,000.00**	**952,000.00**	**360,000.00**	**2,941,656.00**	**294,165.60**	**88,249.68**	**3,324,071.28**
			0.909090909	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	**717,869.09**	**763,636.36**	**865,454.55**	**327,272.73**	**2,674,232.73**	**267,423.27**	**0.00**	**2,941,656.00**

COSTO DE SUBPROYECTO DE CADA CATEGORÍA

Lista de Subproyectos : "Infraestructure de Riego" TIPO 1

No	Symbol	NOMBRE DEL PROYECTO	organización de Produ	estudio de mercado	estudio de deb. CP	ESPECIALISTA	SUB TOTAL	Utilidades	IMP.RENTA	TOTAL
1	CAJ-1	Construcción Canal de Irrigación El Rejo	41,127.92	15,000.00	17,000.00	6,857.14	79,985.06	7,998.51	2,399.55	90,383.12
2	ANC-11	Construcción Canal Cordillera Negra	16,451.17	15,000.00	17,000.00	6,000.00	54,451.17	5,445.12	1,633.54	61,529.82
		GRAND TOTAL	57,579.08	30,000.00	34,000.00	12,857.14	134,436.23	13,443.62	4,033.09	151,912.94
			0.909090909	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	52,344.62	27,272.73	30,909.09	11,688.31	122,214.75	12,221.48	0.00	134,436.23

Lista de Subproyectos: "Infraestructure de Riego" TIPO 2-A

No	Symbol	NOMBRE DEL PROYECTO	organización de Produ	estudio de mercado	estudio de deb. CP	ESPECIALISTA	SUB TOTAL	Utilidades	IMP.RENTA	TOTAL
3	ANC-5	Construcción Canal de Irrigacion Sol Naciente de San Luis	20,563.96	15,000.00	17,000.00	6,857.14	59,421.10	5,942.11	1,782.63	67,145.84
			0.909090909	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	18,694.51	13,636.36	15,454.55	6,233.77	54,019.18	5,401.92	0.00	59,421.10

Lista de Subproyectos: "Infraestructure de Riego" TIPO 2-B

No	Symbol	NOMBRE DEL PROYECTO	organización de Produ	estudio de mercado	estudio de deb. CP	ESPECIALISTA	SUB TOTAL	Utilidades	IMP.RENTA	TOTAL
4	AYA-1	Construcción y Mejoramiento del Sistema de Riego Cangallo	16,451.17	15,000.00	17,000.00	6,857.14	55,308.31	5,530.83	1,659.25	62,498.39
5	AYA-13	Const. Canal y Represa Tintayccocha-Acoro	32,902.33	15,000.00	17,000.00	6,857.14	71,759.48	7,175.95	2,152.78	81,088.21
		GRAND TOTAL	49,353.50	30,000.00	34,000.00	13,714.29	127,067.79	12,706.78	3,812.03	143,586.60
			0.909090909	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	44,866.82	27,272.73	30,909.09	12,467.53	115,516.17	11,551.62	0.00	127,067.79

Lista de Subproyectos: "Infraestructure de Riego" TIPO 3-A

No	Symbol	NOMBRE DEL PROYECTO	organización de Produ	estudio de mercado	estudio de deb. CP	ESPECIALISTA	SUB TOTAL	Utilidades	IMP.RENTA	TOTAL
6	AMA-2	Mejor. del Sist. Riego San Juan Marañón-La Papaya	8,225.58	15,000.00	17,000.00	5,538.46	45,764.04	4,576.40	1,372.92	51,713.37
7	AMA-6	Mejoramiento del Sistema de Riego Naranjos - Canal El Tigre	8,225.58	15,000.00	17,000.00	5,538.46	45,764.04	4,576.40	1,372.92	51,713.37
8	CAJ-2	Rehabilitación Canal El Huayo	12,338.38	15,000.00	17,000.00	6,000.00	50,338.38	5,033.84	1,510.15	56,882.36
9	CAJ-7	Irrigacion Cochán Alto	16,451.17	15,000.00	17,000.00	6,000.00	54,451.17	5,445.12	1,633.54	61,529.82
10	ANC-3	Construcción Canal de Irrigación Casablanca- Jocosbamba – Quiches (Joquillo	20,563.96	15,000.00	17,000.00	6,857.14	59,421.10	5,942.11	1,782.63	67,145.84
11	ANC-10	Const. Canal de Riego Aynin-Huasta	8,225.58	15,000.00	17,000.00	6,857.14	47,082.73	4,708.27	1,412.48	53,203.48
12	ANC-16	Const. Sistema de riego Jatun Parco	8,225.58	15,000.00	17,000.00	6,857.14	47,082.73	4,708.27	1,412.48	53,203.48
13	ANC-17	Mejoramiento Canal Chuayas-Huaycho	20,563.96	15,000.00	17,000.00	6,857.14	59,421.10	5,942.11	1,782.63	67,145.84
14	ANC-18	Mejoramiento Chinguil - Cruzpampa	24,676.75	15,000.00	17,000.00	6,857.14	63,533.89	6,353.39	1,906.02	71,793.30
		GRAND TOTAL	127,496.54	135,000.00	153,000.00	57,362.64	472,859.18	47,285.92	14,185.78	534,330.87
			0.909090909	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	115,905.95	122,727.27	139,090.91	52,147.85	429,871.98	42,987.20	0.00	472,859.18

Lista de Subproyectos: "Infraestructure de Riego" TIPO 3-B

No	Symbol	NOMBRE DEL PROYECTO	organización de Produ	estudio de mercado	estudio de deb. CP	ESPECIALISTA	SUB TOTAL	Utilidades	IMP.RENTA	TOTAL
15	JUNIN-3	Irrigación Cotosh II Etapa	32,902.33	15,000.00	17,000.00	5,333.33	70,235.67	7,023.57	2,107.07	79,366.30
16	JUNIN-6	Construccion del Sistema de Riego Rupasha - Vista Alegre	8,225.58	15,000.00	17,000.00	5,333.33	45,558.92	4,555.89	1,366.77	51,481.58
17	JUNIN-7	Mejoramiento del Sistema de Riego de las Localidades de Yauli y Jajapaqui	16,451.17	15,000.00	17,000.00	5,333.33	53,784.50	5,378.45	1,613.54	60,776.49
18	AYA-5	Construccion de Presa y Sistema de Riego Chaqllani-Pucapampa	12,338.38	15,000.00	17,000.00	6,857.14	51,195.52	5,119.55	1,535.87	57,850.94
19	AYA-12	Const. presa y sistema de riego Chito-Sachabamca y Quishuarcancha, Chiara	57,579.08	15,000.00	17,000.00	6,857.14	96,436.23	9,643.62	2,893.09	108,972.94
		GRAND TOTAL	127,496.54	75,000.00	85,000.00	29,714.29	317,210.83	31,721.08	9,516.32	358,448.23
			0.909090909	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	115,905.95	68,181.82	77,272.73	27,012.99	288,373.48	28,837.35	0.00	317,210.83

PRESUPUESTO A PRECIOS PRIVADOS/SOCIALES (Sistema de Riego)

			Asistencia Tecnica				CANALES LATERALES		
Categoría			asistencia tecnica	Utilidades	IMP.RENTA	TOTAL		Precio Privado S/.	Precio Social S/.
Tipo 1		"Infraestructure de Riego" TIPO 1 (2 Nos.)	1,243,600.00	0.00	0.00	1,243,600.00	93,667.99	24,994,153.92	20,822,559.85
Tipo 2-A		Congromerado "Infraestructure de Riego" TIPO 2-A	488,557.14	0.00	0.00	488,557.14	114,376.10	7,316,545.69	6,117,035.53
Tipo 2-B		Congromerado "Infraestructure de Riego" TIPO 2-B	266,485.71	0.00	0.00	266,485.71	69,487.62	16,312,801.43	13,585,197.80
Tipo 3-A		Congromerado "Infraestructure de Riego" TIPO 3-A	1,865,400.00	0.00	0.00	1,865,400.00	772,503.10	38,262,781.33	31,994,118.32
Tipo 3-B		Congromerado "Infraestructure de Riego" TIPO 3-B	1,643,328.57	0.00	0.00	1,643,328.57	610,886.99	23,628,223.29	19,864,276.68
Tipo 4-A		Congromerado "Infraestructure de Riego" TIPO 4-A	2,442,785.71	0.00	0.00	2,442,785.71	832,617.56	43,348,623.67	36,358,997.51
Tipo 4-B		Congromerado "Infraestructure de Riego" TIPO 4-B	710,628.57	0.00	0.00	710,628.57	333,621.24	11,281,953.21	9,496,628.89
Tipo 5		Congromerado "Infraestructure de Riego" TIPO 5	488,557.14	0.00	0.00	488,557.14	119,858.06	9,131,009.11	7,685,972.85
		GRAND TOTAL	**9,149,342.86**	**0.00**	**0.00**	**9,149,342.86**	**3,155,629.12**	**174,276,091.63**	**145,924,787.42**
			0.909090909				1.00		
		PRECIOS SOCIALES	**8,317,584.42**			**8,317,584.42**	**3,155,629.12**		**146,133,397.89**

COSTO DE SUBPROYECTO DE CADA CATEGORÍA

Lista de Subproyectos : "Infraestructure de Riego" TIPO 1

No	Symbol	NOMBRE DEL PROYECTO	asistencia tecnica	Utilidades	IMP.RENTA	TOTAL		Precio Privado	(S./) Precio Social
1	CAJ-1	Construcción Canal de Irrigación El Rejo	666,214.29			666,214.29	50,537.20	12,661,392.01	
2	ANC-11	Construcción Canal Cordillera Negra	577,385.71			577,385.71	43,130.79	12,332,761.91	
		GRAND TOTAL	1,243,600.00	0.00	0.00	1,243,600.00	93,667.99	24,994,153.92	
			0.909090909				1.00		
		PRECIOS SOCIALES	1,130,545.45			1,130,545.45	93,667.99		20,822,559.85

Lista de Subproyectos: "Infraestructure de Riego" TIPO 2-A

No	Symbol	NOMBRE DEL PROYECTO	asistencia tecnica	Utilidades	IMP.RENTA	TOTAL		Precio Privado	(S./) Precio Social
3	ANC-5	Construcción Canal de Irrigacion Sol Naciente de San Luis	488,557.14			488,557.14	114,376.10	7,316,545.69	
			0.909090909				1.00		
		PRECIOS SOCIALES	444,142.86			444,142.86	114,376.10		6,117,035.53

Lista de Subproyectos: "Infraestructure de Riego" TIPO 2-B

No	Symbol	NOMBRE DEL PROYECTO	asistencia tecnica	Utilidades	IMP.RENTA	TOTAL		Precio Privado	(S./) Precio Social
4	AYA-1	Construcción y Mejoramiento del Sistema de Riego Cangallo	44,414.29			44,414.29	29,887.43	6,809,011.19	
5	AYA-13	Const. Canal y Represa Tintayccocha-Acoro	222,071.43			222,071.43	39,600.19	9,503,790.24	
		GRAND TOTAL	266,485.71	0.00	0.00	266,485.71	69,487.62	16,312,801.43	0.00
			0.909090909				1.00		
		PRECIOS SOCIALES	242,259.74			242,259.74	69,487.62		13,585,197.80

Lista de Subproyectos: "Infraestructure de Riego" TIPO 3-A

No	Symbol	NOMBRE DEL PROYECTO	asistencia tecnica	Utilidades	IMP.RENTA	TOTAL		Precio Privado	(S./) Precio Social
6	AMA-2	Mejor. del Sist. Riego San Juan Marañón-La Papaya	88,828.57			88,828.57		3,314,197.02	
7	AMA-6	Mejoramiento del Sistema de Riego Naranjos - Canal El Tigre	0.00			0.00		3,033,345.87	
8	CAJ-2	Rehabilitación Canal El Huayo	399,728.57			399,728.57	255,304.60	4,080,012.85	
9	CAJ-7	Irrigacion Cochán Alto	266,485.71			266,485.71	58,282.84	4,623,544.77	
10	ANC-3	Construcción Canal de Irrigación Casablanca- Jocosbamba – Quiches (Joquillo	222,071.43			222,071.43	130,669.80	4,465,061.21	
11	ANC-10	Const. Canal de Riego Aynin-Huasta	222,071.43			222,071.43	48,563.12	4,430,188.44	
12	ANC-16	Const. Sistema de riego Jatun Parco	266,485.71			266,485.71	152,823.45	5,733,628.33	
13	ANC-17	Mejoramiento Canal Chuayas-Huaycho	177,657.14			177,657.14	39,324.09	5,046,048.37	
14	ANC-18	Mejoramiento Chinguil - Cruzpampa	222,071.43			222,071.43	87,535.20	3,536,754.48	
		GRAND TOTAL	1,865,400.00	0.00	0.00	1,865,400.00	772,503.10	38,262,781.33	0.00
			0.909090909				1.00		
		PRECIOS SOCIALES	1,695,818.18			1,695,818.18	772,503.10		31,994,118.32

Lista de Subproyectos: "Infraestructure de Riego" TIPO 3-B

No	Symbol	NOMBRE DEL PROYECTO	asistencia tecnica	Utilidades	IMP.RENTA	TOTAL		Precio Privado	(S./) Precio Social
15	JUNIN-3	Irrigación Cotosh II Etapa	266,485.71			266,485.71	33,084.12	4,180,593.58	
16	JUNIN-6	Construccion del Sistema de Riego Rupasha - Vista Alegre	177,657.14			177,657.14	94,318.45	3,446,577.20	
17	JUNIN-7	Mejoramiento del Sistema de Riego de las Localidades de Yauli y Jajapaqui	88,828.57			88,828.57	43,045.14	4,029,436.91	
18	AYA-5	Construccion de Presa y Sistema de Riego Chaqllani-Pucapampa	444,142.86			444,142.86	139,215.17	5,870,852.28	
19	AYA-12	Const. presa y sistema de riego Chito-Sachabamca y Quishuarcancha, Chiara	666,214.29			666,214.29	301,224.11	6,100,763.31	
		GRAND TOTAL	1,643,328.57	0.00	0.00	1,643,328.57	610,886.99	23,628,223.29	
			0.909090909				1.00		
		PRECIOS SOCIALES	1,493,935.06			1,493,935.06	610,886.99		19,864,276.68

PRESUPUESTO A PRECIOS PRIVADOS/SOCIALES (Sistema de Riego)

				Estudios	obras de infraestructura						
Categoria					Costo IR	Manejo Ambienta	Gastos Generale	Gastos de Super	subtotal	Utilidades	IMP.RENTA	TOTAL
Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 4-A												
No	Symbol	NOMBRE DEL PROYECTO		Estudios	Costo IR	Manejo Ambienta	Gastos Generale	Gastos de Super	subtotal	Utilidades	IMP.RENTA	TOTAL
1	AMA-1	Mejoramiento del Sist. Riego Higuerones-San Pedro	0.01409449	25,210.00	1,768,021.00	4,454.00	59,086.00	182,707.37	2,014,268.37	201,426.84	60,428.05	2,276,123.26
2	AMA-3	Mejoramiento Bocatoma y Canal Limonyacu Bajo	0.01073147	16,807.00	1,346,161.00	3,361.00	56,689.00	139,112.34	1,545,323.34	154,532.33	46,359.70	1,746,215.37
3	AMA-4	Mejoramiento del Sistema de Riego Utcuchillo - Canal Aventurero	0.01070643	16,807.00	1,343,021.00	3,361.00	35,884.00	138,787.85	1,521,053.85	152,105.39	45,631.62	1,718,790.85
4	AMA-5	Mejoramiento del Sistema de Riego Naranjitos - Canal Naranjitios N°. 02	0.00702489	14,790.00	881,206.00	2,185.00	44,060.00	91,063.87	1,018,514.87	101,851.49	30,555.45	1,150,921.80
6	AMA-9	Mej.Boc.Rev.Tramo Canal Comunal Huarangopampa	0.01007378	25,210.00	1,263,660.00	3,193.00	58,903.00	130,586.68	1,456,342.68	145,634.27	43,690.28	1,645,667.23
7	AMA-10	Mejoramiento del Sistema de Riego Lumbay Balsas	0.00867629	12,605.00	1,088,358.00	2,773.00	24,260.00	112,470.97	1,227,861.97	122,786.20	36,835.86	1,387,484.02
8	AMA-11	Mejoramiento del Sistema de Riego Naranjos - Canal Naranjos	0.01159847	16,807.00	1,454,918.00	3,697.00	58,675.00	150,351.29	1,667,641.29	166,764.13	50,029.24	1,884,434.66
9	AMA-12	Mejoramiento del Sistema de Riego El Pintor - Canal Abad.	0.00763287	12,605.00	957,472.00	2,437.00	47,874.00	98,945.20	1,106,728.20	110,672.82	33,201.85	1,250,602.87
10	AMA-13	Mejoramiento Canal San Roque Watson	0.00792739	16,807.00	994,416.00	2,521.00	42,903.00	102,762.99	1,142,602.99	114,260.30	34,278.09	1,291,141.38
11	AMA-14	Mejoramiento Canal Riego La Peca Baja - Canal Brujopata	0.00830179	21,008.00	1,041,381.00	2,605.00	52,911.00	107,616.36	1,204,513.36	120,451.34	36,135.40	1,361,100.10
13	ANC-12	Mejoramiento Canal Rurec	0.01498665	33,613.00	1,879,934.04	5,210.00	89,871.00	194,272.47	2,169,287.51	216,928.75	65,078.63	2,451,294.89
15	AYA-6	Irrigacion Papatapruna - Ccochalia	0.01477463	8,403.00	1,853,338.00	4,706.00	22,068.00	191,524.03	2,071,636.03	207,163.60	62,149.08	2,340,948.72
16	AYA-9	Mej y Const. Sistema Riego Putacca Ccatun Pampa	0.00815448	13,143.00	1,022,903.00	2,605.00	43,435.00	105,706.84	1,174,649.84	117,464.98	35,239.50	1,327,354.32
19	HUANCA	Irrigación Cusicancha-Huayacundo-Arma-Huaytará.	0.01043124	10,084.00	1,308,500.00	3,277.00	42,144.00	135,220.45	1,489,141.45	148,914.14	44,674.24	1,682,729.84
20	HUA-1	Construcción Canal de Riego Caracocha	0.01107129	23,361.00	1,388,789.00	3,529.00	66,631.00	143,517.52	1,602,466.52	160,246.65	48,074.00	1,810,787.17
21	HUA-2	Construcción Canal de Riego Sogoragra Rondobamba	0.00962292	8,403.00	1,207,104.00	3,025.00	10,918.00	124,742.18	1,345,789.18	134,578.92	40,373.68	1,520,741.78
22	JUNIN-1	Mejoramiento Canal Achamayo	0.00900878	21,008.00	1,130,066.00	2,857.00	80,779.00	116,781.07	1,330,483.07	133,048.31	39,914.49	1,503,445.87
24	LIB-1	Mejoramiento del Canal Sute Pututе	0.01091896	39,378.00	1,369,681.00	3,445.00	126,333.00	141,542.90	1,641,001.90	164,100.19	49,230.06	1,854,332.14
26	LIB-4	Mejor. Canal Riego Chuquitanqui-Shushipe	0.0155878	56,216.00	1,955,342.00	4,958.00	183,906.00	202,065.13	2,346,271.13	234,627.11	70,388.13	2,651,286.38
28	PIU-1	Canal de Irrigación Espindola	0.00856413	18,067.00	1,074,289.00	2,689.00	53,714.00	111,017.07	1,241,709.07	124,170.91	37,251.27	1,403,131.25
30	PIU-4	Mejoramiento Canal Chantaco Huaricanche	0.0078271	16,471.00	981,836.00	2,437.00	98,184.00	101,462.98	1,183,919.98	118,392.00	35,517.60	1,337,829.57
7	ANC-4	Construcción Canal Rupawasi - Rosamonte	0.01222321	42,017.00	1,364,323.63	5,210.00	205,056.00	140,989.27	1,715,578.90	171,557.89	51,467.37	1,938,604.15
		GRAND TOTAL		468,820.00	28,674,719.67	74,535.00	1,504,284.00	2,963,246.83	33,216,785.50	3,321,678.55	996,503.57	37,534,967.62
				0.909090909	0.840336134	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES		426,200.00	24,096,403.08	67,759.09	1,367,530.91	2,693,860.76	28,225,553.84	2,822,555.38	0.00	31,048,109.23

Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 4-B

No	Symbol	NOMBRE DEL PROYECTO		Estudios	Costo IR	Manejo Ambienta	Gastos Generale	Gastos de Super	subtotal	Utilidades	IMP.RENTA	TOTAL
1	ANC-19	Sistema de Riego Mancan Aija	0.01583652	46,050.00	1,828,217.00	4,622.00	91,411.00	188,928.03	2,113,178.03	211,317.80	63,395.34	2,387,891.17
2	AYA-2	Construcción Sistema de Riego Ccocha-Huayllay	0.01756504	21,008.00	2,027,763.00	5,630.00	81,149.00	209,549.12	2,324,091.12	232,409.11	69,722.73	2,626,222.97
4	JUNIN-2	Irrigación Aywin	0.01618854	49,664.00	1,868,855.00	4,958.00	180,936.00	193,127.56	2,247,876.56	224,787.66	67,436.30	2,540,100.51
5	LIB-6	Represa Laguna Negra-Const Canal de Riego Chugay	0.01303673	43,269.00	1,505,000.00	3,782.00	139,649.00	155,526.77	1,803,957.77	180,395.78	54,118.73	2,038,472.28
		GRAND TOTAL		159,991.00	7,229,835.00	18,992.00	493,145.00	747,131.48	8,489,103.48	848,910.35	254,673.10	9,592,686.93
				0.909090909	0.840336134	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES		145,446.36	6,075,491.60	17,265.45	448,313.64	679,210.43	7,220,281.12	722,028.11	0.00	7,942,309.23

Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 5

No	Symbol	NOMBRE DEL PROYECTO		Estudios	Costo IR	Manejo Ambienta	Gastos Generale	Gastos de Super	subtotal	Utilidades	IMP.RENTA	TOTAL
1	AMA-8	Mejoramiento del Sistema de Riego Goncha Morerilla - Canal Gonchillo Bajo	0.00439419	12,605.00	528,350.00	1,345.00	29,013.00	54,599.71	613,307.71	61,330.77	18,399.23	693,037.72
2	ANC-2	Mejoramiento del Canal de Irrigacion Paron II	0.00578913	12,689.00	696,075.77	1,765.00	69,608.00	71,932.50	839,381.28	83,938.13	25,181.44	948,500.84
3	ANC-6	Mej. Y Ampioacion del Canal de Irrigacion Quishquipachan	0.00607302	12,269.00	730,210.00	1,849.00	36,511.00	75,459.93	844,029.93	84,402.99	25,320.90	953,753.83
4	ANC-9	Mejoramiento del Canal de Riego Quinta Toma	0.00328987	6,639.00	395,569.00	1,008.00	47,217.00	40,878.12	484,672.12	48,467.21	14,540.16	547,679.49
5	ANC-20	Canal de Irrigación Desembocadero – San Miguel	0.00408482	12,605.00	491,152.00	1,261.00	49,116.00	50,755.67	592,284.67	59,228.47	17,768.54	669,281.68
6	CAJ-6	Construccion Canal La Samana - Ushusqui	0.00493524	10,000.00	593,405.00	1,513.00	59,340.00	61,322.50	715,580.50	71,558.05	21,467.41	808,605.96
8	JUNIN-4	Mejoramiento canal Ranra Antabamba	0.00178154	5,252.00	214,210.00	504.00	8,575.00	22,136.47	245,425.47	24,542.55	7,362.76	277,330.78
9	JUNIN-5	Mejoramiento Canal Sector Atocsaico	0.00583709	10,084.00	701,842.00	1,765.00	35,092.00	72,528.38	811,227.38	81,122.74	24,336.82	916,686.94
10	JUNIN-9	Mejoramiento Canal Mayuhuato - Huaracaya	0.00217431	4,370.00	261,435.00	672.00	13,072.00	27,016.70	302,195.70	30,219.57	9,065.87	341,481.15
11	JUNIN-1	Canal de Riego Ninatambo	0.0034081	6,891.00	409,784.00	1,008.00	20,489.00	42,347.10	473,628.10	47,362.81	14,208.84	535,199.75
12	PIU-2	Mejoramiento Canal Sanguly	0.00470795	9,496.00	566,076.00	1,429.00	56,608.00	58,498.32	682,611.32	68,261.13	20,478.34	771,350.79
		GRAND TOTAL		102,900.00	5,588,108.77	14,119.00	424,641.00	577,475.41	6,604,344.19	660,434.42	198,130.33	7,462,908.93
				0.909090909	0.840336134	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES		93,545.45	4,695,889.73	12,835.45	386,037.27	524,977.65	5,619,740.10	561,974.01	0.00	6,181,714.11

PRESUPUESTO A PRECIOS PRIVADOS/SOCIALES (Sistema de Riego)

			capacitacion						
Categoria			PRT	Capacitación	Conformacion de Comites	subtotal	Utilidades	IMP.RENTA	TOTAL
Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 4-A									
No	Symbol	NOMBRE DEL PROYECTO	PRT	Capacitación	Conformacion de Cor	subtotal	Utilidades	IMP.RENTA	TOTAL
1	AMA-1	Mejoramiento del Sist. Riego Higuerones-San Pedro	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
2	AMA-3	Mejoramiento Bocatoma y Canal Limonyacu Bajo	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
3	AMA-4	Mejoramiento del Sistema de Riego Utcuchillo - Canal Aventurero	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
4	AMA-5	Mejoramiento del Sistema de Riego Naranjitos - Canal Naranjitios N°. 02	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
6	AMA-9	Mej.Boc.Rev.Tramo Canal Comunal Huarangopampa	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
7	AMA-10	Mejoramiento del Sistema de Riego Lumbay Balsas	33,770.00	4,202.00	619.05	38,591.05	3,859.10	1,157.73	43,607.88
8	AMA-11	Mejoramiento del Sistema de Riego Naranjos - Canal Naranjos	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
9	AMA-12	Mejoramiento del Sistema de Riego El Pintor - Canal Abad.	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
10	AMA-13	Mejoramiento Canal San Roque Watson	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
11	AMA-14	Mejoramiento Canal Riego La Peca Baja - Canal Brujopata	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
13	ANC-12	Mejoramiento Canal Rurec	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
15	AYA-6	Irrigacion Papatapruna - Ccochalla	16,885.00	1,681.00	619.05	19,185.05	1,918.50	575.55	21,679.10
16	AYA-9	Mej y Const. Sistema Riego Putacca Ccatun Pampa	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
19	HUANCA	Irrigación Cusicancha-Huayacundo-Arma-Huaytará.	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
20	HUA-1	Construcción Canal de Riego Caracocha	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
21	HUA-2	Construcción Canal de Riego Sogoragra Rondobamba	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
22	JUNIN-1	Mejoramiento Canal Achamayo	101,310.00	8,403.00	619.05	110,332.05	11,033.20	3,309.96	124,675.21
24	LIB-1	Mejoramiento del Canal Sute Pututce	16,885.00	8,403.00	619.05	25,907.05	2,590.70	777.21	29,274.96
26	LIB-4	Mejor. Canal Riego Chuquillanqui-Shushipe	16,885.00	8,403.00	619.05	25,907.05	2,590.70	777.21	29,274.96
28	PIU-1	Canal de Irrigación Espindola	16,885.00	4,202.00	619.05	21,706.05	2,170.60	651.18	24,527.83
30	PIU-4	Mejoramiento Canal Chantaco Huaricanche	67,540.00	8,218.00	619.05	76,377.05	7,637.70	2,291.31	86,306.06
7	ANC-4	Construcción Canal Rupawasi - Rosamonte	101,310.00	20,168.00	1,300.00	122,778.00	12,277.80	3,683.34	138,739.14
		GRAND TOTAL	607,860.00	122,508.00	14,300.00	744,668.00	74,466.80	22,340.04	841,474.84
			0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	552,600.00	111,370.91	13,000.00	676,970.91	67,697.09	0.00	744,668.00

Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 4-B

No	Symbol	NOMBRE DEL PROYECTO	PRT	Capacitación	Conformacion de Cor	subtotal	Utilidades	IMP.RENTA	TOTAL
1	ANC-19	Sistema de Riego Mancan Alja	33,770.00	8,403.00	1,500.00	43,673.00	4,367.30	1,310.19	49,350.49
2	AYA-2	Construcción Sistema de Riego Ccocha-Huayllay	33,770.00	4,202.00	1,500.00	39,472.00	3,947.20	1,184.16	44,603.36
4	JUNIN-2	Irrigación Aywin	84,425.00	8,403.00	1,500.00	94,328.00	9,432.80	2,829.84	106,590.64
5	LIB-6	Represa Laguna Negra-Const Canal de Riego Chugay	16,885.00	8,403.00	1,500.00	26,788.00	2,678.80	803.64	30,270.44
		GRAND TOTAL	168,850.00	29,411.00	6,000.00	204,261.00	20,426.10	6,127.83	230,814.93
			0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	153,500.00	26,737.27	5,454.55	185,691.82	18,569.18	0.00	204,261.00

Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 5

No	Symbol	NOMBRE DEL PROYECTO	PRT	Capacitación	Conformacion de Cor	subtotal	Utilidades	IMP.RENTA	TOTAL
1	AMA-8	Mejoramiento del Sistema de Riego Goncha Morerilla - Canal Gonchillo Bajo	16,885.00	4,202.00	272.73	21,359.73	2,135.97	640.79	24,136.49
2	ANC-2	Mejoramiento del Canal de Irrigacion Paron II	33,770.00	16,807.00	272.73	50,849.73	5,084.97	1,525.49	57,460.19
3	ANC-6	Mej. Y Amploacion del Canal de Irrigacion Quishquipachan	16,885.00	8,403.00	272.73	25,560.73	2,556.07	766.82	28,883.62
4	ANC-9	Mejoramiento del Canal de Riego Quinta Toma	16,885.00	8,403.00	272.73	25,560.73	2,556.07	766.82	28,883.62
5	ANC-20	Canal de Irrigación Desembocadero – San Miguel	16,885.00	8,403.00	272.73	25,560.73	2,556.07	766.82	28,883.62
6	CAJ-6	Construccion Canal La Samana - Ushusqui	16,885.00	4,202.00	272.73	21,359.73	2,135.97	640.79	24,136.49
8	JUNIN-4	Mejoramiento canal Ranra Antabamba	16,885.00	4,202.00	272.73	21,359.73	2,135.97	640.79	24,136.49
9	JUNIN-5	Mejoramiento Canal Sector Atocsaico	50,655.00	4,202.00	272.73	55,129.73	5,512.97	1,653.89	62,296.59
10	JUNIN-9	Mejoramiento Canal Mayuhuato - Huaracaya	16,885.00	4,202.00	272.73	21,359.73	2,135.97	640.79	24,136.49
11	JUNIN-1	Canal de Riego Ninatambo	16,885.00	4,202.00	272.73	21,359.73	2,135.97	640.79	24,136.49
12	PIU-2	Mejoramiento Canal Sanguly	33,770.00	4,202.00	272.73	38,244.73	3,824.47	1,147.34	43,216.54
		GRAND TOTAL	253,275.00	71,430.00	3,000.00	327,705.00	32,770.50	9,831.15	370,306.65
			0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	230,250.00	64,936.36	2,727.27	297,913.64	29,791.36	0.00	327,705.00

PRESUPUESTO A PRECIOS PRIVADOS/SOCIALES (Sistema de Riego)

			fortalecimiento de productores							
Categoría			organización de Produ	estudio de mercado	estudio de deb. CP	SUPERVISOR	SUB TOTAL	Utilidades	IMP.RENTA	TOTAL
Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 4-A										
No	Symbol	NOMBRE DEL PROYECTO	organización de Produ	estudio de mercado	estudio de deb. CP	ESPECIALISTA	SUB TOTAL	Utilidades	IMP.RENTA	TOTAL
1	AMA-1	Mejoramiento del Sist. Riego Higuerones-San Pedro	4,112.79	15,000.00	17,000.00	5,538.46	41,651.25	4,165.13	1,249.54	47,065.92
2	AMA-3	Mejoramiento Bocatoma y Canal Limonyacu Bajo	4,112.79	15,000.00	17,000.00	5,538.46	41,651.25	4,165.13	1,249.54	47,065.92
3	AMA-4	Mejoramiento del Sistema de Riego Utcuchillo - Canal Aventurero	4,112.79	15,000.00	17,000.00	5,538.46	41,651.25	4,165.13	1,249.54	47,065.92
4	AMA-5	Mejoramiento del Sistema de Riego Naranjitos - Canal Naranjitos N°. 02	4,112.79	15,000.00	17,000.00	5,538.46	41,651.25	4,165.13	1,249.54	47,065.92
6	AMA-9	Mej.Boc.Rev.Tramo Canal Comunal Huarangopampa	4,112.79	15,000.00	17,000.00	5,538.46	41,651.25	4,165.13	1,249.54	47,065.92
7	AMA-10	Mejoramiento del Sistema de Riego Lumbay Balsas	12,338.38	15,000.00	17,000.00	5,538.46	49,876.84	4,987.68	1,496.31	56,360.83
8	AMA-11	Mejoramiento del Sistema de Riego Naranjos - Canal Naranjos	8,225.58	15,000.00	17,000.00	5,538.46	45,764.04	4,576.40	1,372.92	51,713.37
9	AMA-12	Mejoramiento del Sistema de Riego El Pintor - Canal Abad.	4,112.79	15,000.00	17,000.00	5,538.46	41,651.25	4,165.13	1,249.54	47,065.92
10	AMA-13	Mejoramiento Canal San Roque Watson	8,225.58	15,000.00	17,000.00	5,538.46	45,764.04	4,576.40	1,372.92	51,713.37
11	AMA-14	Mejoramiento Canal Riego La Peca Baja - Canal Brujopata	4,112.79	15,000.00	17,000.00	5,538.46	41,651.25	4,165.13	1,249.54	47,065.92
13	ANC-12	Mejoramiento Canal Rurec	8,225.58	15,000.00	17,000.00	6,857.14	47,082.73	4,708.27	1,412.48	53,203.48
15	AYA-6	Irrigacion Papatapruna - Ccochalla	4,112.79	15,000.00	17,000.00	6,857.14	42,969.93	4,296.99	1,289.10	48,556.03
16	AYA-9	Mej y Const. Sistema Riego Putacca Ccatun Pampa	8,225.58	15,000.00	17,000.00	6,857.14	47,082.73	4,708.27	1,412.48	53,203.48
19	HUANC/	Irrigación Cusicancha-Huayacundo-Arma-Huaytará.	4,112.79	15,000.00	17,000.00	8,000.00	44,112.79	4,411.28	1,323.38	49,847.45
20	HUA-1	Construcción Canal de Riego Caracocha	4,112.79	15,000.00	17,000.00	8,000.00	44,112.79	4,411.28	1,323.38	49,847.45
21	HUA-2	Construcción Canal de Riego Sogoragra Rondobamba	8,225.58	15,000.00	17,000.00	8,000.00	48,225.58	4,822.56	1,446.77	54,494.91
22	JUNIN-1	Mejoramiento Canal Achamayo	37,015.13	15,000.00	17,000.00	5,333.33	74,348.46	7,434.85	2,230.45	84,013.76
24	LIB-1	Mejoramiento del Canal Sute Pututе	8,225.58	15,000.00	17,000.00	8,000.00	48,225.58	4,822.56	1,446.77	54,494.91
26	LIB-4	Mejor. Canal Riego Chuquillanqui-Shushipe	8,225.58	15,000.00	17,000.00	8,000.00	48,225.58	4,822.56	1,446.77	54,494.91
28	PIU-1	Canal de Irrigación Espíndola	8,225.58	15,000.00	17,000.00	8,000.00	48,225.58	4,822.56	1,446.77	54,494.91
30	PIU-4	Mejoramiento Canal Chantaco Huaricanche	24,676.75	15,000.00	17,000.00	8,000.00	64,676.75	6,467.68	1,940.30	73,084.73
7	ANC-4	Construcción Canal Rupawasi - Rosamonte	57,579.08	15,000.00	17,000.00	6,857.14	96,436.23	9,643.62	2,893.09	108,972.94
		GRAND TOTAL	238,541.92	330,000.00	374,000.00	144,146.52	1,086,688.44	108,668.84	32,600.65	1,227,957.93
			0.909090909	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	216,856.29	300,000.00	340,000.00	131,042.29	987,898.58	98,789.86	0.00	1,086,688.44

Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 4-B

No	Symbol	NOMBRE DEL PROYECTO	organización de Produ	estudio de mercado	estudio de deb. CP	ESPECIALISTA	SUB TOTAL	Utilidades	IMP.RENTA	TOTAL
1	ANC-19	Sistema de Riego Mancan Aija	12,338.38	15,000.00	17,000.00	6,857.14	51,195.52	5,119.55	1,535.87	57,850.94
2	AYA-2	Construcción Sistema de Riego Ccocha-Huayllay	16,451.17	15,000.00	17,000.00	6,857.14	55,308.31	5,530.83	1,659.25	62,498.39
4	JUNIN-2	Irrigación Aywin	32,902.33	15,000.00	17,000.00	5,333.33	70,235.67	7,023.57	2,107.07	79,366.30
5	LIB-6	Represa Laguna Negra-Const Canal de Riego Chugay	8,225.58	15,000.00	17,000.00	8,000.00	48,225.58	4,822.56	1,446.77	54,494.91
		GRAND TOTAL	69,917.46	60,000.00	68,000.00	27,047.62	224,965.08	22,496.51	6,748.95	254,210.54
			0.909090909	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	63,561.33	54,545.45	61,818.18	24,588.74	204,513.71	20,451.37	0.00	224,965.08

Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 5

No	Symbol	NOMBRE DEL PROYECTO	organización de Produ	estudio de mercado	estudio de deb. CP	ESPECIALISTA	SUB TOTAL	Utilidades	IMP.RENTA	TOTAL
1	AMA-8	Mejoramiento del Sistema de Riego Goncha Morerilla - Canal Gonchillo Bajo	4,112.79	15,000.00	17,000.00	5,538.46	41,651.25	4,165.13	1,249.54	47,065.92
2	ANC-2	Mejoramiento del Canal de Irrigacion Paron II	12,338.38	15,000.00	17,000.00	6,857.14	51,195.52	5,119.55	1,535.87	57,850.94
3	ANC-6	Mej. Y Amploacion del Canal de Irrigacion Quishquipachan	4,112.79	15,000.00	17,000.00	6,857.14	42,969.93	4,296.99	1,289.10	48,556.03
4	ANC-9	Mejoramiento del Canal de Riego Quinta Toma	4,112.79	15,000.00	17,000.00	6,857.14	42,969.93	4,296.99	1,289.10	48,556.03
5	ANC-20	Canal de Irrigación Desembocadero – San Miguel	8,225.58	15,000.00	17,000.00	6,857.14	47,082.73	4,708.27	1,412.48	53,203.48
6	CAJ-6	Construccion Canal La Samana - Ushusqui	12,338.38	15,000.00	17,000.00	6,000.00	50,338.38	5,033.84	1,510.15	56,882.36
8	JUNIN-4	Mejoramiento canal Ranra Antabamba	4,112.79	15,000.00	17,000.00	5,333.33	41,446.13	4,144.61	1,243.38	46,834.12
9	JUNIN-5	Mejoramiento Canal Sector Atocsaico	20,563.96	15,000.00	17,000.00	5,333.33	57,897.29	5,789.73	1,736.92	65,423.94
10	JUNIN-9	Mejoramiento Canal Mayuhuato - Huaracaya	8,225.58	15,000.00	17,000.00	5,333.33	45,558.92	4,555.89	1,366.77	51,481.58
11	JUNIN-1	Canal de Riego Ninatambo	4,112.79	15,000.00	17,000.00	5,333.33	41,446.13	4,144.61	1,243.38	46,834.12
12	PIU-2	Mejoramiento Canal Sanguly	16,451.17	15,000.00	17,000.00	8,000.00	56,451.17	5,645.12	1,693.54	63,789.82
		GRAND TOTAL	98,707.00	165,000.00	187,000.00	68,300.37	519,007.37	51,900.74	15,570.22	586,478.32
			0.909090909	0.909090909	0.909090909	0.909090909				
		PRECIOS SOCIALES	89,733.64	150,000.00	170,000.00	62,091.24	471,824.88	47,182.49	0.00	519,007.37

PRESUPUESTO A PRECIOS PRIVADOS/SOCIALES (Sistema de Riego)

			Asistencia Tecnica				CANALES LATERALES		
Categoria			asistencia tecnica	Utilidades	IMP.RENTA	TOTAL		Precio Privado S/.	Precio Social S/.
Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 4-A									(S./)
No	Symbol	NOMBRE DEL PROYECTO	asistencia tecnica	Utilidades	IMP.RENTA	TOTAL		Precio Privado	Precio Social
1	AMA-1	Mejoramiento del Sist. Riego Higuerones-San Pedro	88,828.57			88,828.57		2,461,755.58	
2	AMA-3	Mejoramiento Bocatoma y Canal Limonyacu Bajo	44,414.29			44,414.29		1,879,030.41	
3	AMA-4	Mejoramiento del Sistema de Riego Utcuchillo - Canal Aventurero	88,828.57			88,828.57		1,896,020.17	
4	AMA-5	Mejoramiento del Sistema de Riego Naranjitos - Canal Naranjitos N°. 02	0.00			0.00		1,237,305.55	
6	AMA-9	Mej.Boc.Rev.Tramo Canal Comunal Huarangopampa	44,414.29			44,414.29		1,786,885.27	
7	AMA-10	Mejoramiento del Sistema de Riego Lumbay Balsas	44,414.29			44,414.29		1,544,472.02	
8	AMA-11	Mejoramiento del Sistema de Riego Naranjos - Canal Naranjos	44,414.29			44,414.29		2,021,897.15	
9	AMA-12	Mejoramiento del Sistema de Riego El Pintor - Canal Abad.	44,414.29			44,414.29		1,379,215.90	
10	AMA-13	Mejoramiento Canal San Roque Watson	88,828.57			88,828.57		1,473,018.16	
11	AMA-14	Mejoramiento Canal Riego La Peca Baja - Canal Brujopata	44,414.29			44,414.29		1,498,116.13	
13	ANC-12	Mejoramiento Canal Rurec	266,485.71			266,485.71	19,423.89	2,848,548.80	
15	AYA-6	Irrigacion Papatapruna - Ccochalla	177,657.14			177,657.14	104,087.03	2,701,331.02	
16	AYA-9	Mej y Const. Sistema Riego Putacca Ccatun Pampa	133,242.86			133,242.86	23,600.00	1,575,071.49	
19	HUANCA	Irrigación Cusicancha-Huayacundo-Arma-Huaytará.	88,828.57			88,828.57	95,007.17	1,951,024.87	
20	HUA-1	Construcción Canal de Riego Caracocha	88,828.57			88,828.57	39,293.07	2,036,645.10	
21	HUA-2	Construcción Canal de Riego Sogoragra Rondobamba	177,657.14			177,657.14	35,182.52	1,821,007.18	
22	JUNIN-1	Mejoramiento Canal Achamayo	0.00			0.00		1,733,142.84	
24	LIB-1	Mejoramiento del Canal Sute Pututе	222,071.43			222,071.43	93,576.10	2,293,127.54	
26	LIB-4	Mejor. Canal Riego Chuquillanqui-Shushipe	0.00			0.00		2,791,272.25	
28	PIU-1	Canal de Irrigación Espindola	222,071.43			222,071.43	94,638.60	1,816,931.03	
30	PIU-4	Mejoramiento Canal Chantaco Huaricanche	266,485.71			266,485.71	215,461.10	1,995,638.18	
7	ANC-4	Construcción Canal Rupawasi - Rosamonte	266,485.71			266,485.71	112,348.08	2,607,167.02	
		GRAND TOTAL	2,442,785.71	0.00	0.00	2,442,785.71	832,617.56	43,348,623.67	0.00
			0.909090909				1.00		
		PRECIOS SOCIALES	2,220,714.29			2,220,714.29	832,617.56		36,358,997.51
Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 4-B									(S./)
No	Symbol	NOMBRE DEL PROYECTO	asistencia tecnica	Utilidades	IMP.RENTA	TOTAL		Precio Privado	Precio Social
1	ANC-19	Sistema de Riego Mancan Aija	222,071.43			222,071.43	29,550.69	2,792,764.72	
2	AYA-2	Construcción Sistema de Riego Ccocha-Huayllay	177,657.14			177,657.14	184,599.11	3,116,588.97	
4	JUNIN-2	Irrigación Aywin	177,657.14			177,657.14	119,471.44	3,072,850.04	
5	LIB-6	Represa Laguna Negra-Const Canal de Riego Chugay	133,242.86			133,242.86		2,299,749.48	
		GRAND TOTAL	710,628.57	0.00	0.00	710,628.57	333,621.24	11,281,953.21	0.00
			0.909090909				1.00		
		PRECIOS SOCIALES	646,025.97			646,025.97	333,621.24		9,496,628.89
Lista de Subproyectos: Congromerado "Infraestructure de Riego" TIPO 5									(S./)
No	Symbol	NOMBRE DEL PROYECTO	asistencia tecnica	Utilidades	IMP.RENTA	TOTAL		Precio Privado	Precio Social
1	AMA-8	Mejoramiento del Sistema de Riego Goncha Morerilla - Canal Gonchillo Bajo	0.00			0.00		776,845.12	
2	ANC-2	Mejoramiento del Canal de Irrigacion Paron II	44,414.29			44,414.29	3,178.60	1,124,093.85	
3	ANC-6	Mej. Y Amploacion del Canal de Irrigacion Quishquipachan	44,414.29			44,414.29		1,087,876.76	
4	ANC-9	Mejoramiento del Canal de Riego Quinta Toma	0.00			0.00		631,758.14	
5	ANC-20	Canal de Irrigación Desembocadero – San Miguel	44,414.29			44,414.29		808,388.07	
6	CAJ-6	Construccion Canal La Samana - Ushusqui	177,657.14			177,657.14	42,471.68	1,119,753.64	
8	JUNIN-4	Mejoramiento canal Ranra Antabamba	0.00			0.00		353,553.40	
9	JUNIN-5	Mejoramiento Canal Sector Atocsaico	0.00			0.00		1,054,491.48	
10	JUNIN-9	Mejoramiento Canal Mayuhuato - Huaracaya	0.00			0.00		421,469.21	
11	JUNIN-1	Canal de Riego Ninatambo	0.00			0.00		613,061.36	
12	PIU-2	Mejoramiento Canal Sanguly	177,657.14			177,657.14	74,207.78	1,139,718.07	
		GRAND TOTAL	488,557.14	0.00	0.00	488,557.14	119,858.06	9,131,009.11	0.00
			0.909090909				1.00		
		PRECIOS SOCIALES	444,142.86			444,142.86	119,858.06		7,685,972.85

PRESUPUESTO A PRECIOS PRIVADOS (Riego Tecnificado)

PRESUPUESTOS GENERAL DE PROYECTO A COSTOS PRIVADOS

DESCRICPION	Unidad de Medida	RESUMEN DE COSTOS		CRONOGRAMA DE INVERSIONES A PRECIOS PRIVADOS				
		Cant	sub. Tot	2,010	2,011	2,012	2,013	2,014
Componente 1. Caracterizacion de los Recursos hídricos de la microcuenca			6,603,568					
- Identificacion de Disponibilidad de Recursos Hidricos y Zonas de Intensificacion productiva / analisis de conflictos	ESTUDIO	50	6,603,568		6,603,568			
Componente 2 . Comité de Gestion de Recursos Hídricos de Microcuenca conformado y fortalecido realiza acciones de manejo de los recursos hídricos y *productivos*			10,921,682					
2.1. Sensibilización para el manejo de los RRHH en microcuencas			954,655		954,655			
Reuniones de Sensibilizacion principal con autoridades y representantes de las organizaciones de base	EVENTO	50	216,665					
Reuniones de Sensibilizacion secundaria con representantes de las orgnizaciones campesinas	EVENTO	50	145,828					
Difusion de Spots radio televisivos	SPOT	50	65,000					
Difusion afiches informativos	PAQUETE	50	215,000					
Visitas de reconocimiento de la microcuenca	EVENTO	100	312,162					
2.2. Organización para la conformación y formalizacion del comité de gestion de RRHH de microcuenca			1,356,078			1,356,078		
Actividades de capacitacion (charlas, cursos, talleres)	EVENTO	160	553,578					
Formalización del comité de gestion de RRHH de microcuenca								
- Elaboracion del Reglamento	EVENTO	50	141,220					
- Elaboracion del Estatuto	EVENTO	50	141,220					
- Elaboracion del Plan Estrategico	EVENTO	50	166,220					
- Elaboracion del Plan Operativo	EVENTO	50	166,220					
- Tramites Registrales	EVENTO	50	187,622					
2.3. Acciones de Gestion del comité de RRHH de microcuenca			2,115,446				2,115,446	
- Talleres participativos de capacitacion	EVENTO	150	734,757					
- Visitas a otras experiencias con mejores resultados	EVENTO	50	860,095					
- Dias de Campo - acciones de conservacion	EVENTO	100	520,595					
2.4. Equipamiento para el Monitoreo de los Recursos Hídricos y Meteorológicos			5,141,935		5,141,935			
- Instalcion de equipos para el monitoreo meteorológico / y capacitacion para la operación	ESTACION	50	2,488,368					
- Instalcion de equipos para el monitoreo hidrológico / y capacitacion para la operación	ESTACION	50	2,653,568					
2.5. Recuperando Saberes			1,353,568					1,353,568
- Sistematizacion de principales experiencias	DOCUMENT	50	451,784					
- Publicacion de principales experiencias	MILLAR	50	901,784					
0			469,000					
Elaboracion de Expediente tecnico del componente B	Documento	50	469,000	469,000				
SUB TOTAL		**TOTAL**	**17,994,250**	**469,000**	**12,700,158**	**1,356,078**	**2,115,446**	**1,353,568**

*1. Los módulos de capacitacion incluyen (Cursos, Talleres, Charlas)
*2. Se considera la contratacion de un resposable de proyecto que tendra a cargo la direccion y conduccion de las actividades programas en el PIP. En total 13 coordinadores
Ver anexo de distribucion de coordinadores según cantidad de microcuencas
*3. Ver anexo de clasificacion de cuencas por tamaño
*4. El formento de la asociatividad se hara por cada proyecto individual

PRESUPUESTO A PRECIOS PRIVADOS (Riego Tecnificado)

PRESUPUESTOS GENERAL DE PROYECTO A PRACIOS SOCIALES

DESCRICPION	Unidad de Medida	RESUMEN SIN PROMOTOR		CRONOGRAMA DE INVERSIONES A PRECIOS SOCIALES				
		Cant	sub. Tot	2,010	2,011	2,012	2,013	2,014
Componente 1. Caracterizacion de los Recursos hidricos de la microcuenca			6,009,246					
- Identificacion de Disponibilidad de Recursos Hidricos y Zonas de Intensificacion productiva / analisis de conflictos	ESTUDIO	50	6,009,246		6,009,246			
Componente 2 . Comité de Gestion de Recursos Hídricos de Microcuenca conformado y fortalecido realiza acciones de manejo de los recursos hidricos y productivos			9,536,452					
2.1. Sensibilización para el manejo de los RRHH en microcuencas			845,479		845,479			
Reuniones de Sensibilizacion principal con autoridades y representantes de las organizaciones de base	EVENTO	50	194,645					
Reuniones de Sensibilizacion secundaria con representantes de las orgnizaciones campesinas	EVENTO	50	130,026					
Difusion de Spots radio televisivos	SPOT	50	59,150					
Difusion afiches informativos	MILLAR	50	181,650					
Visitas de reconocimiento de la microcuenca	EVENTO	100	280,008					
2.2. Organización para la conformación y formalizacion del comité de gestion de RRHH de microcuenca			1,217,420			1,217,420		
Actividades de capacitacion (charlas, cursos, talleres)	EVENTO	160	495,300					
Formalización del comité de gestion de RRHH de microcuenca								
- Elaboracion del Reglamento	EVENTO	50	126,471					
- Elaboracion del Estatuto	EVENTO	50	126,471					
- Elaboracion del Plan Estrategico	EVENTO	50	149,221					
- Elaboracion del Plan Operativo	EVENTO	50	149,221					
- Tramites Registrales	EVENTO	50	170,736					
2.3. Acciones de Gestion del comité de RRHH de microcuenca			1,898,981				1,898,981	
- Talleres participativos de capacitacion	EVENTO	150	660,649					
- Visitas a otras experiencias con mejores resultados	EVENTO	50	782,371					
- Dias de Campo - acciones de conservacion	EVENTO	100	455,961					
2.4. Equipamiento para el Monitoreo de los Recursos Hídricos y Meteorológicos			4,395,325		4,395,325			
- Instalcion de equipos para el monitoreo metcorológico / y capacitacion para la operación	ESTACION	50	2,128,278					
- Instalcion de equipos para el monitoreo hidrológico / y capacitacion para la operación	ESTACION	50	2,267,046					
2.5. Recuperando Saberes			1,179,246					1,179,246
- Sistematizacion de principales experiencias	DOCUMENT	50	411,123					
- Publicacion de principales experiencias	MILLAR	50	768,123					
Gastos de complementarios de Administracion y Supervision			460,558					
Elaboracion de Expediente tecnico - especificaciones tecnicas - plan de capacitacion	Documento	50	460,558	460,558				
SUB TOTAL		**TOTAL**	**16,006,256**	**460,558**	**11,250,050**	**1,217,420**	**1,898,981**	**1,179,246**

*1. Los módulos de capacitacion incluyen (Cursos, Talleres, Charlas)
*2. Se considera la contratacion de un resposable de proyecto que tendra a cargo la direccion y conduccion de las actividades programas en el PIP. En total 13 coordinadores
Ver anexo de distribucion de coordinadores según cantidad de microcuencas
*3. Ver anexo de clasificacion de cuencas por tamaño
*4. El formento de la asociatividad se hara por cada proyecto individual

PRESUPUESTO DEL COMPONENTE B FORTALECMIMIENTO DE LA GESTION DE RECURSOS HIDRICOS EN MICROCUENCAS A PRECIOS PRIVADOS

DESCRICPION	RESUMEN PROYECTO			
	Unidad	Cant	CU. Prom	sub. Tot
Componente 1. Caracterizacion de los Recursos hídricos de la microcuenca				
- Identificacion de Disponibilidad de Recursos Hídricos y Zonas de Intensificacion productiva / analisis de conflictos	ESTUDIO	50	134,500	6,725,000
Componente 2 . Comité de Gestion de Recursos Hídricos de Microcuenca				**13,741,906**
2.1. Sensibilización para el manejo de los RRHH en microcuencas	MICROC	50	18,865	943,250
Reuniones de Sensibilizacion principal con autoridades y representantes de las organizaciones de base	EVENTO	50	3,000	150,000
Reuniones de Sensibilizacion secundaria con representantes de las orgnizaciones campesinas	EVENTO	50	2,865	143,250
Difusion de Spots radio televisivos	SPOT	50	1,800	90,000
Difusion afiches informativos	MILLAR	50	4,800	240,000
Visitas de reconocimiento de la microcuenca	EVENTO	100	3,200	320,000
2.2. Organización y formalizacion del comité de gestion de RRHH de microcuenca	MICROC	50	37,350	1,867,500
Actividades de capacitacion (charlas, cursos, talleres)	EVENTO	160	4,700	752,000
Formalización del comité de gestion de RRHH de microcuenca				
- Elaboracion del Reglamento	EVENTO	50	4,313	215,625
- Elaboracion del Estatuto	EVENTO	50	4,313	215,625
- Elaboracion del Plan Estrategico	EVENTO	50	4,813	240,625
- Elaboracion del Plan Operativo	EVENTO	50	4,813	240,625
- Tramites Registrales	EVENTO	50	4,060	203,000
2.3. Capacitacion del comité de Gestion de RRHH de microcuenca	MICROC	50	42,690	2,134,500
- Talleres participativos de capacitacion	EVENTO	150	3,700	555,000
- Visitas a otras experiencias con mejores resultados	EVENTO	50	17,190	859,500
- Dias de Campo - acciones de conservacion	EVENTO	100	7,200	720,000
2.4. Fomento de la asociatividad para la productividad	ASOC. PROD	56	52,530	2,941,656
- Organización de Productores	EVENTO	280	3,006	841,656
- Estudios de mercado	ESTUDIO	56	16,250	910,000
- Identificacion de las debilidades de la cadena productiva	ESTUDIO	56	21,250	1,190,000
2.5. Monitoreo de los Recursos Hídricos y climaticos	MICROC	50	95,100	4,755,000
- Instalacion de estaciones meteorológico y capacitacion para la operación	ESTACION	50	46,850	2,342,500
- Instalacion de la estacion hidrológica y capacitacion para la operación	ESTACION	50	48,250	2,412,500
2.6. Recuperando Saberes	MICROC	50	22,000	1,100,000
- Sistematizacion de principales experiencias	DOCUMENTO	50	6,500	325,000
- Publicacion de principales experiencias	MILLAR	50	15,500	775,000
Gastos de complementarios de Administracion y Supervision	**MICROC**	**50**	**15,300**	**765,000**
Elaboracion de Expediente tecnico - especificaciones tecnicas - plan de capacitacion	Documento	50	9,380	469,000
Supervisión técnica inter nacional / evaluacion final (tecnico economica)	Meses	8	37,000	296,000
SUB TOTAL	**TOTAL**			**21,231,906**

*1. Los módulos de capacitacion incluyen (Cursos, Talleres, Charlas)

*2. Se considera la contratacion de un resposable de proyecto que tendra a cargo la direccion y conduccion de las actividades programas en el PIP. En t Ver anexo de distribucion de coordinadores según cantidad de microcuencas

*3. Ver anexo de clasificacion de cuencas por tamaño

*4. El formento de la asociatividad se hara por cada proyecto individual

PRESUPUESTO DEL COMPONENTE C GESTION DEL PROGRAMA
COSTO DE ADMINISTRACION Y MONITOREO DEL PROGRAMA - SEDE CENTRAL

	DESCRIPCION	UNIDAD	CANT.	COSTO UNIT.	COSTO TOTAL PRECIO PRIV.	F.C	COSTO TOTAL PRECIO SOC.
I	**MAQUINARIA Y/O EQUIPO**						
	TRANSABLE						
	Equipo de cómputo	E.C.	11	4,500	49,500	0.84	41,597
	Camionetas 4x4 doble cabina	Vehículo	0	90,000	0	0.84	0
	Impresora+fotocopiadora	unid	2	8,000	16,000	0.84	13,445
	equipo multimedia	unid	2	6,000	12,000	0.84	10,084
II	**MATERIALES Y/O INSUMOS**						
	NO TRANSABLE						
	Utiles de oficina	Glob	1	36,000	36,000	0.84	30,251
	Combustible	Galón	30,816	12	369,792	0.66	244,063
	escritorios	unid	11	350	3,850	0.84	3,235
III	**MANO DE OBRA**						
	CALIFICADA						
	NO TRANSABLE						
	CALIFICADA						
	Coordinador del programa	M-H	60	12,000	720,000	0.909	654,545
	asistente del Coordinador	M-H	60	5,000	300,000	0.909	272,727
	Coordinar de infraestructura de riego	M-H	60	10,000	600,000	0.909	545,455
	Coordinar de cuencas	M-H	60	10,000	600,000	0.909	545,455
	monitoreo de infraestructura de riego	M-H	60	5,000	300,000	0.909	272,727
	monitoreo de cuencas	M-H	60	5,000	300,000	0.909	272,727
	Administrador	M-H	60	8,000	480,000	0.909	436,364
	contador	M-H	60	5,000	300,000	0.909	272,727
	tesorero	M-H	60	3,000	180,000	0.909	163,636
	especialista en adquisiciones	M-H	60	3,000	180,000	0.909	163,636
	Secretaria	M-H	60	3,000	180,000	0.909	163,636
	Chofer	M-H	120	2,000	240,000	0.909	218,182
IV	**SERVICIOS**						
	TRANSABLE						
	consultoria linea base	Global	1	450,000	450,000	0.909	409,091
	Evaluación externa expost Intermedia	Global	1	400,000	400,000	0.909	363,636
	Evaluación externa expost Final	Global	1	450,000	450,000	0.909	409,091
	NO TRANSABLE						
	Auditorias	Global	4	200,000	800,000	0.909	727,273
	gastos operativos	meses	60	500	30,000	0.84	25,209
						0.84	0
						0.84	0
						0.84	0
	Afinamiento	Número	174	40	6,960	0.84	5,848
	Lavado y engrase	Número	216	45	9,720	0.84	8,168
	SUBTOTAL				**7,013,822**		**6,272,809**

COSTO DE ADMINISTRACION -SEGUIMIENTO DEL PROGRAMA - 9 DIRECCIONES ZONALES							
	DESCRIPCION	UNIDAD	CANT.	COSTO UNIT.	COSTO TOTAL PRECIO PRIV.	F.C	COSTO TOTAL PRECIO SOC.
I	**MAQUINARIA Y/O EQUIPO**						
	TRANSABLE						
	Equipo de cómputo	E.C.	27	4,500	121,500	0.84	102,101
	Camionetas 4x4 doble cabina	Vehículo	0	90,000	0	0.84	0
	Impresora+fotocopiadora	unid	9	8,000	72,000	0.84	60,504
II	**MATERIALES Y/O INSUMOS**						
	NO TRANSABLE						
	Utiles de oficina	Global	1	363000	363,000	0.84	305,029
	Combustible (*)	Galón	524,009.40	12	6,288,113	0.66	4,150,154
	escritorios	unid	27	350	9,450	0.84	7,941
III	**MANO DE OBRA**						
	CALIFICADA						
	Coordinador del proyectos de programa	M-H	486	8,000	3,888,000	0.909	3,534,545
	Coordinar de cuencas	M-H	486	7,000	3,402,000	0.909	3,092,727
	Administrador	M-H	486	4,000	1,944,000	0.909	1,767,273
	Chofer (*)	M-H	1404	2,000	2,808,000	0.909	2,552,727
IV	**SERVICIOS**						
	TRANSABLE						
	NO TRANSABLE						
	GASTOS OPERATIVOS	meses	486	500	243,000	0.84	204,202
	agua	meses	486	50	24,300	0.84	20,420
	luz	meses	486	60	29,160	0.84	24,504
	telefonia fija	meses	486	60	29,160	0.84	24,504
	internet	meses	486	100	48,600	0.84	40,840
	local	meses	486	500	243,000	0.84	204,202
	Afinamiento (*)	Número	1929	40	77,160	0.84	64,840
	Lavado y engrase (*)	Número	2324	45	104,580	0.84	87,882
	SUBTOTAL				**19,695,023**		**16,244,397**
	TOTAL				**26,708,845**		**22,517,206**

(*) SERAN EJECUTADOS EN LAS AGENCIAS ZONALES PORQUE ESTA DESTINADO PARA CADA SUPERVISION

COSTO DE SUPERVISION TECNICA INTERNACIONAL

	DESCRIPCION	UNIDAD	CANT.	COSTO UNIT.	COSTO TOTAL PRECIO PRIV.	F.C	COSTO TOTAL PRECIO SOC.
I	**MAQUINARIA Y/O EQUIPO**						
	TRANSABLE						
	Equipo de cómputo	E.C.		4,500	0	0.84	0
	Camionetas 4x4 doble cabina	Vehículo	0	90,000	0	0.84	0
	Impresora+fotocopiadora	unid		8,000	0	0.84	0
II	**MATERIALES Y/O INSUMOS**						
	NO TRANSABLE						
	Utiles de oficina	Global			0	0.84	0
	Combustible	Galón		12	0	0.66	0
	escritorios	unid		350	0	0.84	0
III	**MANO DE OBRA**						
	CALIFICADA						
	Team Leader	M-H	34	86,218	2,931,410	0.909	2,664,918
	Sr. Project Management Specialist	M-H	13	86,218	1,120,833	0.909	1,018,939
	Sr. Agronomist	M-H	6	86,218	517,308	0.909	470,280
	Construction Supervion(1)	M-H	14	86,218	1,207,051	0.909	1,097,319
IV	**SERVICIOS**						
	NO TRANSABLE						
	Project Management Specialist (Co-T/L)	M-H	45	15,600	702,000	0.909	638,182
	Agronomist	M-H	18	15,600	280,800	0.909	255,273
	Watershed Management Spesialist	M-H	0	15,600	0	0.909	0
	Design Enginner(1) for Supervision of Evaluatic	M-H	5	15,600	78,000	0.909	70,909
	Design Enginner(2) for Evaluation of DD	M-H	27	15,600	421,200	0.909	382,909
	Expert for Comite de Regantes	M-H	5	15,600	78,000	0.909	70,909
	Specialist for Civilwork(1)	M-H	43	15,600	670,800	0.909	609,818
	Specialist for Civilwork(2)	M-H	24	15,600	374,400	0.909	340,364
	Agro—Economist	M-H	4	15,600	62,400	0.909	56,727
	GIS Specialist	M-H	6	15,600	93,600	0.909	85,091
	Environmental Specialsit	M-H	6	15,600	93,600	0.909	85,091
	supervisores de obra	M-H	0	8,000	0	0.909	0
	Office manager	M-H	43	4,000	172,000	0.909	156,364
	Secretary	M-H	43	4,000	172,000	0.909	156,364
	Translator	M-H	0	4,000	0	0.909	0
	Accountant	M-H	43	4,000	172,000	0.909	156,364
	Assistant engineer	M-H	124	4,000	496,000	0.909	450,909
	Computer Operator	M-H	126	4,000	504,000	0.909	458,182
	Office boy	M-H	43	4,000	172,000	0.909	156,364
	CAMIONETA SUP		28	77,490			
	NO TRANSABLE						
	International Airfare		12	22,660	271,923	0.84	228,507
	Domestic Airfare		90	1,200	108,000	0.84	90,756
	Domestic Travel		0	300	0	0.84	0
	Accommodation Allowance	meses	183	4,500	823,500	0.84	692,017
	Vehicle Rental	meses	83.33	8,000	666,640	0.84	560,202
	Office Rental	meses	48	6,500	312,000	0.84	262,185
	International Communications	meses	67	50	3,350	0.84	2,815
	Domestic Communications	meses	48	10	480	0.84	403
	Office Supply	meses	48	300	14,400	0.84	12,101
	Office Furniture and Equipment	meses	48	3,000	144,000	0.84	121,008
	Computer for Supervisor	Número	0	5,000	0	0.84	0
	SUBTOTAL				**12,663,696**		**11,351,269**
	contingencia						
	TOTAL				**12,663,696**		**11,351,269**

Costo de Operación Y mantenimiento con Proyecto Precios Sociales

	AÑOS									
DESCRIPCION	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
TOTAL PROGRAMA (C/P)	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**
Operación	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1
Mantenimiento	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7
DEPARTAMENTOS										
AMAZONAS	94,334.8	94,334.8	94,334.8	94,334.8	94,334.8	94,334.8	94,334.8	94,334.8	94,334.8	94,334.8
ANCASH	137,250.8	137,250.8	137,250.8	137,250.8	137,250.8	137,250.8	137,250.8	137,250.8	137,250.8	137,250.8
AYACUCHO	55,792.5	55,792.5	55,792.5	55,792.5	55,792.5	55,792.5	55,792.5	55,792.5	55,792.5	55,792.5
CAJAMARCA	153,493.5	153,493.5	153,493.5	153,493.5	153,493.5	153,493.5	153,493.5	153,493.5	153,493.5	153,493.5
HUANUCO	16,128.4	16,128.4	16,128.4	16,128.4	16,128.4	16,128.4	16,128.4	16,128.4	16,128.4	16,128.4
HUANCAVELICA	12,213.0	12,213.0	12,213.0	12,213.0	12,213.0	12,213.0	12,213.0	12,213.0	12,213.0	12,213.0
JUNIN	185,653.1	185,653.1	185,653.1	185,653.1	185,653.1	185,653.1	185,653.1	185,653.1	185,653.1	185,653.1
LA LIBERTAD	44,576.6	44,576.6	44,576.6	44,576.6	44,576.6	44,576.6	44,576.6	44,576.6	44,576.6	44,576.6
PIURA	31,778.2	31,778.2	31,778.2	31,778.2	31,778.2	31,778.2	31,778.2	31,778.2	31,778.2	31,778.2
TOTAL PROGRAMA:	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**	**731,220.9**

COSTOS DE OPERACIÓN Y MANTENIMIENTO INCREMENTALES A PRECIOS SOCIALES

Costos de operación Con/Proy	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1	350,619.1
Costos de operación Sin/Proy	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4
Costos de operac. Incremental	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**	**149,506.8**
Costos de mant. Con/Proy.	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7	380,601.7
Costos de mant. Sin/Proy.	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9
Costos de mant. Incremental	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**	**39,264.8**

Costo de Operación Y mantenimiento Sin Proyecto Precios Sociales

	AÑOS									
DESCRIPCION	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
TOTAL PROGRAMA (S/P)	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**
Operación	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4	201,112.4
Mantenimiento	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9	341,336.9
DEPARTAMENTOS										
AMAZONAS	454,744.0	454,744.0	454,744.0	454,744.0	454,744.0	454,744.0	454,744.0	454,744.0	454,744.0	454,744.0
ANCASH	12,796.2	12,796.2	12,796.2	12,796.2	12,796.2	12,796.2	12,796.2	12,796.2	12,796.2	12,796.2
AYACUCHO	3,048.2	3,048.2	3,048.2	3,048.2	3,048.2	3,048.2	3,048.2	3,048.2	3,048.2	3,048.2
CAJAMARCA	57,670.9	57,670.9	57,670.9	57,670.9	57,670.9	57,670.9	57,670.9	57,670.9	57,670.9	57,670.9
HUANUCO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HUANCAVELICA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
JUNIN	4,419.3	4,419.3	4,419.3	4,419.3	4,419.3	4,419.3	4,419.3	4,419.3	4,419.3	4,419.3
LA LIBERTAD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PIURA	9,770.7	9,770.7	9,770.7	9,770.7	9,770.7	9,770.7	9,770.7	9,770.7	9,770.7	9,770.7
TOTAL PROGRAMA:	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**	**542,449.2**

Costo de Operación Y mantenimiento con Proyecto Precios Privados

	AÑOS									
DESCRIPCION/AÑOS	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
TOTAL PROGRAMA (C/P)	**842,103.3**	**842,503.3**	**846,183.3**	**842,503.3**	**842,503.3**	**846,183.3**	**842,503.3**	**842,503.3**	**846,183.3**	**842,503.3**
Operación	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3
Mantenimiento	452,916.1	453,316.1	456,996.1	453,316.1	453,316.1	456,996.1	453,316.1	453,316.1	456,996.1	453,316.1
DEPARTAMENTOS										
AMAZONAS	109,536.6	109,536.6	109,536.6	109,536.6	109,536.6	109,536.6	109,536.6	109,536.6	109,536.6	109,536.6
ANCASH	156,119.0	156,519.0	160,199.0	156,519.0	156,519.0	160,199.0	156,519.0	156,519.0	160,199.0	156,519.0
AYACUCHO	64,076.0	64,076.0	64,076.0	64,076.0	64,076.0	64,076.0	64,076.0	64,076.0	64,076.0	64,076.0
CAJAMARCA	176,250.0	176,250.0	176,250.0	176,250.0	176,250.0	176,250.0	176,250.0	176,250.0	176,250.0	176,250.0
HUANUCO	18,805.0	18,805.0	18,805.0	18,805.0	18,805.0	18,805.0	18,805.0	18,805.0	18,805.0	18,805.0
HUANCAVELICA	13,689.0	13,689.0	13,689.0	13,689.0	13,689.0	13,689.0	13,689.0	13,689.0	13,689.0	13,689.0
JUNIN	215,048.2	215,048.2	215,048.2	215,048.2	215,048.2	215,048.2	215,048.2	215,048.2	215,048.2	215,048.2
LA LIBERTAD	51,580.0	51,580.0	51,580.0	51,580.0	51,580.0	51,580.0	51,580.0	51,580.0	51,580.0	51,580.0
PIURA	36,999.5	36,999.5	36,999.5	36,999.5	36,999.5	36,999.5	36,999.5	36,999.5	36,999.5	36,999.5
TOTAL PROGRAMA:	**842,103.3**	**842,503.3**	**846,183.3**	**842,503.3**	**842,503.3**	**846,183.3**	**842,503.3**	**842,503.3**	**846,183.3**	**842,503.3**

COSTOS DE OPERACIÓN Y MANTENIMIENTO INCREMENTALES A PRECIOS PRIVADOS

Costos de operación Con/Proy	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3	389,187.3
Costos de operación Sin/Proy	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7
Costos de operac. Incremental	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**	**165,952.5**
Costos de mant. Con/Proy.	452,916.1	453,316.1	456,996.1	453,316.1	453,316.1	456,996.1	453,316.1	453,316.1	456,996.1	453,316.1
Costos de mant. Sin/Proy.	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9
Costos de mant. Incremental	**46,725.2**	**47,125.2**	**50,805.2**	**47,125.2**	**47,125.2**	**50,805.2**	**47,125.2**	**47,125.2**	**50,805.2**	**47,125.2**

Costo de Operación Y mantenimiento Sin Proyecto Precios Privados

	AÑOS									
DESCRIPCION/AÑOS	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
TOTAL PROGRAMA (S/P)	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**
Operación	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7	223,234.7
Mantenimiento	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9	406,190.9
DEPARTAMENTOS										
AMAZONAS	527,127.4	527,127.4	527,127.4	527,127.4	527,127.4	527,127.4	527,127.4	527,127.4	527,127.4	527,127.4
ANCASH	14,606.8	14,606.8	14,606.8	14,606.8	14,606.8	14,606.8	14,606.8	14,606.8	14,606.8	14,606.8
AYACUCHO	3,526.4	3,526.4	3,526.4	3,526.4	3,526.4	3,526.4	3,526.4	3,526.4	3,526.4	3,526.4
CAJAMARCA	67,850.0	67,850.0	67,850.0	67,850.0	67,850.0	67,850.0	67,850.0	67,850.0	67,850.0	67,850.0
HUANUCO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HUANCAVELICA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
JUNIN	5,116.3	5,116.3	5,116.3	5,116.3	5,116.3	5,116.3	5,116.3	5,116.3	5,116.3	5,116.3
LA LIBERTAD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PIURA	11,198.7	11,198.7	11,198.7	11,198.7	11,198.7	11,198.7	11,198.7	11,198.7	11,198.7	11,198.7
TOTAL PROGRAMA:	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**	**629,425.6**

4. COSTO DE PRODUCCIÓN, CHACRA, RENDIMIENTO

Los Costos de Produccion, Precio en Chacra, Rendimiento

UBICACION	AREAS DE PRODUCCION INSTALADAS (HAS)		AREAS INSTALADAS POR CAMPAÑA BASE Y ROTACION (HAS)		COSTO DE PRODUCCION POR HA (S/.)		RENDIMIENTO POR HECTAREA (KG/HA)		PRECIO EN CHACRA (S/.)
	CON PROYECTO	SIN PROYECTO	CAMPAÑA BASE	CAMPAÑA DE ROTACION	CON PROYECTO	SIN PROYECTO	CON PROYECTO	SIN PROYECTO	
AMAZONAS									
AMA-1									
ARROZ	500	1,300	650	650	4,396	3,115	8,000	9,000	0.60
FRIJOL	10	109	60	49	2,446	1,569	1,000	1,500	2.50
MAÍZ AMILÁCEO	20	40		40	2,576	1,588	2,000	2,500	1.50
PASTOS	47	0	0		949	0	80,000	0	0.02
SOJA	0	69	69		1,853	1,501	0	2,500	2.00
AMA-10									
LIMON SUTIL	90	150	150		3,715	2,518	22,000	24,560	0.25
MANGO	150	200	200		5,921	4,203	20,000	23,160	0.35
AMA-11									
ARROZ	650	1,300	650	650	4,396	3,115	8,000	9,000	0.55
FRIJOL		203	100	103	2,446	1,569		1,500	1.63
MAÍZ AMILÁCEO		100		100	2,576	1,588		2,500	1.50
PASTOS	176	0			949		80,000		0.01
SOJA		103	103		1,853	1,501		2,500	0.74
AMA-12									
ARROZ	400	1,000	500	500	4,396	3,115	8,000	9,000	0.55
FRIJOL		36		36	2,446	1,569			1.63
PASTOS	103				949		80,000	0	0.01
SOJA		36	36		1,853	1,501		2,500	0.74
AMA-13									
ARROZ	600	1,500	750	750	4,396	3,115	8,000	9,000	0.55
FRIJOL	16	71	40	31	2,446	1,569	1,000	1,500	2.45
MAÍZ AMILÁCEO	15	50	10	40	2,576	1,588	2,000	2,500	1.29
PASTOS	50	0			949		80,000		0.01
SOJA	0	41	31	10	1,853	1,501		2,500	0.74
AMA-14									
ARROZ	200	500	250	250	4,396	3,115	8,000	9,000	0.55
FRIJOL		50	25	25	2,446	1,569		1,500	2.30
PASTOS	69	0			2,576	0	80,000		0.01
SOJA		25	25		1,853	1,501		2,500	0.74
AMA-2									
ARROZ	1,200	2,400	1,200	1,200	4,396	3,115	8,000	9,000	0.60
FRIJOL	22	187	50	137	2,446	1,569	1,000	1,500	2.50
MAÍZ AMILÁCEO	80	100	50	50	2,576	1,588	2,000	2,500	1.50
PASTOS	20	0			949	0	80,000	0	0.02
SOJA	0	187	137	50	1,853	1,501	0	2,500	2.00
AMA-3									
ARROZ	350	800	400	400	4,396	3,115	8,000	9,000	0.60
FRIJOL	0	55	38	18	2,446	1,569	1,000	1,500	2.50
MAÍZ AMILÁCEO	13	58	20	38	2,576	1,588	2,000	2,500	1.50
PASTOS	40	0			949	0	80,000	0	0.02
SOJA	0	38	18	20	1,853	1,501	0	2,500	2.00
AMA-4									
ARROZ	350	840	420	420	4,396	3,115	8,000	9,000	0.60
FRIJOL		80	40	40	2,446	1,569	1,000	1,500	2.50
MAÍZ AMILÁCEO		74	34	40	2,576	1,588	2,000	2,500	1.50
PASTOS	51	0			949	0	80,000	0	0.02
SOJA	0	74	40	34	1,853	1,501	0	2,500	2.00
AMA-5									
ARROZ	350	800	400	400	4,396	3,115	8,000	9,000	0.60
FRIJOL	14	114	50	64	2,446	1,569	1,000	1,500	2.50
MAÍZ AMILÁCEO	50	50		50	2,576	1,588	2,000	2,500	1.50
PASTOS	100	0			949	0	80,000	0	0.02
SOJA	0	0			1,853	1,501	0	2,500	2.00
AMA-6									
ARROZ	900	1,800	900	900	4,396	3,115	8,000	9,000	0.60
FRIJOL		297	100	197	2,446	1,569	1,000	1,500	2.50
MAÍZ AMILÁCEO		100		100	2,576	1,588	2,000	2,500	1.50
PASTOS	152	0			949	0	80,000	0	0.02
SOJA	0	197	197		1,853	1,501	0	2,500	2.00
AMA-8									
ARROZ	200	400	200	200	4,396	3,115	8,000	9,000	0.60
FRIJOL		24	14	10	2,446	1,569	1,000	1,500	2.50
MAÍZ AMILÁCEO		34	20	14	2,576	1,588	2,000	2,500	1.50
PASTOS	41	0			949	0	80,000	0	0.02
SOJA	0	30	10	20	1,853	1,501	0	2,500	2.00
AMA-9									
ARROZ	500	1,240	620	620	4,396	3,115	8,000	10,000	0.60
FRIJOL	20	80	20	60	2,446	1,569	1,000	1,500	2.50
MAÍZ AMILÁCEO	30	50	30	20	2,576	1,588	2,000	2,500	1.50
PASTOS	80	0			949	0	80,000	0	0.02
SOJA	0	90	60	30	1,853	1,501	0	2,500	2.00

Los Costos de Produccion, Precio en Chacra, Rendimiento

UBICACION	VOLUMEN DE PRODUCCION ANUAL (KG)		COSTO DE LA PRODUCCION CON PROYECTO (S/.)		COSTO DE LA PRODUCCION SIN PROYECTO (S/.)		VALOR BRUTO DE LA PRODUCCION (S/.)	
	CON PROYECTO	SIN PROYECTO	PRECIO PRIVADO	PRECIO SOCIAL	PRECIO PRIVADO	PRECIO SOCIAL	CON PROYECTO	SIN PROYECTO
AMAZONAS								
AMA-1								
ARROZ	4,000,000	11,700,000	5,715,255	4,049,977	2,198,175	1,557,683	2,400,000	7,020,000
FRIJOL	10,000	163,050	265,849	170,590	24,457	15,694	25,000	407,625
MAÍZ AMILÁCEO	40,000	100,000	103,034	63,530	51,517	31,765	60,000	150,000
PASTOS	3,760,000	0	0	0	44,622	0	75,200	0
SOJA	0	171,750	127,315	103,125	0	0	0	343,500
AMA-10								
LIMON SUTIL	1,980,000	3,684,000	557,220	377,756	334,332	226,653	495,000	921,000
MANGO	3,000,000	4,632,000	1,184,186	840,614	888,140	630,461	1,050,000	1,621,200
AMA-11								
ARROZ	5,200,000	11,700,000	5,715,255	4,049,977	2,857,628	2,024,988	2,857,628	6,429,662
FRIJOL	0	303,750	495,257	317,796	0	0	0	495,113
MAÍZ AMILÁCEO	14,052,000	0	0	0	452,450	278,974		375,000
PASTOS	0	256,250	97,315	0	0	0	166,764	0
SOJA			185,320	150,109	0	0	0	189,625
AMA-12	3,200,000	9,000,000						
ARROZ	0	54,315	4,396,350	3,115,367	1,758,540	1,246,147	1,758,540	4,945,894
FRIJOL	8,200,000	0	88,559	56,827	0	0	0	88,533
PASTOS	0	90,525	34,378	0	0	0	97,315	0
SOJA			67,104	54,355	0	0	0	66,989
AMA-13	4,800,000	13,500,000						
ARROZ	16,070	106,605	6,594,525	4,673,050	2,637,810	1,869,220	2,637,810	7,418,841
FRIJOL	30,000	125,000	173,817	111,535	39,303	25,220	39,303	260,725
MAÍZ AMILÁCEO	4,000,000	0	128,793	79,412	38,638	23,824	38,638	160,991
PASTOS	0	102,675	0	0	47,471	0	47,471	0
SOJA			76,111	61,650	0	0		75,980
AMA-14	1,600,000	4,500,000						
ARROZ	0	75,210	2,198,175	1,557,683	879,270	623,073	879,270	2,472,947
FRIJOL	5,500,800	0	122,628	78,688	0	0	0	172,983
PASTOS	0	62,500	0	0	177,116	0	65,281	0
SOJA			46,330	37,527	0	0	0	46,330
AMA-2	9,600,000	21,600,000						
ARROZ	21,900	280,215	10,551,240	7,476,880	5,275,620	3,738,440	5,760,000	12,960,000
FRIJOL	160,000	250,000	456,884	293,172	53,561	34,369	54,750	700,538
MAÍZ AMILÁCEO	1,600,000	0	257,586	158,824	206,069	127,059	240,000	375,000
PASTOS	0	467,025	0	0	18,988	0	32,000	0
SOJA			346,159	280,419	0	0	0	934,050
AMA-3	2,800,000	7,200,000						
ARROZ	0	82,500	3,517,080	2,492,293	1,307,914	926,822	1,680,000	4,320,000
FRIJOL	26,000	143,750	134,514	86,315	0	0	0	206,250
MAÍZ AMILÁCEO	3,200,000	0	148,112	91,324	28,463	17,550	39,000	215,625
PASTOS	0	93,750	0	0	32,280	0	64,000	0
SOJA			69,488	56,291	0	0	0	187,500
AMA-4	2,800,000	7,560,000						
ARROZ	0	120,000	3,692,934	2,616,908	1,307,914	926,822	1,680,000	4,536,000
FRIJOL	0	186,125	195,657	125,549	0	0	0	300,000
MAÍZ AMILÁCEO	4,060,000	0	191,773	118,244	0	0	0	279,188
PASTOS	0	186,125	0	0	40,955	0	81,200	0
SOJA			137,956	111,756	0	0	0	372,250
AMA-5	2,800,000	7,200,000						
ARROZ	14,110	171,165	3,517,080	2,492,293	1,307,914	926,822	1,680,000	4,320,000
FRIJOL	100,000	125,000	279,080	179,080	29,333	18,822	35,275	427,913
MAÍZ AMILÁCEO	8,000,000	0	128,793	79,412	109,474	67,500	150,000	187,500
PASTOS	0	0	0	0	80,700	0	160,000	0
SOJA			0	0	0	0	0	0
AMA-6	7,200,000	16,200,000						
ARROZ	0	445,725	7,913,430	5,607,660	3,363,208	2,383,256	4,320,000	9,720,000
FRIJOL	0	250,000	726,743	466,336	0	0	0	1,114,313
MAÍZ AMILÁCEO	12,160,000	0	257,586	158,824	0	0	0	375,000
PASTOS	0	492,875	0	0	122,664	0	243,200	0
SOJA			365,319	295,940	0	0	0	985,750
AMA-8	1,600,000	3,600,000						
ARROZ	0	35,865	1,758,540	1,246,147	747,380	529,612	960,000	2,160,000
FRIJOL	0	84,775	58,477	37,523	0	0	0	89,663
MAÍZ AMILÁCEO	3,258,400	0	87,347	53,857	0	0	0	127,163
PASTOS	0	75,000	0	0	32,869	0	65,168	0
SOJA			55,590	45,033	0	0	0	150,000
AMA-9	4,000,000	12,400,000						
ARROZ	20,000	120,000	5,451,474	3,863,055	1,868,449	1,324,031	2,400,000	7,440,000
FRIJOL	59,900	124,800	195,657	125,549	41,577	26,679	50,000	300,000
MAÍZ AMILÁCEO	6,400,000	0	128,587	79,285	65,575	40,433	89,850	187,200
PASTOS	0	224,875	0	0	64,560	0	128,000	0
SOJA			166,677	135,023	0	0	0	449,750

UBICACION	AREAS DE PRODUCCION INSTALADAS (HAS)		AREAS INSTALADAS POR CAMPAÑA BASE Y ROTACION (HAS)		COSTO DE PRODUCCION POR HA (S/.)		RENDIMIENTO POR HECTAREA (KG/HA)		PRECIO EN CHACRA (S/.)
	CON PROYECTO	SIN PROYECTO	CAMPAÑA BASE	CAMPAÑA DE ROTACION	CON PROYECTO	SIN PROYECTO	CON PROYECTO	SIN PROYECTO	
ANCASH									
ANC-10									
ALFALFA	0	50	50		2,845	1,715	7,200	16,000	0.16
ALFALFA (MANTE	2	365	365		2,077	1,291	9,900	24,000	0.18
CEBADA	7	10	10		720	449	890	1,150	0.80
MAÍZ AMILÁCEO	10	40	40		1,380	829	1,045	1,350	0.85
PAPA	10	40	40	2	3,280	2,383	7,688	9,900	0.40
TRIGO	11	20	20	2	897	588	848	1,140	
ANC-11									0.35
ALFALFA	10	300	300		2,077	1,291	11,550	16,500	2.00
ARVEJA GRANO SECO		200		200	1,120	905	1,540	2,200	1.20
CEBADA	78				720	449	972		2.00
HABA GRANO SE	10	225	225		1,020	800	1,540	2,200	0.90
HORTALIZAS	12	200		200	3,570	2,227	12,600	18,000	2.00
MAÍZ AMILÁCEO	110				1,380	829	5,985	8,550	0.99
OLLUCO	58				2,060	2,120	4,571		1.00
PAPA	120	425	200	225	3,280	2,383	5,985	8,550	0.30
PASTOS		325	325		695	500	10,500	15,000	1.80
TRIGO	214	200	200		897	588	1,120	1,600	
ANC-12									3.20
HABA GRANO SE	3	32	32		1,020	800	1,068	1,306	0.60
PAPA	9	100	60	40	3,280	2,383	9,610	10,250	0.20
PASTOS	8	64	64		695	500	12,000	45,000	3.00
TARWI	4	45	45		1,541	945	683	1,460	1.50
TRIGO	3	43	43		897	588	979	1,116	
ANC-16									0.80
CEBADA	8	10	100		720	449	890	1,158	0.85
MAÍZ AMILÁCEO	8	60	60		1,380	829	1,044	1,357	0.40
PAPA	14	142	60	82	3,280	2,383	7,688	9,994	0.25
PASTOS	10	435	435		695	539	9,900	16,000	0.90
TRIGO	6	60	60		897	588	848	1,102	
ANC-17									0.30
ALFALFA	65	150	150		2,077	1,291	24,619	35,000	1.41
HABA GRANO SE	35	205	90	115	1,020	800	1,117	1,450	0.60
MAÍZ AMILÁCEO	40	385	140	245	1,380	829	4,214	5,000	0.55
PAPA	70	295	155	140	3,280	2,383	9,872	13,500	1.05
TRIGO	30	115	115		897	588	975	1,375	
ANC-18									1.20
ARVEJA GRANO S	85	215	55	160	1,120	905	850	1,050	1.36
CEBADA	25	25	25		792	662	980	1,200	2.50
FRIJOL	10	180		180	1,825	1,670	850	1,150	1.80
FRUTALES	10	10	10		1,790	1,680	6,500	8,400	1.15
HABA GRANO SE	45	45	45		1,020	800	850	1,050	1.30
MAÍZ AMILÁCEO	255	285	255	30	1,530	1,245	850	1,150	0.70
OCA	25	25	25		1,960	1,775	4,300	4,800	1.10
OLLUCO	25	25	25		2,120	2,060	4,600	5,200	0.75
PAPA	50	170	40	130	3,850	3,065	6,000	9,500	0.20
PASTOS	20	20	20		695	500	10,000	1,100	1.56
TRIGO	140	140	140		875	745	950	1,260	
ANC-19									6.05
ALCACHOFA	11	25	25		6,607	4,591	8,500	11,900	0.20
ALFALFA	7	26	26		2,077	1,291	25,000	31,250	1.25
ARVEJA GRANO S	10	20	20		1,245	704	3,500	4,200	0.52
CEBADA	21	45	45		720	373	960	1,150	0.56
MAIZ CHOCLO	30	81	81		1,777	991	8,530	10,240	0.47
OLLUCO	9	17	17		2,357	1,548	4,160	6,240	0.40
PAPA	37	106	83	23	3,924	2,747	8,740	13,110	0.55
TRIGO	25	52	52		777	421	980	1,230	
ANC-2									1.25
ARVEJA GRANO S	20	20	20		1,747	1,294	6,000	9,000	0.52
CEBADA	80	100	60	40	3,239	2,592	4,000	6,000	0.51
HABA GRANO SE	30	30	30		1,854	1,351	6,000	9,000	0.56
MAÍZ AMILÁCEO	80	110	110		1,153	852	4,240	7,250	0.47
OLLUCO	20	20		20	1,312	868	8,500	10,000	0.40
PAPA	75	105	90	15	3,460	2,599	9,000	12,000	0.55
TRIGO	95	125	75	50	632	407	1,700	5,100	
ANC-20									2.00
ARVEJA GRANO S	0	25	15	10	1,245	704		1,000	2.00
HABA GRANO SE	0	40	15	25	1,020	800		1,000	6.00
HIERBAS AROMA	0	45	45		4,294	2,552		5,000	1.00
MAÍZ AMILÁCEO	0	45	25	20	1,777	991		1,600	0.50
PAPA	0	45	25	20	3,460	2,599		6,000	
ANC-3									2.00
ARVEJA GRANO S	0	173	73	100	800	740		1,000	1.00
MAÍZ AMILÁCEO	0	270	150	120	1,200	1,100		1,600	0.90
PALTA	0	120	120		3,580	3,312		8,500	0.75
PAPA	0	193	120	73	1,800	1,665		6,000	0.85
TRIGO	0	200	100	100	897	830		979	
ANC-4									2.50
ARVEJA GRANO S	15	102	30	72	1,036	643	1,000	1,500	1.90
HIERBAS AROMA	0	80	80	0	4,294	2,552	0	5,000	1.50
MAÍZ AMILÁCEO	15	170	100	70	1,380	829	2,000	2,500	0.80
PAPA	20	183	103	80	3,280	2,383	6,000	6,600	

UBICACION	VOLUMEN DE PRODUCCION ANUAL (KG)		COSTO DE LA PRODUCCION CON PROYECTO (S/.)		COSTO DE LA PRODUCCION SIN PROYECTO (S/.)		VALOR BRUTO DE LA PRODUCCION (S/.)	
	CON PROYECTO	SIN PROYECTO	PRECIO PRIVADO	PRECIO SOCIAL	PRECIO PRIVADO	PRECIO SOCIAL	CON PROYECTO	SIN PROYECTO
ANCASH								
ANC-10	0	800,000						
ALFALFA	19,800	8,760,000	142,256	85,750	0	0	0	128,000
ALFALFA (MANTE	6,233	11,500	758,269	471,208	3,532	2,195	3,564	1,576,800
CEBADA	10,448	54,000	7,200	4,494	4,284	2,674	4,986	9,200
MAÍZ AMILÁCEO	76,880	396,000	55,200	33,167	11,730	7,048	8,881	45,900
PAPA	9,328	22,800	131,180	95,335	27,876	20,259	30,752	158,400
TRIGO			17,940	11,757	8,387	5,496		
ANC-11	115,500	4,950,000					40,425	1,732,500
ALFALFA	0	440,000	623,235	387,294	17,658	10,973	0	880,000
ARVEJA GRANO S	75,816	0	224,000	181,000	0	0	90,979	0
CEBADA	15,400	495,000	0	0	47,736	29,797	30,800	990,000
HABA GRANO SEC	151,200	3,600,000	229,500	180,000	8,670	6,800	136,080	3,240,000
HORTALIZAS	658,350	0	714,000	445,400	36,414	22,715	1,316,700	0
MAÍZ AMILÁCEO	265,118	0	0	0	129,030	77,527	262,467	0
OLLUCO	718,200	3,633,750	0	0	101,558	104,516	718,200	3,633,750
PAPA	0	4,875,000	1,393,788	1,012,934	334,509	243,104	0	1,462,500
PASTOS	239,680	320,000	225,875	162,500	0	0	431,424	576,000
TRIGO			179,400	117,567	163,164	106,927		
ANC-12	3,204	41,792					10,253	133,734
HABA GRANO SEC	81,685	1,025,000	32,640	25,600	2,601	2,040	49,011	615,000
PAPA	96,000	2,880,000	327,950	238,337	23,694	17,220	19,200	576,000
PASTOS	2,732	65,700	44,480	32,000	4,726	3,400	8,196	197,100
TARWI	2,937	47,988	69,345	42,525	5,239	3,213	4,406	71,982
TRIGO			38,571	25,277	2,287	1,499		
ANC-16	7,123	11,575					5,699	9,260
CEBADA	8,352	81,432	7,200	4,494	4,896	3,056	7,099	69,217
MAÍZ AMILÁCEO	107,632	1,419,205	82,800	49,750	9,384	5,638	43,053	567,682
PAPA	99,000	6,960,000	465,689	338,439	39,026	28,362	24,750	1,740,000
PASTOS	5,088	66,144	302,325	234,656	5,908	4,585	4,579	59,530
TRIGO			53,820	35,270	4,575	2,998		
ANC-17	1,600,041	5,250,700					480,012	1,575,210
ALFALFA	39,075	297,294	311,659	193,673	114,765	71,318	55,095	419,184
HABA GRANO SEC	168,605	1,925,050	209,131	164,024	30,338	23,795	101,163	1,155,030
MAÍZ AMILÁCEO	691,104	3,986,955	531,314	319,237	46,929	28,197	380,107	2,192,825
PAPA	29,257	158,104	968,535	703,862	195,153	141,827	30,720	166,010
TRIGO			103,142	67,592	22,874	14,990		
ANC-18	72,250	225,750					86,700	270,900
ARVEJA GRANO S	24,500	30,000	240,800	194,575	76,925	44,392	33,320	40,800
CEBADA	8,500	207,000	19,800	16,550	16,550	9,565	21,250	517,500
FRIJOL	65,000	84,000	328,500	300,600	16,700	10,560	117,000	151,200
FRUTALES	38,250	47,250	17,900	16,800	16,800	12,076	43,988	54,338
HABA GRANO SEC	216,750	327,750	45,900	36,000	36,000	18,633	281,775	426,075
MAÍZ AMILÁCEO	107,500	120,000	435,908	354,683	317,348	177,044	75,250	84,000
OCA	115,000	130,000	49,000	44,375	44,375	27,461	126,500	143,000
OLLUCO	300,000	1,615,000	53,000	51,500	51,500	33,947	225,000	1,211,250
PAPA	200,000	22,000	654,500	521,050	153,250	109,153	40,000	4,400
PASTOS	133,000	176,400	13,900	10,000	10,000	7,512	207,480	275,184
TRIGO			122,500	104,300	104,300	61,460		
ANC-19	96,815	296,905					585,731	1,796,275
ALCACHOFA	179,500	803,125	164,837	114,556	63,963	44,452	35,900	160,625
ALFALFA	35,560	85,302	53,390	33,178	12,679	7,879	44,450	106,628
ARVEJA GRANO S	20,486	51,532	25,285	14,295	10,751	6,078	10,653	26,796
CEBADA	255,047	826,573	32,272	16,724	13,064	6,770	142,826	462,881
MAIZ CHOCLO	36,067	108,264	143,401	79,984	45,150	25,183	16,952	50,884
OLLUCO	322,943	1,392,675	40,901	26,856	17,373	11,407	129,177	557,070
PAPA	24,353	64,194	416,873	291,815	123,251	86,277	13,394	35,307
TRIGO			40,540	21,966	16,408	8,890		
ANC-2	120,000	180,000					150,000	225,000
ARVEJA GRANO S	320,000	600,000	34,938	25,879	29,697	21,997	166,400	312,000
CEBADA	180,000	270,000	323,892	259,170	142,512	114,035	91,800	137,700
HABA GRANO SEC	339,200	797,500	55,620	40,525	47,277	34,446	189,952	446,600
MAÍZ AMILÁCEO	170,000	200,000	126,808	93,687	78,390	57,916	79,900	94,000
OLLUCO	675,000	1,260,000	26,243	17,352	22,307	14,749	270,000	504,000
PAPA	161,500	637,500	363,334	272,875	220,595	165,674	88,825	350,625
TRIGO			78,975	50,866	51,018	32,860		
ANC-20	0	25,000						
ARVEJA GRANO S	0	40,000	31,124	17,596	0	0		80,000
HABA GRANO SEC	0	225,000	40,800	32,000	0	0		1,350,000
HIERBAS AROMA	0	72,000	193,234	114,845	0	0		72,000
MAÍZ AMILÁCEO	0	270,000	79,943	44,590	0	0		135,000
PAPA			155,714	116,946	0	0		
ANC-3	0	172,500					0	345,000
ARVEJA GRANO S	0	432,000	138,000	127,650	0	0	0	432,000
MAÍZ AMILÁCEO	0	1,020,000	324,000	297,000	0	0	0	918,000
PALTA	0	1,155,000	429,600	397,380	0	0	0	866,250
PAPA	0	195,800	346,500	320,513	0	0	0	166,430
TRIGO			179,400	165,946	0	0		
ANC-4	15,000	153,000					37,500	382,500
ARVEJA GRANO S	0	400,000	105,672	65,552	13,209	8,194	0	760,000
HIERBAS AROMA	30,000	425,000	343,526	204,168	0	0	45,000	637,500
MAÍZ AMILÁCEO	120,000	1,207,800	234,600	140,959	17,595	10,572	96,000	966,240
PAPA			600,149	436,157	55,752	40,517		

UBICACION	AREAS DE PRODUCCION INSTALADAS (HAS)		AREAS INSTALADAS POR CAMPAÑA BASE Y ROTACION (HAS)		COSTO DE PRODUCCION POR HA (S/.)		RENDIMIENTO POR HECTAREA (KG/HA)		PRECIO EN CHACRA (S/.)
	CON PROYECTO	SIN PROYECTO	CAMPAÑA BASE	CAMPAÑA DE ROTACION	CON PROYECTO	SIN PROYECTO	CON PROYECTO	SIN PROYECTO	
ANC-5									2.20
HORTALIZAS	176	352	176	176	3,570	2,227	12,000	14,000	2.20
MAÍZ AMILÁCEO		176		176	3,287	1,791	1,269	2,000	1.50
MANZANA	150	300	150	150	7,500	6,930	5,000	8,000	3.00
PALTA	240	480	240	240	7,670	7,220	8,000	10,000	0.30
PASTOS	300	600	300	300	5,000	4,120	18,000	25,000	3.50
TARA	200	400	200	200	5,995	5,830	5,000	7,000	
ANC-6									0.30
ALFALFA	35	35		35	2,077	1,291	22,000	24,200	1.50
KIWICHA	15	15	15		2,458	1,745	3,800	4,180	1.50
MAÍZ AMILÁCEO	80	80	60	20	1,380	829	9,000	9,900	0.01
MELOCOTONERO	10	10	10		1,680	1,790	1,500,000	1,650,000	1.00
PAPA	35	35	35		3,280	2,383	4,180	4,600	0.90
REPOLLO	30	30	30		3,570	2,505	12,000	13,200	2.20
TRIGO	45	45	45		897	830	1,400	1,540	
ANC-9									1.50
ARVEJA GRANO S	45	45	45		2,077	1,291	2,790	3,100	3.00
FRIJOL	15	15	15		3,570	2,505	3,110	3,450	1.50
MAIZ CHOCLO	80	80	80		1,380	829	9,000	10,000	1.00
PAPA	50	50	50		3,280	2,383	9,000	10,000	2.20
TRIGO	60	60	20	40	632	407	1,260	1,400	
AYACUCHO									
AYA-1									0.90
ARVEJA GRANO S	7	59	37	22	1,223	856	1,810	2,172	0.60
CEBADA	24	94	94		791	553	1,500	1,800	0.80
HABA GRANO SEC	12	64	42	22	1,331	932	2,270	2,724	0.84
HORTALIZAS	7	97	61	36	3,886	2,720	7,020	8,424	1.25
MAÍZ AMILÁCEO	53	211	154	57	1,174	822	1,200	1,440	0.51
MASHUA	4	28	28		1,750	1,225	9,750	11,700	0.82
OCA	6	24	24		1,950	1,365	6,400	7,680	0.95
OLLUCO	9	30	30		3,750	2,625	8,640	10,368	0.42
PAPA	56	255	188	67	3,699	2,589	12,730	15,276	0.05
PASTOS	42	84	84		1,822	1,275	18,000	21,600	0.90
QUINUA	6	22	22		966	676	1,200	1,440	0.75
TRIGO	18	88	88		914	640	1,410	1,692	
AYA-12									0.92
ARVEJA GRANO S	120	120	120		1,223	856	910	2,000	0.20
AVENA FORRAJEI	100	100	100		850	595	12,710	15,000	1.09
AVENA GRANO	150	150	150		830	581	1,790	2,000	0.73
CEBADA	150	150	150		791	553	930	1,800	1.03
HABA GRANO SEC	160	195	150	45	1,331	932	930	1,800	1.03
HORTALIZAS	10	45		45	3,886	2,720	9,700	10,500	0.61
OLLUCO	55	80	50	30	3,750	2,625	5,280	6,000	0.42
PAPA	920	1,110	850	260	3,699	2,589	22,320	25,000	0.21
PASTOS	200	280	140	140	1,822	1,275	19,290	25,000	1.59
QUINUA	200	200	200		966	676	1,000	1,800	0.88
TRIGO	110	110	110		914	640	940	1,800	
AYA-13									0.43
ARVEJA GRANO S	12	380	30	350	1,223	856	830	1,660	0.21
CEBADA	24	100	50	50	791	553	1,440	2,880	1.28
HABA GRANO SEC	12	100	50	50	1,331	932	3,260	6,520	0.67
MAÍZ AMILÁCEO	24	130	100	30	1,174	822	910	1,820	0.70
PAPA	156	450	350	100	3,699	2,589	21,790	40,000	1.15
PASTOS	12	20	20		1,822	1,275	24,800	24,800	
AYA-2									
ARVEJA GRANO S	6	55	35	20	1,223	856	1,350	1,800	0.83
ARVEJA GRANO V	6	50	25	25	980	686	1,875	2,500	0.83
CEBADA	14	178	98	80	791	553	1,350	1,800	0.50
HABA GRANO SEC	5	48	28	20	1,331	932	1,200	1,600	0.90
HABA GRANO VEI	3	20	20	0	1,250	875	2,475	3,300	0.57
MAÍZ AMILÁCEO	6	10	10	0	1,174	822	1,275	1,700	0.99
MAIZ CHOCLO	3	5	5	0	1,050	735	4,575	6,100	0.44
OLLUCO	5	37	37	0	3,750	2,625	3,675	4,900	0.51
PAPA	13	140	100	40	3,699	2,589	11,250	15,000	0.35
QUINUA	0	20	20	0	966	676		1,200	1.57
TRIGO	5	35	25	10	914	640	2,025	2,700	0.63
ZANAHORIA	2	72	36	36	1,860	1,302	6,375	8,500	0.37
AYA-5									
AJO	5				3,300	2,310	4,000		1.91
ALCACHOFA		10	10		7,633	5,343		8,000	2.00
ALFALFA	4	14	14		3,072	2,150	136,980	150,000	0.30
ARVEJA GRANO S	7	22	22		2,221	1,555	1,000	2,500	1.23
ARVEJA GRANO V	2	54	22	32	2,252	1,576	2,670	4,500	1.12
AVENA FORRAJERA		15		15	1,712	1,198		15,000	0.25
CEBADA	15	35	35		1,725	1,208	960	4,000	0.62
FRIJOL	2	12	12		2,176	1,523	1,000	2,000	1.82
HABA GRANO SEC	14	29	29		2,352	1,646	910	2,000	1.32
HABA GRANO VEI	5	55	23	32	2,147	1,503	2,890	3,500	0.93
MAÍZ AMILÁCEO	125	205	205		3,001	2,101	950	3,000	1.23
MAIZ CHOCLO	8	106	48	58	2,816	1,971	4,850	4,200	0.91
MASHUA	2	0			2,800	1,960	3,750		0.39
MELOCOTONERO	7	23	23		10,054	7,038	5,090	16,000	0.92
OCA	2	0			2,598	1,819	4,000		0.52
OLLUCO	2	0			2,598	1,819	4,000		0.59
PAPA	22	138	72	66	7,961	5,573	12,890	20,000	0.51
QUINUA	2	67	67		2,557	1,790	1,000	2,000	1.80
TRIGO	10	36	36		2,252	1,576	1,000	3,000	1.00

UBICACION	VOLUMEN DE PRODUCCION ANUAL (KG)		COSTO DE LA PRODUCCION CON PROYECTO (S/.)		COSTO DE LA PRODUCCION SIN PROYECTO (S/.)		VALOR BRUTO DE LA PRODUCCION (S/.)	
	CON PROYECTO	SIN PROYECTO	PRECIO PRIVADO	PRECIO SOCIAL	PRECIO PRIVADO	PRECIO SOCIAL	CON PROYECTO	SIN PROYECTO
ANC-5	2,112,000	4,928,000					4,646,400	10,841,600
HORTALIZAS	0	352,000	1,256,640	783,904	440,880	173,156	0	774,400
MAÍZ AMILÁCEO	750,000	2,400,000	578,512	315,264	0	0	1,125,000	3,600,000
MANZANA	1,920,000	4,800,000	2,250,000	2,079,000	1,039,500	557,529	5,760,000	14,400,000
PALTA	5,400,000	15,000,000	3,681,600	3,465,600	1,732,800	875,290	1,620,000	4,500,000
PASTOS	1,000,000	2,800,000	3,000,000	2,472,000	1,236,000	772,545	3,500,000	9,800,000
TARA			2,398,000	2,332,000	1,166,000	138,932		
ANC-6	770,000	847,000					231,000	254,100
ALFALFA	57,000	62,700	72,711	45,184	61,804	38,407	85,500	94,050
KIWICHA	720,000	792,000	36,870	26,175	31,340	22,249	1,080,000	1,188,000
MAÍZ AMILÁCEO	15,000,000	16,500,000	110,400	66,334	93,840	56,384	195,000	214,500
MELOCOTONERO	146,300	161,000	16,800	17,900	14,280	15,215	146,300	161,000
PAPA	360,000	396,000	114,783	83,418	97,565	70,905	324,000	356,400
REPOLLO	63,000	69,300	107,100	75,150	91,035	63,878	138,600	152,460
TRIGO			40,365	37,338	34,310	31,737		
ANC-9	125,550	139,500					188,325	209,250
ARVEJA GRANO S	46,650	51,750	93,485	58,094	79,462	49,380	139,950	155,250
FRIJOL	720,000	800,000	53,550	37,575	45,518	31,939	1,080,000	1,200,000
MAIZ CHOCLO	450,000	500,000	110,400	66,334	93,840	56,384	450,000	500,000
PAPA	75,600	84,000	163,975	119,169	139,379	101,293	166,320	184,800
TRIGO			37,908	24,416	32,222	20,753		
AYACUCHO								
AYA-1	12,670	128,148					11,352	114,821
ARVEJA GRANO S	36,000	169,200	72,134	50,494	7,275	5,092	21,672	101,858
CEBADA	27,240	174,336	74,310	52,017	16,127	11,289	21,846	139,817
HABA GRANO SEC	49,140	817,128	85,202	59,641	13,579	9,505	41,081	683,119
HORTALIZAS	63,600	303,840	376,960	263,872	23,123	16,186	79,373	379,192
MAÍZ AMILÁCEO	39,000	327,600	247,756	173,429	52,898	37,028	19,734	165,766
MASHUA	38,400	184,320	49,000	34,300	5,950	4,165	31,642	151,880
OCA	77,760	311,040	46,800	32,760	9,945	6,962	73,716	294,866
OLLUCO	712,880	3,895,380	112,500	78,750	28,688	20,081	300,835	1,643,850
PAPA	756,000	1,814,400	943,176	660,223	176,060	123,242	37,800	90,720
PASTOS	7,200	31,680	153,054	107,138	65,048	45,534	6,494	28,575
QUINUA	25,380	148,896	21,255	14,879	4,927	3,449	18,933	111,076
TRIGO			80,443	56,310	13,986	9,790		
AYA-12	109,200	240,000					100,464	220,800
ARVEJA GRANO S	1,271,000	1,500,000	146,713	102,699	124,706	87,294	254,200	300,000
AVENA FORRAJER	268,500	300,000	85,000	59,500	72,250	50,575	292,665	327,000
AVENA GRANO	139,500	270,000	124,500	87,150	105,825	74,078	101,835	197,100
CEBADA	148,800	351,000	118,580	83,006	100,793	70,555	153,264	361,530
HABA GRANO SEC	97,000	472,500	259,600	181,720	181,054	126,738	99,910	486,675
HORTALIZAS	290,400	480,000	174,879	122,415	33,033	23,123	177,144	292,800
OLLUCO	20,534,400	27,750,000	300,000	210,000	175,313	122,719	8,624,448	11,655,000
PAPA	3,858,000	7,000,000	4,105,590	2,873,913	2,892,407	2,024,685	810,180	1,470,000
PASTOS	200,000	360,000	510,180	357,126	309,752	216,826	318,000	572,400
QUINUA	103,400	198,000	193,228	135,260	164,244	114,971	90,992	174,240
TRIGO			100,554	70,388	85,471	59,830		
AYA-13	9,960	630,800					1,461,673	7,740,000
ARVEJA GRANO S	34,560	288,000	464,592	325,214	12,471	8,729	62,496	104,160
CEBADA	39,120	652,000	79,053	55,337	16,127	11,289	12,749	807,424
HABA GRANO SEC	21,840	236,600	133,128	93,190	13,579	9,505	26,210	436,840
MAÍZ AMILÁCEO	3,399,240	18,000,000	152,646	106,852	23,954	16,768	24,192	201,600
PAPA	297,600	496,000	1,664,429	1,165,100	490,452	343,316	25,116	272,090
PASTOS			36,441	25,509	18,585	13,010		
AYA-2	8,100	99,000						
ARVEJA GRANO S	11,250	125,000	67,244	47,070	6,235	4,365	6,723	82,170
ARVEJA GRANO V	18,900	320,400	49,000	34,300	4,998	3,499	9,338	103,750
CEBADA	6,000	76,800	140,714	98,500	9,407	6,585	9,450	160,200
HABA GRANO SEC	7,425	66,000	63,901	44,731	5,658	3,961	5,400	69,120
HABA GRANO VER	7,650	17,000	25,000	17,500	3,188	2,231	4,232	37,620
MAÍZ AMILÁCEO	13,725	30,500	11,742	8,219	5,988	4,192	7,574	16,830
MAIZ CHOCLO	18,375	181,300	5,250	3,675	2,678	1,874	6,039	13,420
OLLUCO	146,250	2,100,000	138,750	97,125	15,938	11,156	9,371	92,463
PAPA	0	24,000	517,822	362,476	40,871	28,610	51,188	735,000
QUINUA	10,125	94,500	19,323	13,526	0	0	0	37,680
TRIGO	12,750	612,000	31,995	22,396	3,885	2,720	6,379	59,535
ZANAHORIA			133,920	93,744	3,162	2,213	4,718	226,440
AYA-5	19,200	0						
AJO	0	80,000	0	0	13,464	9,425	36,672	0
ALCACHOFA	493,128	2,040,000	76,330	53,431	0	0	0	160,000
ALFALFA	7,200	55,500	41,779	29,245	9,400	6,580	147,938	612,000
ARVEJA GRANO S	4,806	242,100	49,306	34,514	13,593	9,515	8,856	68,265
ARVEJA GRANO V	0	225,000	121,158	84,810	3,446	2,412	5,383	271,152
AVENA FORRAJER	14,400	140,000	25,680	17,976	0	0	0	56,250
CEBADA	2,400	24,800	60,375	42,263	21,994	15,396	8,928	86,800
FRIJOL	12,558	57,600	26,982	18,888	4,439	3,107	4,368	45,136
HABA GRANO SEC	15,606	193,200	67,738	47,416	27,589	19,312	16,577	76,032
HABA GRANO VER	118,560	614,400	118,514	82,960	9,855	6,898	14,514	179,676
MAÍZ AMILÁCEO	37,830	444,360	614,605	430,223	318,346	222,842	145,829	755,712
MAIZ CHOCLO	9,000	0	297,933	208,553	18,670	13,069	34,425	404,368
MASHUA	33,594	361,600	0	0	5,712	3,998	3,510	0
MELOCOTONERO	9,600	0	227,220	159,054	56,403	39,482	30,906	332,672
OCA	7,200	0	0	0	5,300	3,710	4,992	0
OLLUCO	286,158	2,764,000	0	0	3,975	2,782	4,248	0
PAPA	1,800	133,600	1,100,210	770,147	150,224	105,157	145,941	1,409,640
QUINUA	10,200	107,400	170,808	119,565	3,912	2,739	3,240	240,480
TRIGO			80,622	56,435	19,525	13,667	10,200	107,400

UBICACION	AREAS DE PRODUCCION INSTALADAS (HAS)		AREAS INSTALADAS POR CAMPAÑA BASE Y ROTACION (HAS)		COSTO DE PRODUCCION POR HA (S/.)		RENDIMIENTO POR HECTAREA (KG/HA)		PRECIO EN CHACRA (S/.)
	CON PROYECTO	SIN PROYECTO	CAMPAÑA BASE	CAMPAÑA DE ROTACION	CON PROYECTO	SIN PROYECTO	CON PROYECTO	SIN PROYECTO	
AYA-6									
ALFALFA	0	51	51		2,251	1,576	12,600	18,000	0.30
CEBADA	0	32	32		526	368	1,120	1,600	0.68
HABA GRANO VEI	9	69	69		460	322	700	1,000	0.90
MAÍZ AMILÁCEO	11	84	84		672	470	1,050	1,500	1.10
OLLUCO	0	24	24		1,025	718	2,450	3,500	0.81
PAPA	19	140	140		2,827	1,979	7,350	10,500	0.75
TRIGO	12	95	95		408	286	771	1,101	0.78
AYA-9									
ALFALFA	2	30	30		3,072	2,150	1,010	1,250	0.70
HORTALIZAS	2	4	4		3,886	2,720	1,000	1,200	0.80
MAÍZ AMILÁCEO	10	116	29	87	1,174	822	860	1,300	1.00
PAPA	10	116	87	29	3,699	2,589	8,600	10,500	0.50
CAJAMARCA									
CAJ-1									
ALFALFA		300	300		3,072	2,150		30,000	0.02
ARVEJA GRANO S	250	1,280	640	640	1,097	567	2,369	2,369	1.60
CAÑA DE AZUCAR	130				2,990	2,054	10,500	10,500	0.80
CEBADA		100	100		1,725	1,208		2,500	1.07
MAÍZ AMILÁCEO	430	920	460	460	1,582	905	723	723	1.50
PAPA	200	285	255	30	4,049	2,527	7,200	7,200	0.70
PASTOS	630	1,220	610	610	1,325	717	26,780	26,780	0.02
TRIGO		250	250		914	640		3,200	1.07
CAJ-2									
ALFALFA	100	170	170		2,508	2,124	25,000	25,000	0.05
CAMOTE	130	170	100	70	1,308	945	11,750	11,750	0.42
CAÑA DE AZUCAR	400	800	800		2,908	2,272	60,000	60,000	0.45
FRIJOL	100	250	150	100	992	682	1,200	1,200	1.70
MAÍZ AMILÁCEO	140	320	100	220	1,489	1,104	4,350	4,350	0.68
PALTA	100	150	150		4,033	2,740	10,600	10,600	1.20
PAPA	160	210	110	100	3,580	2,923	9,600	9,600	0.60
PASTOS	100	100	100		1,478	959	30,000	30,000	0.05
YUCA	120	120	100	20	1,796	1,303	15,000	15,000	0.48
CAJ-6									
FRIJOL		100	40	60	992	682		1,200	1.70
MAÍZ AMILÁCEO		220	120	100	1,796	1,303		5,000	0.80
PAPA		160	80	80	3,580	2,923		9,600	0.60
PASTOS		160	160		1,478	959		30,000	0.05
CAJ-7									
ARVEJA GRANO S	0	20	20		1,098	567	0	820	1.60
MAÍZ AMILÁCEO	0	50	50		1,796	1,303	0	700	1.50
PAPA	0	90	90		3,580	2,923	0	7,200	0.70
PASTOS	0	440	440		1,478	959	0	4,000	0.02
HUANCAVELICA									
HUANCA-3									
ALFALFA	6	56	56		3,072	2,150	14,245	24,928	0.16
CEBADA	20	35	35		1,725	1,208	1,200	1,500	1.20
HABA GRANO SE(	6	12	12		1,854	1,351	3,500	4,200	1.06
HABA GRANO VEI	3	6	6		2,352	1,646	2,846	3,558	0.46
MAÍZ AMILÁCEO	8	16	16		3,001	2,101	1,200	1,500	1.02
MAIZ CHOCLO	1	21	21		2,816	1,971	7,000	8,750	0.82
MASHUA	1	3	3		2,800	1,960	4,000	5,000	0.39
OCA	1	3	3		2,598	1,819	4,000	5,000	0.39
OLLUCO	2	4	4		2,598	1,819	4,000	5,000	0.41
PAPA	18	48	48		7,961	5,573	7,940	9,925	0.31
TRIGO	16	36	36		2,252	1,576	1,000	1,250	0.73
HUANUCO									
HUA-1									
CEBADA	45	62	45	17	970	679	800	1,300	0.90
HABA GRANO SE(	35	47	35	12	1,854	1,351	4,600	5,000	0.55
MAIZ CHOCLO	35	57	35	22	1,777	991	15,000	17,000	0.18
PAPA	124	204	124	80	4,208	2,946	8,000	12,000	0.52
PASTOS	10	20	10	10	1,320	990	28,000	32,500	0.10
TRIGO		15		15	1,719	1,203	800	1,300	0.90
HUA-2									
CEBADA	86	120	86	34	970	679	850	1,300	0.95
HABA GRANO SE(	32	54	32	22	1,854	1,351	4,600	5,000	0.42
MAIZ CHOCLO	55	140	55	85	1,777	991	15,000	17,000	0.09
PAPA	150	280	150	130	4,208	2,946	8,000	10,000	0.34
PASTOS	77	77	77		1,320	990	28,000	32,500	0.09
TRIGO	2	45		45	1,719	1,203	850	1,300	0.70
JUNIN									
JUNIN-1									
ALCACHOFA	97	178	108	70	6,000	4,800	13,200	15,122	1.52
ALFALFA	66	261	261		707	566	21,850	24,487	0.15
ARVEJA GRANO V	65	146	85	61	912	730	5,200	5,944	1.09
CEBADA	60	144	75	69	1,367	1,280	1,650	1,840	0.91
CEBADA FORRAJI	185	275	70	205	850	680	10,000	12,460	0.13
HABA GRANO VEI	123	225	118	107	1,242	994	5,800	6,725	0.57
MAIZ CHOCLO	173	313	195	118	1,105	884	8,500	10,000	0.44
PAPA	141	216	160	56	6,638	5,311	10,800	11,614	0.47
JUNIN-10									
ALFALFA	5	30	30		707	566	7,210	9,730	0.10
ARVEJA GRANO V	10	65	35	30	912	730	910	1,230	1.05
HORTALIZAS		40		40	660	528	0	1,000	0.30
MAÍZ AMILÁCEO	25	50	50		850	680	1,170	1,570	1.10
JUNIN-2									
PASTOS	60	400	400		707	566	20,000	58,000	0.15

UBICACION	VOLUMEN DE PRODUCCION ANUAL (KG)		COSTO DE LA PRODUCCION CON PROYECTO (S/.)		COSTO DE LA PRODUCCION SIN PROYECTO (S/.)		VALOR BRUTO DE LA PRODUCCION (S/.)	
	CON PROYECTO	SIN PROYECTO	PRECIO PRIVADO	PRECIO SOCIAL	PRECIO PRIVADO	PRECIO SOCIAL	CON PROYECTO	SIN PROYECTO
AYA-6	0	926,640						
ALFALFA	0	51,490	115,875	81,113	0	0	0	277,992
CEBADA	5,950	68,810	16,912	11,838	0	0	0	35,013
HABA GRANO VEF	11,550	126,230	31,677	22,174	3,326	2,328	5,355	61,929
MAÍZ AMILÁCEO	0	83,160	56,557	39,590	6,284	4,399	12,706	138,853
OLLUCO	135,975	1,470,950	24,359	17,051	0	0	0	67,360
PAPA	9,248	104,100	396,058	277,241	44,457	31,120	101,982	1,103,213
TRIGO			38,586	27,010	4,163	2,914	7,214	81,198
AYA-9	2,020	37,500						
ALFALFA	2,000	4,800	92,160	64,512	5,222	3,656	1,414	26,250
HORTALIZAS	8,600	150,800	15,545	10,881	6,607	4,625	1,600	3,840
MAÍZ AMILÁCEO	86,000	1,218,000	136,207	95,345	9,981	6,986	8,600	150,800
PAPA			429,053	300,337	31,439	22,007	43,000	609,000
CAJAMARCA								
CAJ-1	0	9,000,000						
ALFALFA	592,250	3,032,320	921,600	645,120	0	0	0	180,000
ARVEJA GRANO S	1,365,000	0	1,404,160	725,760	274,250	141,750	947,600	4,851,712
CAÑA DE AZUCAR	0	250,000	0	0	388,700	267,020	840,000	0
CEBADA	310,890	665,160	172,500	120,750	0	0	0	267,500
MAÍZ AMILÁCEO	1,440,000	2,052,000	1,455,256	832,600	680,174	389,150	173,520	997,740
PAPA	16,871,400	32,671,600	1,153,965	720,195	809,800	505,400	1,008,000	1,436,400
PASTOS	0	800,000	1,616,500	874,740	834,750	451,710	283,868	326,716
TRIGO			228,533	159,973	0	0		856,000
CAJ-2	2,500,000	4,250,000						
ALFALFA	1,527,500	1,997,500	426,360	361,053	213,180	180,527	125,000	212,500
CAMOTE	24,000,000	48,000,000	222,360	160,708	144,534	104,460	641,550	838,950
CAÑA DE AZUCAR	120,000	300,000	2,326,080	1,817,328	988,584	772,364	10,800,000	21,600,000
FRIJOL	609,000	1,392,000	247,950	170,481	84,303	57,964	204,000	510,000
MAÍZ AMILÁCEO	1,060,000	1,590,000	476,544	353,367	177,215	131,408	414,120	946,560
PALTA	1,536,000	2,016,000	604,950	411,006	342,805	232,903	1,272,000	1,908,000
PAPA	3,000,000	3,000,000	751,716	613,821	486,826	397,522	921,600	1,209,600
PASTOS	1,800,000	1,800,000	147,840	95,910	125,664	81,524	150,000	150,000
YUCA			215,568	156,301	183,233	132,856	864,000	864,000
CAJ-6	0	120,000						
FRIJOL	0	1,100,000	99,180	68,193	0	0	0	204,000
MAÍZ AMILÁCEO	0	1,536,000	395,208	286,552	0	0	0	880,000
PAPA	0	4,800,000	572,736	467,673	0	0	0	921,600
PASTOS			236,544	153,456	0	0	0	240,000
CAJ-7	0	16,400						
ARVEJA GRANO S	0	35,000	21,956	11,350	0	0	0	26,240
MAÍZ AMILÁCEO	0	648,000	89,820	65,125	0	0	0	52,500
PAPA	0	1,760,000	322,164	263,066	0	0	0	453,600
PASTOS			650,496	422,005	0	0	0	35,200
HUANCAVELICA								
HUANCA-3	85,469	1,395,993						
ALFALFA	24,000	52,500	172,032	120,422	15,667	10,967	13,675	223,359
CEBADA	21,000	50,400	60,375	42,263	29,325	20,528	28,800	63,000
HABA GRANO SEC	8,538	21,346	22,248	16,210	9,455	6,889	22,260	53,424
HABA GRANO VEF	9,600	24,000	14,112	9,878	5,998	4,198	3,928	9,819
MAÍZ AMILÁCEO	7,000	183,750	48,016	33,611	20,407	14,285	9,792	24,480
MAIZ CHOCLO	4,000	15,000	59,136	41,395	2,394	1,676	5,740	150,675
MASHUA	4,000	15,000	8,400	5,880	2,380	1,666	1,560	5,850
OCA	8,000	20,000	7,794	5,456	2,208	1,546	1,560	5,850
OLLUCO	142,920	476,400	10,392	7,274	4,417	3,092	3,280	8,200
PAPA	16,000	45,000	382,128	267,490	121,803	85,262	44,305	147,684
TRIGO			81,072	56,750	30,627	21,439	11,680	32,850
HUANUCO								
HUA-1	36,000	80,600						
CEBADA	161,000	235,000	60,140	42,098	37,103	25,972	32,400	72,540
HABA GRANO SEC	525,000	969,000	87,138	63,489	55,157	40,187	88,550	129,250
MAIZ CHOCLO	992,000	2,448,000	101,262	56,480	52,851	29,479	94,500	174,420
PAPA	280,000	650,000	858,432	600,902	443,523	310,466	515,840	1,272,960
PASTOS	0	19,500	26,400	19,800	11,220	8,415	28,000	65,000
TRIGO			25,785	18,050	0	0	0	17,550
HUA-2	73,100	156,000						
CEBADA	147,200	270,000	116,400	81,480	70,907	49,635	1,615	148,200
HABA GRANO SEC	825,000	2,380,000	100,116	72,945	50,429	36,743	61,824	113,400
MAIZ CHOCLO	1,200,000	2,800,000	248,713	138,723	83,052	46,324	74,250	214,200
PAPA	2,156,000	2,502,500	1,178,240	824,768	536,520	375,564	408,000	952,000
PASTOS	1,700	58,500	101,640	76,230	86,394	64,796	194,040	225,225
TRIGO			77,355	54,149	2,922	2,046	1,190	40,950
JUNIN								
JUNIN-1	1,280,400	2,691,716						
ALCACHOFA	1,442,100	6,391,107	1,068,000	854,400	494,700	395,760	1,946,208	4,091,408
ALFALFA	338,000	867,824	184,527	147,622	39,663	31,730	216,315	958,666
ARVEJA GRANO V	99,000	264,960	133,152	106,522	50,388	40,310	368,420	945,928
CEBADA	1,850,000	3,426,500	196,848	184,320	69,717	65,280	90,090	241,114
CEBADA FORRAJI	713,400	1,513,125	233,750	187,000	133,663	106,930	240,500	445,445
HABA GRANO VEF	1,470,500	3,130,000	279,450	223,560	129,851	103,881	406,638	862,481
MAIZ CHOCLO	1,522,800	2,508,624	345,865	276,692	162,490	129,992	647,020	1,377,200
PAPA			1,433,875	1,147,100	795,601	636,481	715,716	1,179,053
JUNIN-10	36,050	291,900						
ALFALFA	9,100	79,950	21,210	16,968	3,005	2,404	3,605	29,190
ARVEJA GRANO V	0	40,000	45,600	36,480	19,380	15,504	9,555	83,948
HORTALIZAS	0	0	42,900	34,320	5,610	4,488	0	12,000
MAÍZ AMILÁCEO	29,250	78,500	34,000	27,200	0	0	32,175	86,350
JUNIN-2								
PASTOS	1,200,000	23,200,000	282,800	226,240	36,057	28,846	180,000	3,480,000

UBICACION	AREAS DE PRODUCCION INSTALADAS (HAS)		AREAS INSTALADAS POR CAMPAÑA BASE Y ROTACION (HAS)		COSTO DE PRODUCCION POR HA (S/.)		RENDIMIENTO POR HECTAREA (KG/HA)		PRECIO EN CHACRA (S/.)
	CON PROYECTO	SIN PROYECTO	CAMPAÑA BASE	CAMPAÑA DE ROTACION	CON PROYECTO	SIN PROYECTO	CON PROYECTO	SIN PROYECTO	
JUNIN-3									
ALCACHOFA	10	40	30	10	6,000	4,800	13,000	16,000	0.99
ARVEJA GRANO V	98	435	200	235	1,507	1,205	3,800	3,800	0.60
AVENA FORRAJERA		42		42	3,131	2,505		30,000	
HABA GRANO VEI	100	271	51	220	1,242	994	4,500	4,500	0.35
HORTALIZAS	160	310	160	150	1,500	1,200	18,000	22,400	0.34
MAIZ CHOCLO	368	623	303	320	1,061	849	9,000	9,000	0.30
PAPA		257	257		6,638	5,311		12,000	0.75
PASTOS	42	100	100		850	680	12,000	30,000	0.11
JUNIN-4									
ALCACHOFA	3,210	3,210	3,210		6,000	4,800	11,900	17,000	2.03
ARVEJA GRANO S	940	940	940		3,929	3,143	1,050	1,500	2.00
AVENA FORRAJEI	70	70		70	3,131	2,505	9,100	13,000	0.22
FLORES	43	43	43		2,500	2,000	1,500	2,000	1.50
HABA GRANO SEC	440	440	440		1,854	1,351	1,260	1,800	1.60
HABA GRANO VERDE		500		500	1,242	994	4,550	6,500	0.59
HORTALIZAS	150	150	150	250	1,500	1,200	700	1,000	2.00
MAÍZ AMILÁCEO	1,000	2,000	1,000	1,000	2,768	2,214	7,700	11,000	2.18
PAPA	780	1,080	780	300	6,638	5,311	12,600	18,000	0.55
PASTOS	850	950	950		3,301	2,281	30,800	44,000	0.22
TRIGO	100	100	100		1,725	1,380	1,190	1,700	1.47
JUNIN-5									
PASTOS	24	200	200		3,301	2,281	47,000	144,000	0.10
JUNIN-6									
ARVEJA GRANO S	0	5	5		3,929	3,143	2,300	4,140	0.99
ARVEJA GRANO V	5	9		9	4,652	3,722	2,300	6,840	0.92
AVENA GRANO		10		10	3,131	2,505		6,650	0.65
CEBADA	3	8	8		1,548	1,267	2,000	3,325	0.56
MAÍZ AMILÁCEO	0	5	5		2,768	2,214	2,000	3,230	0.95
PAPA	22	36	24	12	6,638	5,311	9,500	15,525	0.22
PASTOS	348	1,200	1,200		3,009	2,407	22,000	51,750	0.08
TRIGO	4	8	8		1,725	1,380	2,300	3,325	0.65
JUNIN-7									
CEBADA	50	110	75	35	1,583	1,266	2,200	3,000	0.70
HABA GRANO SEC	29	140	80	60	3,593	2,875	5,200	8,000	0.57
MAÍZ AMILÁCEO	54	175	110	65	5,257	4,206	10,000	14,500	0.45
PAPA	100	210	165	45	6,745	5,396	12,000	25,000	0.37
PASTOS	7	40	20	20	3,000	2,400	60,000	100,000	0.05
JUNIN-9									
ALFALFA	25	100	100		3,000	2,400	22,000	51,750	0.15
ARVEJA GRANO S	9	10		10	3,929	3,143	2,300	6,840	2.00
AVENA GRANO	9	10	10		3,131	2,505	2,300	4,140	0.22
CEBADA	7	10	10		1,583	1,266	2,000	3,325	0.98
HABA GRANO VEI	17	20		20	3,593	2,875	5,200	8,000	0.61
MAÍZ AMILÁCEO	17	20	20		5,257	4,206	2,000	3,230	2.22
MAIZ CHOCLO	18	20		20	1,061	849	8,500	9,000	0.84
PAPA	25	30	20	10	6,745	5,396	9,500	15,525	0.50
LA LIBERTAD									
LIB-1									
CAÑA DE AZUCAR	0	95	95		17,460	13,968		60,000	0.15
FRIJOL	0	32	25	7	1,890	1,567		1,300	1.91
FRUTALES	0	125	125		4,874	3,899		25,000	0.45
MAÍZ AMILÁCEO	0	92	85	7	1,940	1,552		1,500	0.92
TARA	0	185	185		2,500	2,198		1,700	1.56
LIB-4									
ARROZ	20				4,396	3,115	5,000		2.00
PAPRIKA	70				2,587	2,157	3,000		2.00
UVA	900	1,000	1,000		14,467	11,429	14,400	15,480	2.00
LIB-6									
CEBADA	250	500	250	250	1,580	1,238	1,000	1,800	1.08
HABA GRANO SEC	50	0			1,836	1,377	1,000	1,800	0.12
PAPA	300	700	350	350	6,200	4,650	10,000	18,000	0.41
TARWI	50	1,400	700	700	1,830	1,373	1,000	2,500	2.05
PIURA									
PIU-1									
FRIJOL	15	300	150	150	800	600	2,500	2,800	0.60
MAÍZ AMILÁCEO	30	400	200	200	1,500	1,125	2,700	3,000	0.60
PASTOS	30	150	150		1,900	1,425	10,000	12,000	0.20
PIU-2									
CAFÉ	150	250	250		2,800	2,128	450	600	6.34
CAÑA DE AZUCAR	50	150	150		4,000	3,040	18,750	25,000	0.20
FRIJOL	20	60	30	30	913	694	450	600	2.68
MAÍZ AMILÁCEO	20	60	30	30	913	694	1,125	1,500	0.64
NARANJO	10	20	20		1,500	1,359	2,350	2,800	0.60
PAPA	10	40	20	20	3,800	2,888	3,000	4,000	0.70
PASTOS	300	400	400		1,056	802	15,000	20,000	0.20
PLÁTANO	30	50	50		3,500	3,040	8,500	9,800	0.39
PIU-5									
CAÑA DE AZUCAR	30	88	88		4,000	3,040	5,500	6,325	0.80
FRIJOL	125	225	225		913	694	850	978	1.20
HORTALIZAS	62	122	102	20	1,577	1,199	8,000	9,200	0.25
MAÍZ AMILÁCEO	300	475	475		913	694	1,250	1,438	0.80
PAPA	50	180	140	40	4,277	3,251	10,000	11,500	0.45
PASTOS	125	210	210		1,056	802	23,000	26,450	0.05
TRIGO	15	145	105	40	1,025	779	1,500	1,725	0.74

UBICACION	VOLUMEN DE PRODUCCION ANUAL (KG)		COSTO DE LA PRODUCCION CON PROYECTO (S/.)		COSTO DE LA PRODUCCION SIN PROYECTO (S/.)		VALOR BRUTO DE LA PRODUCCION (S/.)	
	CON PROYECTO	SIN PROYECTO	PRECIO PRIVADO	PRECIO SOCIAL	PRECIO PRIVADO	PRECIO SOCIAL	CON PROYECTO	SIN PROYECTO
JUNIN-3								
ALCACHOFA	130,000	640,000	240,000	192,000	51,000	40,800	128,700	633,600
ARVEJA GRANO V	372,400	1,653,000	655,367	524,293	125,499	100,399	223,440	991,800
AVENA FORRAJEI	0	1,260,000	131,489	105,191	0	0	0	0
HABA GRANO VEI	450,000	1,219,500	336,582	269,266	105,570	84,456	157,500	426,825
HORTALIZAS	2,880,000	6,944,000	465,000	372,000	204,000	163,200	979,200	2,360,960
MAIZ CHOCLO	3,312,000	5,607,000	661,153	528,922	331,956	265,565	993,600	1,682,100
PAPA	0	3,084,000	1,706,046	1,364,837	0	0	0	2,313,000
PASTOS	504,000	3,000,000	85,000	68,000	30,345	24,276	55,440	330,000
JUNIN-4								
ALCACHOFA	38,199,000	54,570,000	19,260,000	15,408,000	16,371,000	13,096,800	77,543,970	110,777,100
ARVEJA GRANO S	987,000	1,410,000	3,693,279	2,954,623	3,139,287	2,511,430	1,974,000	2,820,000
AVENA FORRAJEI	637,000	910,000	219,148	175,318	186,275	149,020	140,140	200,200
FLORES	64,500	86,000	107,500	86,000	91,375	73,100	96,750	129,000
HABA GRANO SEC	554,400	792,000	815,760	594,370	693,396	505,214	887,040	1,267,200
HABA GRANO VEI	0	3,250,000	621,000	496,800	0	0	0	1,917,500
HORTALIZAS	105,000	150,000	225,000	180,000	191,250	153,000	105,000	150,000
MAÍZ AMILÁCEO	7,700,000	22,000,000	5,535,440	4,428,352	2,352,562	1,882,050	16,786,000	47,960,000
PAPA	9,828,000	19,440,000	7,169,375	5,735,500	4,401,200	3,520,960	5,405,400	10,692,000
PASTOS	26,180,000	41,800,000	3,136,121	2,167,017	2,385,103	1,648,073	5,759,600	9,196,000
TRIGO	119,000	170,000	172,540	138,032	146,659	117,327	174,930	249,900
JUNIN-5								
PASTOS	1,128,000	28,800,000	660,236	456,214	67,344	46,534	112,800	2,880,000
JUNIN-6								
ARVEJA GRANO S	0	20,700	19,645	15,716	0	0	0	20,493
ARVEJA GRANO V	11,500	61,560	46,523	37,218	0	0	10,580	56,635
AVENA GRANO	0	66,500	28,176	22,541	13,305	10,644	0	43,225
CEBADA	6,000	26,600	12,384	10,136	3,947	3,231	3,360	14,896
MAÍZ AMILÁCEO	0	16,150	13,839	11,071	0	0	0	15,343
PAPA	209,000	558,900	238,979	191,183	124,136	99,309	45,980	122,958
PASTOS	7,656,000	62,100,000	3,611,232	2,888,986	890,169	712,135	612,480	4,968,000
TRIGO	9,200	26,600	13,803	11,043	5,866	4,693	5,980	17,290
JUNIN-7								
CEBADA	110,000	330,000	174,108	139,286	67,269	53,815	77,000	231,000
HABA GRANO SEC	150,800	1,120,000	503,049	402,440	88,573	70,858	85,956	638,400
MAÍZ AMILÁCEO	540,000	2,537,500	919,980	735,984	0	0	243,000	1,141,875
PAPA	1,200,000	5,250,000	1,416,467	1,133,173	0	0	444,000	1,942,500
PASTOS	420,000	4,000,000	120,000	96,000	0	0	21,000	200,000
JUNIN-9								
ALFALFA	550,000	5,175,000	300,000	240,000	63,750	51,000	82,500	776,250
ARVEJA GRANO S	19,941	68,400	39,290	31,432	28,955	23,164	39,882	136,800
AVENA GRANO	19,941	41,400	31,307	25,045	23,072	18,457	4,387	9,108
CEBADA	14,000	33,250	15,828	12,662	9,418	7,534	13,720	32,585
HABA GRANO VEI	88,400	160,000	71,864	57,491	51,922	41,538	53,924	97,600
MAÍZ AMILÁCEO	34,000	64,600	105,141	84,112	75,964	60,771	75,480	143,412
MAIZ CHOCLO	153,000	180,000	21,225	16,980	16,237	12,990	128,520	151,200
PAPA	237,500	465,750	202,352	161,882	143,333	114,666	118,750	232,875
LA LIBERTAD								
LIB-1								
CAÑA DE AZUCAR	0	5,700,000	1,658,700	1,326,960	0	0	0	855,000
FRIJOL	0	41,600	60,480	50,144	0	0	0	79,622
FRUTALES	0	3,125,000	609,250	487,400	0	0	0	1,406,250
MAÍZ AMILÁCEO	0	138,000	178,480	142,784	0	0	0	126,960
TARA	0	314,500	462,500	406,630	0	0	0	490,620
LIB-4								
ARROZ	100,000	0	0	0	74,738	52,961	200,000	0
PAPRIKA	210,000	0	0	0	153,927	128,342	420,000	0
UVA	12,960,000	15,480,000	14,467,200	11,429,088	11,067,408	8,743,252	25,920,000	30,960,000
LIB-6								
CEBADA	250,000	900,000	790,000	619,000	335,750	263,075	270,000	972,000
HABA GRANO SEC	50,000	0	0	0	78,030	58,523	6,000	0
PAPA	3,000,000	12,600,000	4,340,000	3,255,000	1,581,000	1,185,750	1,230,000	5,166,000
TARWI	50,000	3,500,000	2,562,000	1,921,500	77,775	58,331	102,500	7,175,000
PIURA								
PIU-1								
FRIJOL	37,500	840,000	240,000	180,000	10,200	7,650	22,500	504,000
MAÍZ AMILÁCEO	81,000	1,200,000	600,000	450,000	38,250	28,688	48,600	720,000
PASTOS	300,000	1,800,000	285,000	213,750	48,450	36,338	60,000	360,000
PIU-2								
CAFÉ	67,500	150,000	700,000	532,000	357,000	271,320	427,950	951,000
CAÑA DE AZUCAR	937,500	3,750,000	600,000	456,000	170,000	129,200	187,500	750,000
FRIJOL	9,000	36,000	54,758	41,616	15,515	11,791	24,120	96,480
MAÍZ AMILÁCEO	22,500	90,000	54,758	41,616	15,515	11,791	14,400	57,600
NARANJO	23,500	56,000	30,000	27,180	12,750	11,552	14,100	33,600
PAPA	30,000	160,000	152,000	115,520	32,300	24,548	21,000	112,000
PASTOS	4,500,000	8,000,000	422,200	320,872	269,153	204,556	900,000	1,600,000
PLÁTANO	255,000	490,000	175,000	152,000	89,250	77,520	99,450	191,100
PIU-5								
CAÑA DE AZUCAR	165,000	556,600	352,000	267,520	102,000	77,520	132,000	445,280
FRIJOL	106,250	219,938	205,341	156,059	96,966	73,694	127,500	263,925
HORTALIZAS	496,000	1,122,400	192,394	146,219	83,108	63,162	124,000	280,600
MAÍZ AMILÁCEO	375,000	682,813	433,497	329,458	232,719	176,867	300,000	546,250
PAPA	500,000	2,070,000	769,860	585,094	181,773	138,147	225,000	931,500
PASTOS	2,875,000	5,554,500	221,655	168,458	112,147	85,232	143,750	277,725
TRIGO	22,500	250,125	148,625	112,955	13,069	9,932	16,650	185,093