

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

CENTER OF ECONOMIC RECONVERSION OF AZUAY, CAÑAR AND MORONA
SANTIAGO (CREA)

REPUBLIC OF ECUADOR

STUDY ON DEVELOPMENT FOR REACTIVATION
OF PRODUCTIVITY AND POVERTY REDUCTION
IN THE CENTRAL-SOUTHERN REGION
OF THE REPUBLIC OF ECUADOR

- FINAL REPORT -

AUGUST, 2005

PACIFIC CONSULTANTS INTERNATIONAL
NAIGAI ENGINEERING CO., LTD.

Exchange Rate (June, 2005)		
US\$1.00	=	Yen 107.35

PREFACE

In response to a request from the Government of the Republic of Ecuador, the Government of Japan decided to conduct a study on Development for Reactivation of Productivity and Poverty Reduction in the Central–Southern Region of the Republic of Ecuador and entrusted to the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr. Masayuki HONJO of Pacific Consultants International and consists of NAIGAI Engineering Co., LTD. between November 2002 and June 2005.

The team held discussions with the officials concerned of the Government of the Republic of Ecuador and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of this project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Ecuador for their close cooperation extended to the study.

August 2005

Etsuo KITAHARA
Deputy Vice President
Japan International Cooperation Agency

Mr. Etsuo Kitahara
Deputy Vice-President
Japan International Cooperation Agency

Transmittal Letter

We are glad to submit the Final Report of "The Study on Development for Reactivation of Productivity and Poverty Reduction in the Central-Southern Region of the Republic of Ecuador."

The Report consists of the master plan on the development of the study area which has been prepared in consideration of the advice and recommendation of relevant ministries of the Government of Japan and JICA on the formulation of the development plan, as well as the discussions with the members of the Ecuador Counterpart Team on the Draft Final Report, including their comments on the Report.

The Study Area is comprised by the Provinces of Azuay and Cañar and is located in the Andean Cordilleras running from north to south. There are many indigenous people who have not yet obtained appropriate policy support and have not cast off the traditional micro-agriculture of low productivity causing as a result, increased poverty in the area.

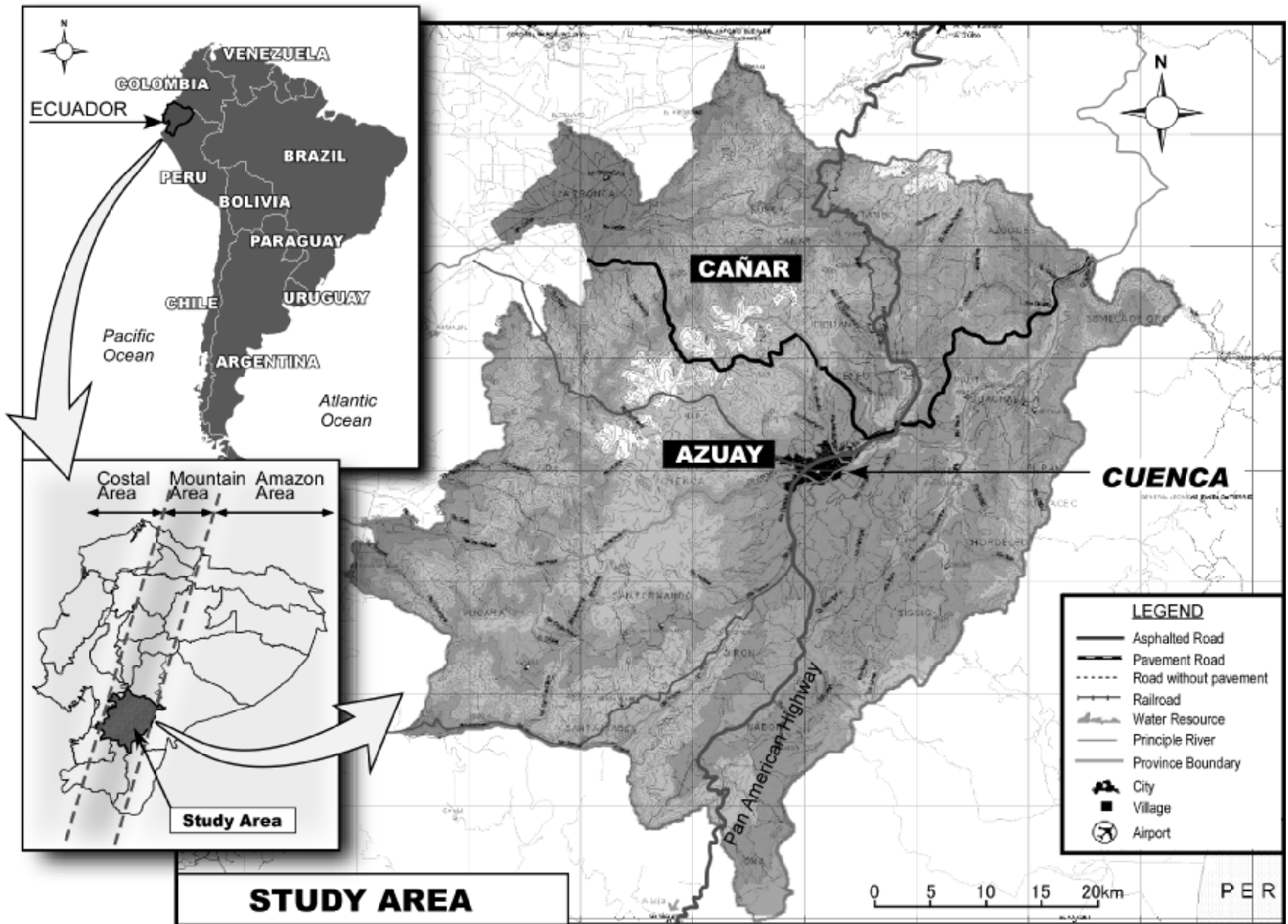
This master plan is based on a self-sustainable project, which is realized by the effective use of local resources for the mitigation of poverty in the area. We have proposed a plan with the appropriate financial and technical support in order to improve poverty step by step. We are convinced of the fact that the plan proposed in this report for the "Reactivation of Productivity and Poverty Reduction" will become a guide not only for the study area but it can also become a model for all the mountainous areas of the entire country of Ecuador.

In this report, we have configured five development components: "Upgrading of living standard", "Improvement of agriculture and livestock sector", "Activation of non-agriculture sector", "Environmental conservation", and "Functional strengthening of public supporting organization", and have proposed 13 projects as concrete action. These 13 proposed projects include six actual Pilot Projects, which obtain a high score in the aspect of poverty reduction and have as foundation the reactivation of productivity by the producers themselves. We are convinced that each project will perform highly in the reduction of poverty.

Taking this opportunity, we express our sincere gratitude to the officials of your agency, the ministry of Foreign Affairs and the Ministry of Agriculture, Forestry and Fisheries of the Government of Japan for their valuable advices and recommendations for our study. In the Republic of Ecuador, we are also grateful to the officials of the Center of Economic Reconversion of Azuay, Cañar and Morona Santiago (CREA), Autonomous National Institute of Agricultural and Livestock Research (INIAP) and people involved in the Study for their devoted cooperation and support during the implementation of the Study.

Sincerely yours,

Masayuki Honjo
Team Leader
The Study on Development for Reactivation of
Productivity and Poverty Reduction in the
Central-Southern Region of the Republic of Ecuador



STUDY ON DEVELOPMENT FOR REACTIVATION OF PRODUCTIVITY AND POVERTY REDUCTION IN THE CENTRAL-SOUTHERN REGION OF THE REPUBLIC OF ECUADOR (1)



SIGSIG PILOT PROJECT
Elaboration of the implementation plan carried out by the farmers (elaboration of the construction schedule for the irrigation works).



SIGSIG PILOT PROJECT
Construction of the Irrigation channel by *Minga* activity.



SUSCAL PILOT PROJECT
Community work for the cultivation of potato.



SUSCAL PILOT PROJECT
Training by INIAP (Use of Organic Fertilizer and Soil Improvement).



OÑA PILOT PROJECT
Breeding of *Cuys*.



OÑA PILOT PROJECT
Cultivation of Tomato Tree in a community plot.

STUDY ON DEVELOPMENT FOR REACTIVATION OF PRODUCTIVITY AND POVERTY REDUCTION IN THE CENTRAL-SOUTHERN REGION OF THE REPUBLIC OF ECUADOR (2)



CACHI PILOT PROJECT
Training



CACHI PILOT PROJECT
Electric fence and shepherding



BULAN PILOT PROJECT
Agro-industrial Center



BULAN PILOT PROJECT
Training for the production of preserves.



SAN GERARDO PILOT PROJECT
Quality control for milk



SAN GERARDO PILOT PROJECT
Cooling tank and collection of milk

STUDY ON DEVELOPMENT FOR REACTIVATION OF PRODUCTIVITY AND POVERTY REDUCTION IN THE CENTRAL-SOUTHERN REGION OF THE REPUBLIC OF ECUADOR (3)



Construction with material donated to CREA by the Grass-roots Granting-Aid Program by the Embassy of Japan



Joint project for the construction of an irrigation channel among residents and CREA through the Grass-roots Granting-Aid Program



Joint project for the excavation of the water channel among residents and CREA through the Grass-roots Granting-Aid Program



Research equipment donated to INIAP for the cultivation of Andean fruits by the Grass-roots Granting-Aid Program



Inspection visit of the Ambassador of Japan in Ecuador to the Grass-roots Granting-Aid Program



Presentation and discussion of the Draft Final Report in June, 2005

Summary

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STUDY ON DEVELOPMENT FOR REACTIVATION OF PRODUCTIVITY AND POVERTY REDUCTION IN THE CENTRAL-SOUTHERN REGION OF THE REPUBLIC OF ECUADOR

SUMMARY

1 General

1.1 Background of the Study

Ecuador, which is located right on the equator in South America, has a population of 12.16 million and a territorial extension of about 261 thousand sq. km. The economic structure of the nation is highly dependent on petroleum and gas sector as well as on overseas remittance made by migrant workers. Close to 40% of the nation's population live in rural area, engaging in subsistence farming. The poverty index is extremely high in rural area, especially in the mountainous region with an index of 74.5%. An accumulation of external debt (amounting to about 75% of the GDP) is a major source of anxiety and the Government of Ecuador is expected to make a rational allotment of the national budget as far as possible at a squeeze of budgetary fund.

Under the circumstances, the Project Formulation Study with focus laid on poverty reduction was carried out by Japan International Cooperation Agency (JICA) in January, 2001 and an agreement on conducting technical cooperation for formulation of a master plan for rural development plan that comprises, among others, cooperation with rural organizations and public supporting agencies, technical assistance relevant to farming activities and self-reliance of farmers. Following the said agreement, the present Study has been put into implementation.

The target areas under the present Master Plan have been identified as the provinces of Azuay and Cañar; these two provinces, which are located in steep mountain zone not suitable for conducting agricultural and livestock activities and are represented by small and marginal farmers, entail poverty factors that should be alleviated in Ecuador. The counterpart agency of the Study is CREA (The Center of Economic Recovery of the Azuay, Cañar and Morona Santiago), a public agency affiliated to the Ministry of Presidency, which is responsible for improving people in rural areas.

1.2 Objectives of the Study

The objectives of the Study are as follows:

- (1) To formulate a Master Plan for reducing poverty in the rural areas of Ecuador's Central-Southern region focused on the Provinces of Azuay and Cañar that fits the needs of the rural poor by identifying factors that impede solution of the problem.
- (2) To carry out technology transfer to the Ecuadorian counterparts in order to strengthen the capacity of the organizations concerned.

1.3 Study Area

The Study Area covers the Provinces of Azuay and Cañar in Ecuador (Territorial extension: 11, 175 km² and total population: about 810 thousand, of which rural population accounts for about 420 thousand)

1.4 Study Period

The Study was conducted from November 2002 to August 2005.

1.5 Study Methodology

The present Study has been carried out being divided into the following four phases. The outcome of the Study is compiled in this Report.

Table: Phases of the Study

Phases of the Study	Scope of the Study
Fact Finding of the Study Area	The potentials and constraints on development of the Study Area were compiled on the basis of fact finding on socio-economic conditions and on the prevailing situation of the agricultural and livestock sector as well as through analysis of poverty factors.
Formulation of the Master Plan	The Master Plan was formulated in accordance with the analysis on potentials and constraints on development of the Study Area.
Implementation of the Pilot Projects	A total of six pilot projects were carried out aiming at verifying measures for implementation of the Master Plan and monitoring on these pilot projects.
Formulation of the Master Plan	Review on the draft Master Plan was made in pursuance to the monitoring results of the pilot projects and the Master Plan was formulated.

2. Socio-economic Features of the Republic of Ecuador

2.1 General Characteristics of Ecuador

Principal socio-economic indicators of the Republic of Ecuador are as summarized hereinafter.

Table: Ecuador At a Glance

Land area	260,796 km ²
Land Use	Non-agricultural Use; 180,524 km ² (69.2%) Agricultural Use; 80,273 km ² (30.8%) Grazing land (62.5%), Arable land (23.6%), Fallow land (3.1%), Other Use (11.8%)
Demography	Total population (As of 2001) : 12,156,608 <ul style="list-style-type: none"> • Growth rate (1990~2001) : 2.10%/year • Birthrate : 3.39% • Male population : 6,018,353 (49.5%) • Female population : 6,138,255 (50.5%) • Urban population : 7,431,000 (61.1%) • Rural population : 4,725,000 (38.9%) • Illiteracy rate : 9.00% • Economically active population : 4,553,746 • Unemployment rate (As of December, 2000) : 10.30% • Incomplete employment rate: (As of December, 2000) : 49.90%
Economy (GDP)	<ul style="list-style-type: none"> • GDP (2001) : US\$ 20,500 million • GDP per capita (2001) : US\$ 1,564 • Import amount (2002) : US\$ 2,058 million • Export amount (2002) : US\$ 1,432 million
National Budget	<ul style="list-style-type: none"> • Fiscal budget in 2002 : US\$ 1,318 million • External debt : US\$ 15,400 million

Sources: VI Censo de poblacion, V de Vivienda (SIISE 3.5), III Censo Nacional Agropecuario, Banco Central de Ecuador, Sobre Informe de Desarrollo Humano (UNDP – Ecuador, 1999)

2.2 Socio-economic Conditions

The economic structure in Ecuador is represented by agricultural exports; coffee and cacao had been the major agricultural exports until the 1960s, and afterwards (1949 – 1950) it was represented by banana. Despite agricultural goods have maintained consistent production, their contribution to the national economy has been less significant as the exploitation of petroleum and gas has advanced.

In 2001, the GDP in Ecuador amounted to US\$ 20,500 million and the trade balance in 2002 was US\$ 626 million in deficit, with the imports of US\$ 2,058 million and the exports of US\$ 1,432 million. The sector of petroleum and gas accounted for 24% of the GDP and the Ecuadorian economy

is heavily influenced by the fluctuation of oil price at international market. Remittance from other countries is also major economic sector and its amount (US\$ 2,300 million) is almost equal to that of the manufacturing sector.

2.3 National Development Policies

In 2003, General Lucio Gutierrez came to office (and was substituted in May 2005 by President Palacios who maintained the same policy) announcing a National Government Plan for the period 2003 – 2007, which focuses on the following five policies, namely:

1. Combating corruption, impunity and social injustice.
2. Eradication of poverty and creation of new employment opportunity for jobless persons
3. Attainment of civil, social, juridical, food and environments security
4. Increased competitiveness through revitalization of productive activities and enhancement of productive ability of farmers
5. Structuring of modern nation through reform of international and national policies

2.4 Agricultural Sector

2.4.1 Agricultural Policies

The National Development Plan for 2003 – 2007 gave priority policies in the area of agricultural and livestock sector to: introduction of fiscal and marketing promotion measures aiming at sustainable revitalization of the agricultural and livestock sector, intensification of productive activities by fostering agricultural credit system and institutional supporting services, sustainable management of natural resources in line with land use plan, promotion of rural development with participation of rural organizations represented black and indigenous people and deepening of linkage between farmers and social organizations like public supporting agencies. As a plan of actions, strategies were forged with regard to five agendas: Competitiveness, International Negotiation, Rural, Agricultural and Livestock, Agro-forestry, Agro-industry and Irrigation System Developments, Food Security and Capacity Building of Public Supporting Agencies.

2.4.2 Performance of the Agricultural Sector

Table: Performance of the Agricultural Sector

Major Issues	Explanations
(1) Share to GDP by Sub-sectors of the Agricultural Sector	The agricultural sector absorbs close to 40% of the economically active population, but its productivity is extremely depressed with a contribution to the GDP as few as 8.4%. The majority of farmers engaged in farming of traditional crops and in raising of cattle and the products derived from these activities share only 3.8% of the GDP.
(2) Land Use by Purpose	Close to 2,970 thousand ha, equivalent to 24.1% of the national territory, are used as arable and grazing lands account for 4,490 thousand ha, 36.3% of the national territory.
(3) Major Agricultural and Livestock Products	The leading crops in Ecuador are composed of corn, rice, kidney beans (Frijoles); in Inter-Andean region corn, kidney bean, pea and potato are mainly cultivated, meanwhile permanent crops prevail in costal region. Livestock sector is represented by raising of cattle, swine and sheep. Cattle and sheep farming prevails in mountain region as well as rabbit and <i>cuy</i> raising.

2.5 Poverty

In Ecuador, higher income strata representing close to 20% of the total population account for 63.43% of the total income of the country, meanwhile poverty strata representing more than 20% of the total population, cover as small portion as 2.16% of the total population (Source: INEC, *Encuesta de Condiciones de Vida* 1995).

The poverty condition is defined in Ecuador, that poverty strata expended less than US\$ 55 monthly per person and extreme poverty strata expended below US\$ 28 per month.

The poverty strata in urban area cover 33% of the regional population in the Costa Region and 35% on Sierra Region, meanwhile that in rural area represented 72.7% and 74.5%, respectively. On the other hand, in the Oriente region, the proportion of poverty strata and extreme poverty strata represented 87% and 62.6%, respectively.

3. The Study Area

3.1 General Characteristics

3.1.1 General Characteristics of the Study Area

The Study Area consists of the provinces of Azuay and Cañar, which are located in the Inter-Andean or Sierra Belt, toward the south of the Ecuadorian territory, having combined land area of 11,175 km² and a total population of 810,000 as of 2001. The general features of the Study Area are as summarized below.

Table: General Characteristics of the Study Area

Description	Province of Azuay	Province of Cañar
Surface	<ul style="list-style-type: none"> Area: 8,020 Km² (3.1% of the country) Occupied by APU; 6,120 km² (76.3%) Other Areas: 1,900 km² (23.7%) 	<ul style="list-style-type: none"> 3,155 Km² (1.2% of the country). Occupied by APU; 2,582 km² (81.9%) Other Areas: 573 km² (19.1%)
Population	<ul style="list-style-type: none"> Total: 599,546 (4.9% of the country) Urban: 312,594 (52.1%) Rural: 286,952 (47.9%) Demographic density: 74.7 H/Km². Growth Rate (90/01): 1.6%/year 	<ul style="list-style-type: none"> Total: 206,981(1.7% of the country) Urban: 75,601(36.5%) Rural: 131,380 (63.5%) Demographic density: 65.6 H/Km². Growth Rate (90/01): 1.4%/year
Economic Structure	<ul style="list-style-type: none"> Contribution to the GDP: 5.43% (1996) Share of manufacturing companies: 3.45% of the country's total number 	<ul style="list-style-type: none"> Contribution to the GDP: 0.89% (1996) Share of manufacturing companies: 0.18% of the country's total number
Land Use	<ul style="list-style-type: none"> Arable land: 1,854 km² (23.1 %) Pasture: 1,875 km² (23.4%) Other Use:4,291 km² (53.5%) 	<ul style="list-style-type: none"> Arable land: 800 km² (25.2 %) Pasture: 684 km² (21.7 %) Other Use: 1,671 km² (53.1%)
Political Division	<ul style="list-style-type: none"> 15 Cantons (86 Parroquias) 	<ul style="list-style-type: none"> 7 Cantons (35 Parroquias)

Sources: VI Censo de Poblacion, V de Vivienda (SIISE 3.5)

3.1.2 Political Administration

Table: Summary of Political Administration

Description	Explanation
Political Division	Ecuador consists of 22 provinces, which, are divided into cantons, corresponding to cities or counties. Town; these cantons, in turn, are divided into parroquias, the lowest administrative bodies in the country, composed of various communities.
Administrative Organization	The administration organization in Ecuador is formed by 15 ministries within the central government, placing the Ministry of Presidency at the top of the ministries and establishing regional offices in each province. The Ministry of Presidency holds a couple of advisory councils and a bureau responsible directly for regional development is affiliated to the Ministry of Presidency. CREA, the implementation agency of the present Study, is one of the agencies under the direct control of the Ministry of presidency and undertakes regional development in Azuay, Cañar and Morena Santiago provinces. INIAP, a research institution belonging to the Ministry of Agriculture, is also present in the Study Area.
Public Services	The provinces of Azuay and Cañar are divided into eastern sector and western one by Molleturo Mountainous Range, which penetrates the provinces from north to south; western sector is featured by low population density, meanwhile the eastern sector has higher population density. Due to this geographic condition, social infrastructures have been developed on the eastern sector of the Molleturo Range.

3.1.3 Natural Conditions

The Study Area is scattered over land with an altitude ranging from 50 to 4,500 m.a.s.l., of which highland area exceeding 2,000 m.a.s.l occupies 75.6% of the total land area. The area is also located within the watershed of the Amazon basin and the Pacific Ocean basin. Due to the topographic condition, the climate of the area is diversified; mainly, tropical forest climate prevails in the lower land sector, meanwhile tropical highland climate dominates in the higher land sector. In so far as rainfall is concerned, higher precipitation is observed in the basins of the Jubones River and the Paute River. Generally speaking, lower precipitation season is in June thru September, transition season falls during October - January, and higher precipitation season coincides with the period February - May.

3.1.4 Socio-economic Condition

Table: Summary of Socio-economic Condition

Description	Explanation
(1) Demography	A distinctive demographic feature in the Study Area is that the proportion of female population is higher than the national average; against 50.5% of the national average, the said proportion is elevated to 51.7% in the Sierra Region and further ascends in the Study area to 53.3% in Azuay Province and 54.1% in Cañar Province. On the other hand, female population prevails in the urban sector throughout the country; meanwhile male population outstrips female population in the rural area. With regard to the Sierra Region, although female population excels male population in both urban and rural sectors, no distinctive difference is found between populations of both sexes. Finally, female population is higher in the rural area of Azuay and Cañar provinces in comparison with that in the urban area.
(2) Land Tenure	Landowners with farm size less than 5 ha represent more than 86.5% of the total landowners in the Study Area, which intimates that the majority of farmers in the area are composed of small and marginal farmers.
(3) Income Level	The total Regional GDP in the Study Area amounts to US\$ 131,897 thousand, divided into US\$ 99,633 in Azuay Province and US\$ 32,174 thousand in Cañar Province. The amount stemmed from non-agricultural sector represented by commercial activity in the City of Cuenca and other urban area and remittance made by local people working outside the region outstrips that of agricultural and livestock sectors in both provinces.
(4) Local Organization	Rural organizations relevant to irrigation, crop production, agro-industry, etc. are formed within communities. These organizations are acting as legally established organizations, being registered with public agencies anticipating their supports in financing and other aspects.

3.2 Industrial Sector

3.2.1 Agriculture and Livestock

Table: Summary of Present Conditions of Agriculture and Livestock

Major Issues	Explanations
(1) Land Use	The Study Area is located within a wide range of land elevation ranging from 50 to 4,500 m.a.s.l. and thus has a physical potential for cultivation of diversified cereals, vegetables, fruits, beans, root vegetables, flowers, medical plants, pastures and trees/shrubs. Actual land use of the Study Area is as given in the table below; 23.8% of the total land is used for crop cultivation, 22.9% for pasture and 10.2% for forests; about 41.9% of the total land is occupied by high plateau pasture. On the other hand, the region of the highlands where altitudes range from 3,000 to 3,500 m correspond to 41.9% of the total surface and since the soil and climate conditions are not favorable for agricultural and livestock activity, their use as productive land is quite difficult.
(2) Employees in the Agricultural and Livestock Sector	43.7% of the employees in the agriculture and livestock sector are represented by female employees and the proportion of female laborers excels that of male employees in four cantons: Cuenca, Sigsig, Biblian and Deleg. The number of the employees in the agriculture and livestock sector occupies 16.34% of the total population in two provinces.
(3) Agriculture and Livestock	The percentage of arable land with slope exceeding 20% that is not suitable for farm work and is at the same time vulnerable to land erosion accounts for 43.7% of the total area for arable land. On the other hand, lands with steep slope may be used as grazing land. Furthermore, lands with slope exceeding 10% that is not suitable for mechanized farming represent 53.2% of the total area for arable land and 58.2% for pasture.
a. Crop production	An output of crops is increasing in parallel with expansion of cultivated area. Nevertheless,

	productivity of crops is depressed in most of crops in comparison with other regions, attributable to lack of financial resources required for procurement of inputs, dependence on rain-fed tillage, conventional cropping practice, deficient input of fertilizers, inadequate cropping technology and so on. Thus, improvement and upgrading of cropping technology is a pressing agenda in farming activity of the area.
b. Livestock	Dairy production is the leading livestock activity. In general, small and marginal livestock farmers keep dairy cattle and set bulls produced through natural breeding for farm labor and for beef production. So as to raise productivity of dairy cattle, it is essential to introduce improved pasture, to renovate feeding system of conventional pasture with introduction of silo, to introduce more appropriate breeding technology and to employ more appropriate management practice for animal sanitation.
c. Marketing of agro-products	Marketing infrastructure within the Study Area is under-developed, so agro-products of small and marginal farmers are sold individually at the nearest small-scaled local markets. The similar situation is observed with regard to marketing of dairy products; small and marginal cattle farmers are forwarding milk without proper quality control

3.2.2 Non-Agricultural Sector

The industries other than agriculture such as commerce, hotels, restaurants and handicrafts, which are considered to be unconventional industries for the Study Area, have considerable impact on regional economy. In the province of Azuay, the agriculture sector, the leading industry, keeps the balance with non-agricultural industries in terms of economic impact. In the province of Cañar, on the other hand, the agricultural sector remains the leading industry and contributes considerably to creation of job opportunities.

3.3 Gender and Poverty

3.3.1 Gender

Table: Summary of Gender Related Issues

Major Issues	Explanations
(1) Domestic Position of Women within Household	There is a higher proportion of female head of household and in recent years more women tend to participate in the development of communities or cantons; in particular, at the cantons with higher proportion of men leaving as migrant workers, women are willing to be employed or to engage in small-scaled agricultural work for attaining income to sustain their family members. Meanwhile, even though at the cantons with relatively lower rate of exodus of male population as migrant workers, activity of women in rural area is diversified from looking after children to engaging in farm labor and their work load is significantly heavy.
(2) Proportion of Female Employees	The unemployment rate of the economically active population older than 12 years in Cuenca, capital of the Azuay Province, was 5.4% for men and 6.9% for women in 1988, but the same for women was elevated to 7.2% in 1996. According to the information on general labor market in the province of Azuay in 2002, the percentage of women having jobs was 53.1% of the women' economically active population older than 12 year and the remaining 46.9% were jobless or in seek of job opportunities, and similar incident has taken place in the province of Cañar.
(3) Female Organizations	Female organizations in the Study Area consist of association, cooperative, group activities and others. Although being under-developed administratively, the said organizations play an important role in routine life of rural women.
(4) Women's Participation in Rural Activities	The study carried out at the communities disclosed that an access and control by household are not biased neither to men nor to women and that the decision right within the household remains in parallel between both sexes. The participation rate of men at important meetings is higher than that of women, but an opposite result is observed in case of routine meetings.

3.3.2 Poverty Analysis

Table: Summary of Poverty Related Issues

Major Issues	Explanations
(1) Historical Background of Poverty	The poverty in the Sierra Belt Region is closely related with disadvantageous farming practice at limited and steep farmlands as well with depressed income level due to lack of alternatives for job opportunities other than agriculture-related activities. In addition, this depressed income level prevents local population from enjoying adequate standard of education and hygienic life, which, in turn, worsens productivity of farming activities, bringing about a vicious circle of poverty. This situation is especially the case at remote rural areas where more economically active people leave their places for urban area and overseas to settle there or to work as migrant workers, seeking more cash income.
(2) Prevailing Situation of Poverty	
a. Poverty at canton level	Of 22 cantons within the Study Area, the cantons with relatively high poverty indexes are located around the northern and southern borders of the provinces; meanwhile the city of Cuenca and its surrounding cantons are featured by relatively low poverty indexes.
b. Poverty analysis at parroquia level	Similar to the analysis at canton level, the parroquia with higher poverty indexes are located around the southern and northern borders of the Study Area. The parroquias located at the central part of canton are generally featured by relatively low poverty indexes and the farther a parroquia is located from the central part of canton, the higher is the poverty index.

3.4 Farmers in the Study Area

3.4.1 Socio-economic Features of Farmers

A survey on farmers at six (6) target communities of the pilot project was conducted in an attempt of fact finding on socio-economic conditions of farmers. The target communities together with their features and the target persons of the present survey are as given in the table below.

Table: Number of Family Member and Land Tenure Per Household

Description	Sigsig	Suscal	Oña	Cachi	Bulan	San Gerardo
No. of Family Member	4.0	6.2	3.5	3.6	5.2	5.1
Average farm (ha/family)	1.52	2.33	-	11.09	2.87	6.31
Arable land (ha/family)	0.70	0.49	-	0.98	0.58	0.66
Pasture (ha/family)	0.82	1.84	-	10.11	2.30	5.66

3.4.2 Farm Balance of the Surveyed Area

The survey was conducted targeting six (6) communities within the Study Area and the following results relevant to income and expenditure of farmers' household were revealed.

Table: Summary of Farm Balance of the Surveyed Area

Major Issues	Explanations
(1) Household Income	An average monthly income per person (including total family members) is US\$ 82.2 in the Study Area in general, which outstrips by far the poverty line in Ecuador, which is US\$ 55/month; the highest income falls on the area of San Gerardo and the income in the areas of Sigsig and Cachi is beyond the poverty line, in Oña income is right on the poverty line. Nevertheless, remittance by migrant workers, which is one of the characteristics of this area, has considerable weight. Among the 61 surveyed families, 22 of them received remittance from migrant workers and this represent a significant amount in the family household.
(2) Expenditure	An average yearly expenditure per capita in the Study Area amounted to US\$ 438, less than US\$ 40 per month. By item, food cost occupied the largest proportion with an amount of US\$ 240/year, or equivalent to nearly 55% of the total expenditure.
(3) Balance of Farm Household Economy	The balance of farm household economy resulted in surplus for all of surveyed farmers. By area, it was revealed that farm household income was more depressed in Sigsig, Suscal and Oña than the rest of areas; especially, the lowest income level falls on the area of Suscal in which farmers mainly engage in production of subsistence-oriented crops and maintain their household economy depending on income derived from non-agricultural activities (remittance to be made by their family members working outside the region). By contrast, farmers in the areas of Cachi, Bulan and San Gerardo enjoyed higher farm income with higher proportion of income from livestock activity.

3.4.3 Awareness of Farmers on Source of Poverty

The surveyed farmers as a whole are aware that poverty situation of the region incriminates depressed income, which is closely related with low productivity and profitability of agricultural and livestock sector, the leading industry of the region. This unsatisfactory situation of the sector in question may be attributable to under-development of productive infrastructure such as “Limited farm size” and “Steep slope” as well as to immature farm administration such as “Inadequate farming technologies”, “Deficient capital” and “Disadvantageous marketing condition”. In addition, lack of labor force caused by absence of male adults who have left seeking for employment opportunity outside the region constitutes one of the constraints on development of the region, and local people are not likely to appreciate the areas where remittance of overseas migrant workers accounts for greater portion of the income among farmers.

Table: Prevailing Characteristics and Major Constraints Identified by Farmers

Name of Area	Prevailing Agriculture and Livestock farming	Major Constraints Identified by Farmers
Sigsig	Combination of subsistence farming and diversification of cash crops	<ul style="list-style-type: none"> Insufficient supply of irrigation water to realize high-productive farming and farmers are not in a position of receiving technical extension services due to declined farm income.
Suscal	Subsistence farming	<ul style="list-style-type: none"> Absence of basic farming technologies such as deficient knowledge and technologies on introduction of crops varieties and pest control method suitable to natural conditions of the area.
Oña	Subsistence farming (Under irrigation)	<ul style="list-style-type: none"> Inadequate farming practice without rational use of existing small-scaled irrigation works and absence of cash crops and relevant farming technologies for forwarding products to major consumption center.
Bulan	Cultivation of cash crops	<ul style="list-style-type: none"> Absence of relatively advanced farming technologies on cultivation of high quality products and of proper measures in controlling marketing of products.
Cachi	Cattle farming	<ul style="list-style-type: none"> Basic factors such as depressed milk production per head of cattle due to deficient provision of feed and immature grazing practice (administration of grazing land, raising method, sanitary control of animals).
San Gerardo	Relatively advanced livestock farming within the Study Area	<ul style="list-style-type: none"> Marketing of products after production is their main problem. Relatively advanced administration method of cattle farming.

4 Basic Development Concepts

4.1 Potentials on Development

The potentials of the Study Area on intensification of productive activities and poverty reduction are summarized with regard to “Natural Environment” and “Socio-economy”, as described hereinafter.

Natural Environment:

The geography of the Study Area is advantageous as a base for supply of milk, dairy products and highland vegetables to the leading consumption centers in coastal area. And, in so far as environmental aspect is concerned, an analysis was made from the viewpoint of rational conservation of regional natural resources.

Social and Economic Conditions:

It is assessed that the Study Area enjoys socially high potentials, because trunk roads and electric supply networks are relatively developed and diligent attitude and willingness for cooperativeness of the local people are observed, which shall contribute to development of social infrastructure. On the other hand, as for economic potentials, a variety of natural condition of the Study Area, especially the climate suitable for agricultural and livestock production, contributes the area to raising farm income that is key factor for poverty reduction; besides, traditional handicraft industry represented by manufacturing of Panama hats creates employment opportunity, playing positive role in poverty reduction.

4.2 Constraints on Development

The constraints on development of the Study Area consists of: “Worsening of living conditions”, “Depressed farm income”, “Farmers’ income stemmed from nonagricultural sector is depressed” and “Exacerbated natural environment due to disordered land use” are rooted in lack of adequate institutional supporting services to the rural poor and in adherence of most of farmers to traditional low-productive farming. These constraints are analyzed by means of the “problems tree” in the following table.

Table: Problems Analysis

Poverty is not reduced/Productive activities are not intensified	Worsening of living conditions	Delayed development of basic infrastructure	Insufficient provision of supporting services of the Central Government		
			Allocation of budget for development under limited national budget is deficient and tends to decline.		
			Insufficient application of <i>Minga</i> -related activities		
		Rural society is being disrupted	Depopulation in rural area is in progress due to decline of labor force caused by emigration of adults as migrant workers	Lack of opportunities for employment	
				Range for <i>Minga</i> -related activities is limited	
		Ineffective use of overseas remittance from migrant worker	Lack of information on investment opportunities		
			Educational level is low		
	Depressed Farm Income	Low productivity in agriculture and livestock farming	Women engaging in a variety of activities play core role in farming		
			Ineffective land use	Rotational farming between crop production and livestock farming is not realized	
				Extensive crop cultivation prevails	
			Inadequate agricultural technologies and low productivity among small and marginal farmers	Extension services of CREA and INIAP are rendered in unsatisfactory manner	
				Conventional farming practice is predominant	
			Lowering in fertility of farmlands	Inadequate application of fertilizers	
		Improved varieties of crops are not introduced			
		Poor land conditions	Absence of diversification and combined farming in farm administration	Supporting services of CREA and INIAP are rendered in unsatisfactory manner	
				Lack of relevant information	
			The majority of farmers suffer from limited size of farmland located at slope area	Limited size of farmland	
	Ineffective use of agricultural and grazing lands				
	Lack of Infrastructure	Insufficient provision of government’s technical assistance			
		Unsatisfactory public supporting services under limited government budget			
		<i>Minga</i> -related activities are not conducted in effective manner			
Farmers’ income stemmed from nonagricultural sector is depressed	Under-development of competitive non-agricultural sector	Government’s budget is not sufficiently allocated to encourage the industrial sector			
		Absence of an organization in charge of promotion for strategic agro-products			
		Distribution of goods with other regions is not made smoothly	Marketing condition is unconsolidated		
			Cooperative forwarding of products is not realized		
			Heavy dependence of forwarding on middlemen		
			Absence of an organization in charge of marketing		
		Absence of agro-products in high repute	Compiled economic and marketing information are not used effectively		
	Adequate farming technologies on strategic agro-products are in need				
	Under-development of agro-products processing industry	No opportunity for value-added of agro-products			
		Under-development of marketing infrastructure			
Lack of opportunity for investment of capital	Unsatisfactory linkage among agriculture/livestock, processing industry and other industries				
	Absence of technology for manufacturing of high-value products				
Exacerbated Natural Environment due to Disordered Land Use	Disordered development of agricultural and grazing lands	Agricultural credit system is not adequately operated			
		Overseas remittance of migrant workers is not used effectively			
	Continuous practice of forest fire	Absence of land use plan according with land suitability			
		Environmental education is unsatisfactory			
	Insufficient reforestation	Lacks of investment fund for reforestation.			
		Reforestation methodology at economical cost is not introduced			
		Inefficient use of CREA’s facilities			
Inadequate management of farmlands	Combined farming of crop cultivation with cattle farming is not introduced				
	Farming oriented to soil conservation is not in practice				

The problems summarized in the following table: “Depressed farm income”, “Farmers’ income stemmed from nonagricultural sector is depressed”, “Worsening living conditions” and “Exacerbated natural environment due to disordered land use” are closely inter-related with insufficient provision of public supporting services and adherence of farmers to conventional farming practice suffered from low productivity. An allocation of budgetary allocation of the central government tends to be declined and it is presumed that financial support for the agricultural sector should be limited in the future. So as to attain poverty reduction, it is prerequisite to strengthen technical and financial assistance of the public sector to local people and to take measures for empowerment of local people for productive activities.

4.3 Basic Development Concepts

4.3.1 Conditions for Formulation of Basic Development Concepts

In order to realize the said measure related with poverty reduction through intensification of productive activity of small and marginal cattle farmers representing the majority of the destitute strata of the rural area, the development proposal shall be forged in compliance of the following development concepts. In due consideration of the fact that target farmers have limited land area and suffer from unfavorable soil conditions, drastic development attributable to considerable amount of investment cost would not be viable. In this connection, more feasible plans to be accepted by farmers without difficulty shall be proposed.

1. Integrated development to make effective use of physical potentials of the region
2. Development that would clearly identify the eligibility of beneficiaries
3. Development in which the population are the Main Actors with the support of the Public Sector
4. Development that efficiently utilizes the resources within the region
5. Sustainable development centered on the Community Organizations
6. Development considering Human Safety

4.3.2 Development Concepts and Proposed Projects

In due consideration of potentials and constraints on development as well as on the basis of the conditions for formulation of the basic development concepts, the basic developments shall be forged with regard to each one of the five components. Furthermore, development projects as substantial measures for the said components shall be designed.

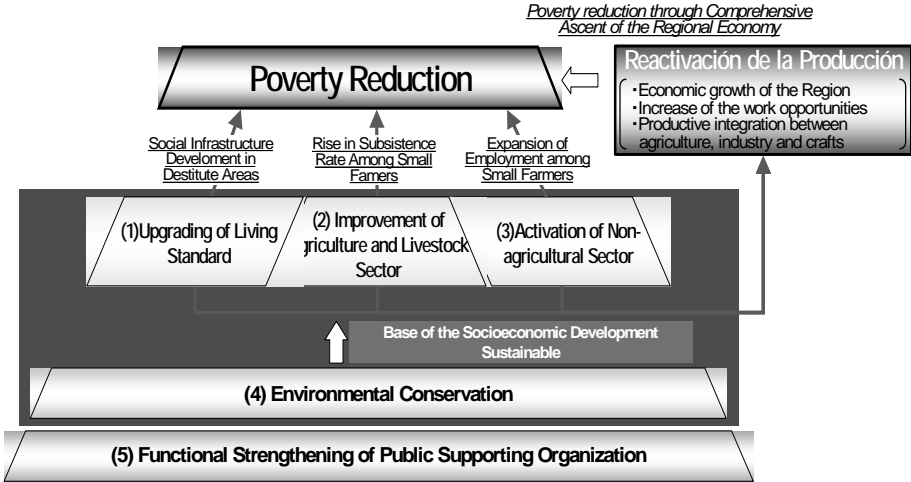


Figure: 5 Functional Strengthening of Public Supporting Organization

(1) Component for Upgrading Living Standard (Social and Economic Infrastructure Development)

Development of social infrastructure in urban area located within the cities of Cuenca and Azogues has reached a satisfactory level, meanwhile that in rural area still remains at depressed level. In this connection, development of social infrastructure shall be proceeded with emphasis laid on rural areas. For the implementation of social infrastructure with limited budgetary allocation in rural area where the cost-benefit ratio relevant to infrastructure development project is declined (fewer beneficiaries), it is of importance to save investment cost by fostering an involvement of the beneficiaries in substantial portion of development efforts and entrusting operation and maintenance task of completed facilities to them. In so far as development of irrigation system is concerned, participatory approach of the beneficiaries has been already employed, although implementation of related projects entails limited budgetary allocation and calls for efficiency in implementation.

Table: Specific Project of Component for Upgrading Living Standard

Projects	Descriptions.
<u>Specific Project:</u> Social and economic infrastructure development	The project of infrastructure development shall be implemented putting the beneficiaries at the focal position from the implementation to operation and maintenance. Public entities will summon the farmers' organizations on each phase of the project, thus making apparent the role of the beneficiaries.

(2) Component for Improvement of Agricultural and Livestock Activities

The agricultural sector in the Study Area holds serious problem from the viewpoint of productive base due to the fact that a number of farmers carry out crop farming at steep and extremely limited lands. By contrast, the region enjoys production of cash crops (fruits, vegetables and flowers) without difficulty under cool climate condition, peculiar characteristics of the Andean Region; such advantageous condition is not identified in surrounding regions. However, not all lands in the region can enjoy this merit because natural conditions of the region represented by climate and soil are diversified. Crop production areas thereby are divided into two categories according with profitability of crop production.

a. Basic development concepts on low productive farming

Cultivation of subsistence-oriented crops, raising of cattle and production of milk are prevalent at present in destitute region, but the output of crops and processed products of livestock (meat, milk and cheese) do not satisfy subsistence farmers' family. On the other hand, so as to diversify crops farming pattern by introducing cash crops other than potato, it is a prerequisite to employ advanced farming technologies and marketing strategies as well as to arrange productive infrastructure represented by irrigation system; it is less viable to realize this attempt due to constraints relevant to natural and socio-economic conditions, if considerable supports from the public sector should not be rendered. Taking these circumstances into consideration, an increase in output of subsistence-oriented crops shall constitute the basic development concept in poverty-predominant areas.

Table: Specific Project for Low Productive Farming of Component for Improvement of Agricultural Activities

Projects	Descriptions.
<u>Specific Project:</u> Upgrading of subsistence-oriented agro-products	Most of farmers in the region are not in a position to attain crop production sufficient enough to satisfy the demand of foodstuff for their family members. Hence it is possible that small and marginal farmers should employ non-conventional farming technologies through introduction of hybrid varieties of crops (like potato), which, in turn, shall contribute directly to rise in farm income.
<u>Specific Project:</u> Raising farmer's income	Introduction of improved species of <i>cuy</i> and upgrading in production of Andean fruits. An increase in output of subsistence-oriented agro-products. Raising of small animals can be expected to gain higher profit at lowered cost and, in addition, an expansion of relevant technology and extension of improved species shall be attained.
<u>Specific Project:</u> Improvement of milk productivity among marginal cattle farmers	Introduction of improved varieties of pasture, renovation of feeding system, strengthening in sanitary control of animals, among the marginal livestock farmers through the implementation of the Project in order to increase milk production with relative easiness.

b. Basic development concept on high productive farming

In the area extending over the basin of the Paute River, high productive farming is realized with cultivation of flowers, fruits and vegetables. However, competitiveness of the said products at the markets is likely to decline as a consequence of invasion of similar products from neighboring countries in these days. On the other hand, livestock activity is represented by dairy production, which prevails in and around the outskirts of urban area, enjoying better access to trunk roads.

Under these circumstances, upgrading of quality and lowering of production cost for cash crops, in particular fruits and flowers, as well as improved quality and consistent production of dairy producers are a pressing issue to be tackled with.

Table: Specific Project for High Productive Farming of Component for Improvement of Agricultural Activities

Projects	Descriptions.
<u>Specific Project:</u> Support to cash crops production	Due to physical potentials, cash crops in the Study Area are represented by Andean fruits, flowers and vegetables. However, there remain considerable margins for improvement, especially quality of products and unit yield. upgrading of quality in products shall be attained subject to being rendered technical extension services and provision of productive infrastructure, while strengthening and expanding the functions of farmers' association.
<u>Specific Project:</u> Improvement for marketing of dairy products.	Because raw milk produced by small cattle farmers is stored at a normal temperature and is forwarded to processing industries, so retailers give low-priced as inferior quality products. In sum, an introduction of refrigerated storage is directly contributing to boosting the farm-gate price.

(3) Component for Activation of Non-agricultural Sector

The agriculture and livestock sector in the Study Area produces considerable amount of raw materials represented by Andean fruits and milk to be provided to agro-products processing industry. Up to date, processing industry, however, has been under-developed within the Study Area and agro-industry has scarcely established. In addition, processing of raw milk remains at inferior level, without bestowing high value-added on the products. On the other hand, no active industry other than agriculture is found in the rural area, so creation of new employment opportunity among destitute strata is anticipated with introduction of non-conventional industry.

Aiming at creation of new employment opportunity and revitalization of non-agricultural sector within the region through processing Andean fruits and raw milk, an introduction of processing industry in close linkage with agricultural and livestock shall be promoted.

Table: Specific Project of Component for Activation of Non-agricultural Sector

Projects	Descriptions.
<u>Specific Project:</u> Encouragement of agro-products processing industry	A variety of specific agro-products is produced in the Study Area, basing on the characteristics of the Andean Region. In this connection, it is highly anticipated that value-added of the agro-products in the region should be boosted by making linkage of the agro-products with processing industry. Besides, introduction of agro-industry there is of importance in terms of creation of new employment opportunity.
<u>Specific Project:</u> Encouragement of dairy products processing industry	The Study Area is a milk production area, but most of raw milk is processed at small-scaled and old-fashioned industries, depressing value-added of processed products and providing limited opportunity of employment. Under this situation, aiming at elevating value-added of dairy products, the nominated project shall be implemented.
<u>Specific Project:</u> Encouragement of rural handicraft manufacturing industry	Contrary to the development of tourism industry, the circumstance around handicrafts industry, one of the tourism-related resources, is under-developed and there remains room for strengthening the industry in such manners as raising production efficiency, intensification of market research to grasp the needs at markets (Design, size, etc.) and concentration in production targeting specialties of the region. An implementation of the nominated project is thus proposed so as to upgrade the quality of craft products/handicrafts and to improve production efficiency.

(4) Component for Environmental Conservation

Deforestation is accelerated within the Study Area due to expansion of farmlands at steep slopes where farming activities face difficulty. There is fear that this accelerated deforestation would bring about

soil erosion and deterioration in capability of lands for cultivation of water resources. Soil conservation can assure productive activities for the farmers and therefore it is an activity that should be carried on continuously.

Under the circumstances, promotion of reforestation projects and strengthening of environmental education become a pressing agenda in order to tackle with environmental conservation more aggressively. For achievement of the said goals, a linkage among agencies involved in environmental matters and clear demarcation of responsibilities among concerned agencies is a prerequisite.

Table: Specific Project of Component for Environmental Conservation

Projects	Descriptions.
<u>Specific Project:</u> Promotion for reforestation	It is suggested that the reforestation project within the Study Area should be put into implementation comprehensively by CREA which is equipped with the necessary facilities and holds a number of qualified personnel.
<u>Specific Project:</u> Strengthening of environmental education	It is indispensable that people should pay attention to the natural environment and be aware of the importance for protection and conservation of natural resources. In this regard, the Project: "Strengthening of environmental education" shall be implemented, targeting its beneficiaries.

(5) Component for the Functional Strengthening of Public Supporting Agencies

Support to small-scaled industries within the Study Area is rendered by public agencies, universities, NGOs, etc., of which CREA and INIAP play a central role under limited manpower and budgetary allocation. CREA and INIAP are also expected to play as core organizations in implementation of projects/programs included in the present Master Plan. In this connection, review on actual scope of services of these two agencies and functional strengthening with concentration of their resources on focal roles shall be proceeded aiming at their capacity building.

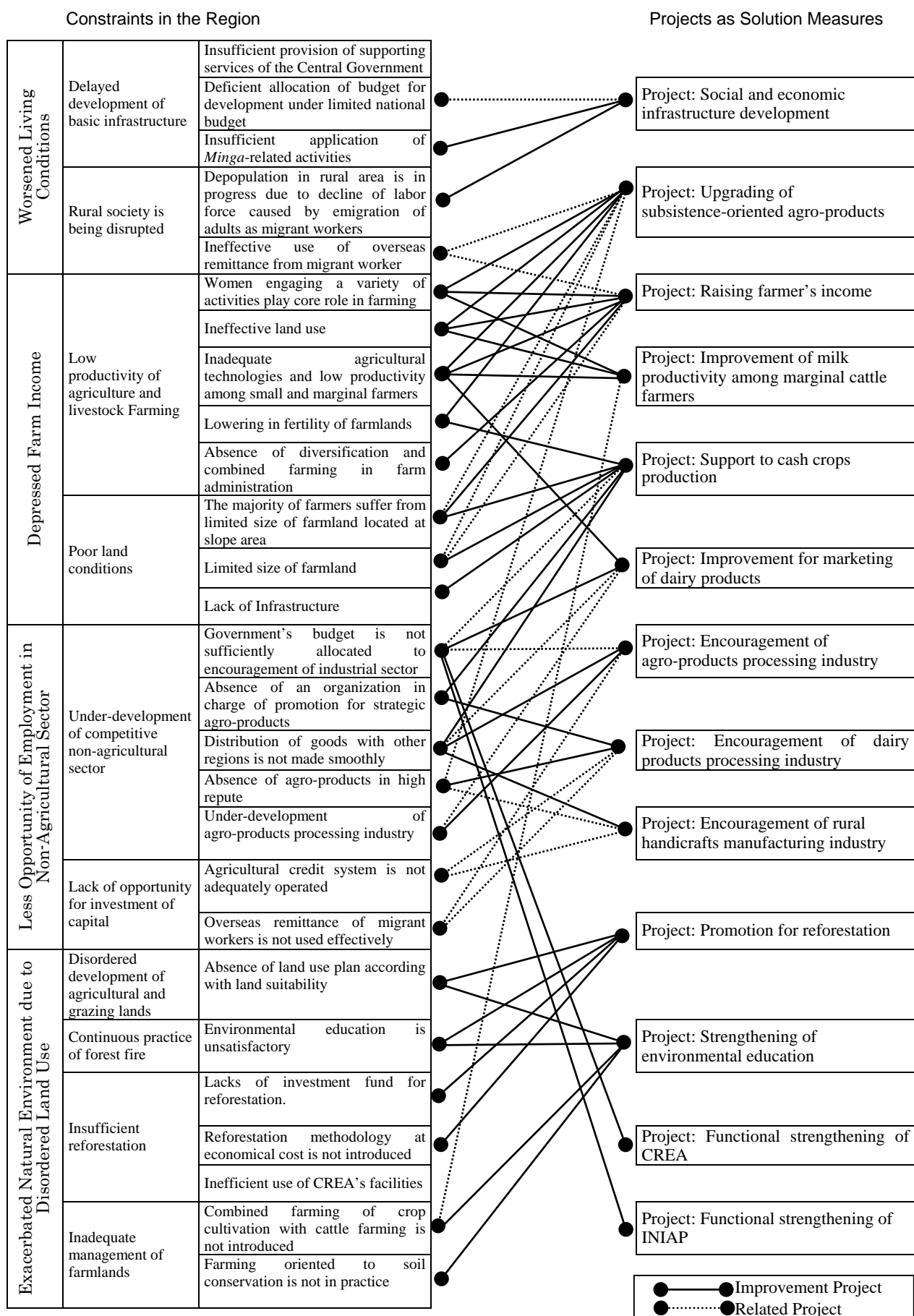
Table: Specific Project of Component: Functional Strengthening of Public Supporting Agencies

Projects	Descriptions.
<u>Specific Project:</u> Functional strengthening of CREA	CREA's services relevant to agriculture, livestock and forestry cover comprehensive activities of agriculture and livestock and reforestation. For involvement in this Master Plan, emphasis in intensification of services shall be laid on technical assistance to cattle farmers.
<u>Specific Project:</u> Functional strengthening of INIAP	As for subsistence farming, development of relevant technologies in due consideration of prevailing inferior technological level as well as depressed profitability of target farming system, together with extension system of these technologies shall be structured. For this purpose, intensification in research and investigation tasks and training of personnel in charge of extension services is necessary.

4.4 Relationship between Each Project and Prevailing Constraints of the Region

As mentioned above, development projects have been forged in compliance with respective development concept, and implementation of these projects is expected to contribute to easing and overcoming prevailing constraints related with poverty situation and stagnant productive activities. As indicated in the table below, each project is inter-related with a couple of development components and shall have positive impact on solving various problems.

Table: Relationship between Each Project and Prevailing Constraints of the Region



4.5 Strategy for the Implementation of the Master Plan

As the strategy for attainment of upper targets of the Master Plan: “Reactivation of productive activities” and “Poverty reduction”, the development components and concrete projects have been laid down by the previous sub-chapters. The present sub-chapter will examine necessary measures to attain the development components and scenario for implementing the projects, with development agendas acceptable for the beneficiaries and their implementation procedures considering the local resources and farmers’ assets.

4.5.1 Strategy and Scenario for the Master Plan

(1) Strategy for Attainment of Upper Targets

The strategy to attain the upper targets for the “Introduction of measures for raising productivity of subsistence-oriented agro-products”, “Introduction of measures for raising farmer’s income”, “Strengthening agro-products to have more competitiveness”, “Introduction of agriculture and livestock activities to be easily engaged by women” and “Introduction of sustainable agricultural and livestock farming”, as well as “Introduction of measures for reactivation of farmers and rural organizations activities”.

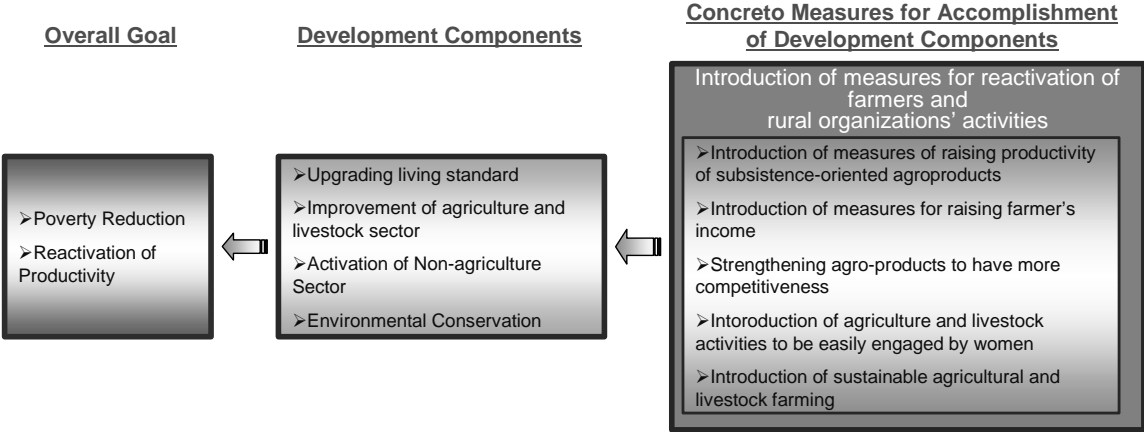


Figure: Strategy for Attainment of Upper Targets

(2) Scenario for Reactivation of Productive Activities and Poverty Reduction

For the strategy to attain the upper targets, it is a prerequisite to promote spontaneous activities of farmers/farmers’ organizations, as well as financial and technical supports directed to farmers to be rendered by public institutions. In the light of this, the present Master Plan defines clearly “The role to be undertaken by farmers/farmers’ organizations” and on the basis of the same “The responsibilities to be taken by public institutions” shall be proposed. The process for the scenario for “Reactivation of productive activities and poverty reduction” is illustrated as follows:

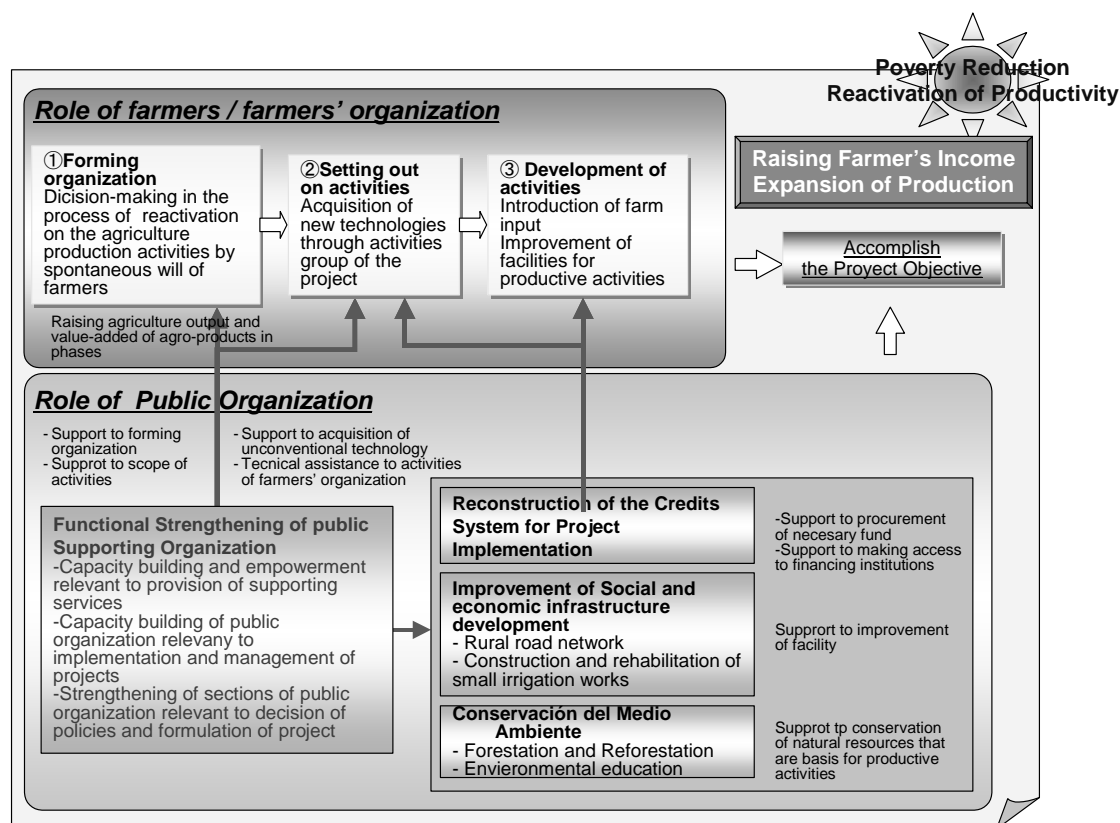


Figure: Scenario for Reactivation of Productive Activity and Poverty Reduction

4.5.2 Development Agenda and Implementation Procedure

In line with the scenario for attainment of the upper goals of the Master Plan, the implementation order of development agenda was decided in due consideration of the ability of target beneficiaries (Regional reactivation level) in the following manner.

Table: Development Agenda and Implementation Procedure

Development Agenda	Implementation Procedure	Descriptions
Development agenda directly contributing to raising farmer's income	Consistent production	Targeting small and marginal farmers who are not in a position to have farm production to satisfy their family members, to secure consistent agricultural and livestock production by means of introduction of unconventional farming technologies.
	Expansion of production	Targeting farmers who have realized consistent agricultural and livestock production, to expand their farm production owing to improvement of farming technologies depending on their own fund or on loan with depressed financing condition, aiming at raising their income.
	Improvement of collection and forwarding of agro-products	Even though consistent and expansive production should be attained, regional development shall remain limited in an absence of adequate collection and forwarding system including sales network of agro-products. Apart from such situation, arrangement in forwarding amount of agro-products is required for avoiding sharp drop in price. Under the circumstances, improvement of collection and forwarding of agro-products is a prerequisite for securing adequate sales network.
	Higher value-added of agro-products	In pursuance of higher grade for reactivation of regional economy, the development component: "Activation of non-agricultural sector" comprising development of agro-industry with use of regional agro-products and promotion of handcraft manufacturing shall be put into implementation. It is expected that this attempt shall bring about improving competitiveness of regional agro-products, creation of employment opportunity and raising farmer's income and shall contribute to regional development.

Development agenda needed public investment	Social and economic infrastructure development	In order to tackle with the development agenda contributing directly to raising farmer's income, social and economic infrastructure is an indispensable factor. The development component: "Social and economic infrastructure development" comprising such components as small-scaled irrigation works, rural roads network, etc that can not be realized depending exclusively on own fund of farmers/farmers' organizations but entail public investments shall be implemented from the beginning of the Master Plan relying on continuous supports of the public sector.
	Environmental conservation	The development component: "Environmental conservation", which is highly public-oriented comprising reforestation project and provision of environmental education, is currently implemented continuously by the public sector. The present Master Plan shall hasten relevant activity.
	Functional strengthening of implementation agencies	The above-mentioned agenda shall not be materialized without participation of farmers and support of public organization. It is thus proposed to strengthen capacity of public organizations with regard to implementation of projects and provision of technical assistance to farmers.

Regarding the "Development agenda directly contributing to raising farmer's income", "component for improving agriculture and livestock" which consists of "consistent production", "expansion of production" and "Improvement of collection and forwarding system of agro-products", as poor farmers are looking for, should have the highest priority. Beneficiaries having accomplished these are going to apply "on-agricultural industry component" which will aim to approach higher value-added products to proceed to upper goals.

"Social and economic infrastructure development", "Environmental conservation" and "Functional strengthening of public supporting organization" which belong to "development agenda depending on public investment", shall be a precondition to attain "development agenda directly contributing to raising farmer's income". Hence such agenda has to be implemented continuously from the beginning of the Master Plan.

4.5.3 Specific Projects to Attain Upper Targets of the Master Plan

The table below summarizes the development agenda to have been forged for attainment of upper targets of the Master Plan together with development components and specific projects to have been proposed in line with the said development agenda.

Table: Specific Project for Attainment of Upper Targets of the Master Plan

Development Agenda	Development Components	Specific Project
Consistent production Expansion of production Improvement of collection and forwarding system of agro-products	Improvement of agriculture and livestock sector	<ul style="list-style-type: none"> • Upgrading of subsistence-oriented agro-products • Raising farmer's income • Improvement of milk productivity among marginal farmers • Support to cash crops production • Improvement for marketing of dairy products
Higher value-added of agro-products	Activation of non-agricultural sector	<ul style="list-style-type: none"> • Encouragement of agro-products processing industry • Encouragement of dairy products processing industry • Encouragement of rural handicraft manufacturing industry
Social and economic infrastructure development	Upgrading of living standard	<ul style="list-style-type: none"> • Social and economic infrastructure development
Environmental conservation	Environmental conservation	<ul style="list-style-type: none"> • Promotion for reforestation • Strengthening of environmental education
Functional strengthening of public supporting organization	Capacity building of public supporting organization	<ul style="list-style-type: none"> • Functional strengthening of CREA • Functional strengthening of INIAP

4.5.4 Main Issues in Implementation of Projects

In implementation of projects aiming at poverty reduction through intensification of productive activities in Southern Sierra Region, the following issues shall be taken into consideration.

Table: Main Issues in Implementation of Projects

Major Considerable Aspect		Descriptions
Implementation of Sustainable and Efficient Projects	Sustainability of Projects	It is required to design a mechanism seeking for reduction of the project inputs (capital and materials/machinery, etc.) as far as possible; following this policy, in the projects benefiting directly farmers, such inputs as fund, seeds, fertilizers shall be procured on loan and shall be repaid obligatorily and thus repaid capital, in turn, shall be earmarked for investment of next candidate area.
	Efficiency of Projects (Technical aspect)	Because the development projects aiming at poverty reduction included in the present Master Plan comprises a variety of supporting services to be rendered by public agencies, any measures should be implemented in close linkage among concerned agencies and with an employment of multilateral approach.
	Efficiency of Projects (Financial aspect)	In so far as the projects which target directly farmers or farmers' association are concerned, part of their the investment cost shall be charged to these beneficiaries, and all the projects thereby should be implemented with procurement of investment cost on loan. In this connection, "Arrangement of financing system to support small and medium farmers from financial side" is considered as basic and indispensable project for implementation of development projects. Nevertheless, due to the fact many projects included in the Master Plan shall be designed aiming at contributing to poverty reduction in considerable manner, the scope of projects should be divided rationally into the proportion on loan (loan conditions such as interest rate, etc.).
Implementation of Projects with Participatory Approach of Beneficiaries		In order to attain sustainable development of projects, the participation of beneficiaries in the process of operation and maintenance of projects is critical, apart from supporting services of the public sector.
Implementation of Environmental Conservation Projects with Reforestation as Core Component		Countermeasures against soil erosion in the Study Area consist of the reforestation for productive activities at depopulated areas like mountainous zone and the reforestation for conservation of land resources; the former shall be undertaken by the government of Ecuador as a central implementation body, meanwhile the latter shall be implemented by farmers who shall play the focal role. It should be noted that implementation of reforestation project solely is not economically feasible because proposed benefits stemmed from this attempt do not profit raising income of farmers in a short run. It is thus suggested to put small-scaled reforestation project into implementation jointly with other projects aiming at increase in output of agricultural and livestock production.

4.5.5 Classification of Projects

(1) Classification of Projects according to Purpose

An attempt leading to poverty reduction in the Study Area is suggested to employ participatory approach of beneficiaries so as to have elevated effects, raised sustainability and reduced investment cost of projects. A total of thirteen (13) projects to be formulated in compliance with basic development concepts may be classified into four (4) categories.

Table: Classification of Projects according to Purpose

Categories	Development Components	Projects
Projects directly contribute to raising farmer's income	<ul style="list-style-type: none"> Improvement of agriculture and livestock sector 	<ul style="list-style-type: none"> Upgrading of subsistence-oriented agro-products Raising farmer's income Improvement of milk productivity among marginal farmers Support to cash crops production Improvement for marketing of dairy products
	<ul style="list-style-type: none"> Activation of non-agricultural sector 	<ul style="list-style-type: none"> Encouragement of agro-products processing industry Encouragement of dairy products processing industry Encouragement of rural handicraft manufacturing industry
Projects aiming at functional strengthening of public supporting agencies	<ul style="list-style-type: none"> Upgrading of living standard 	<ul style="list-style-type: none"> Social and economic infrastructure development
Projects to be implemented under public investment program	<ul style="list-style-type: none"> Environmental conservation 	<ul style="list-style-type: none"> Promotion for reforestation Strengthening of environmental education
Projects related with sustainable improvement of environment	<ul style="list-style-type: none"> Capacity building of public supporting organization 	<ul style="list-style-type: none"> Functional strengthening of CREA Functional strengthening of INIAP

(2) Classification of Project by Source of Fund

For implementation of projects, financing of necessary fund is a precondition for both public supporting organization and farmers. In particular, destitute farmers face difficulty to access the private financing institutions by themselves, therefore an introduction of financing system is envisaged as a component of the projects. The said financing system to be introduced consists of micro-credit, financing to entrepreneurs and public investment and shall be categorized by project.

Table: Classification of Project by Source of Fund

Classification of Project by Source of Fund	Descriptions
a. Micro-credit	The projects related with the component: "Improvement of Agriculture and Livestock Sector", which have a purpose to alleviate poverty, aim at consistent output of subsistence-oriented crops and raising farm income among small and marginal farmers attributable to improvement of productivity and expansion of agricultural and livestock production. The investment required for these projects is relatively depressed with economical needs and agricultural inputs and satisfactory benefits corresponding to such investment shall be anticipated. For this kind of enterprise that entails relatively depressed investment cost and has a wide range of beneficiaries, micro-credit system shall be introduced.
b. Financing to entrepreneurs	The component: "Encouragement of non-agricultural sector" seeks for attainment of higher value-added of local agro-products and comprises introduction of processing facilities and equipment for raising profitability. The investment cost for the projects included in this component is relatively elevated, but higher benefit is also expected. Necessary fund for this enterprise shall be procured by participatory entrepreneurs through private financing institutions. Financing for the above-mentioned enterprise shall be made under solo responsibility of farmers/farmers' organization, so the public sector shall not intervene in this process.
c. Public investment	Public investment shall be allocated to the projects such as economic infrastructure as irrigation works and social infrastructure such as the water supply system, which require larger amounts for implementation.

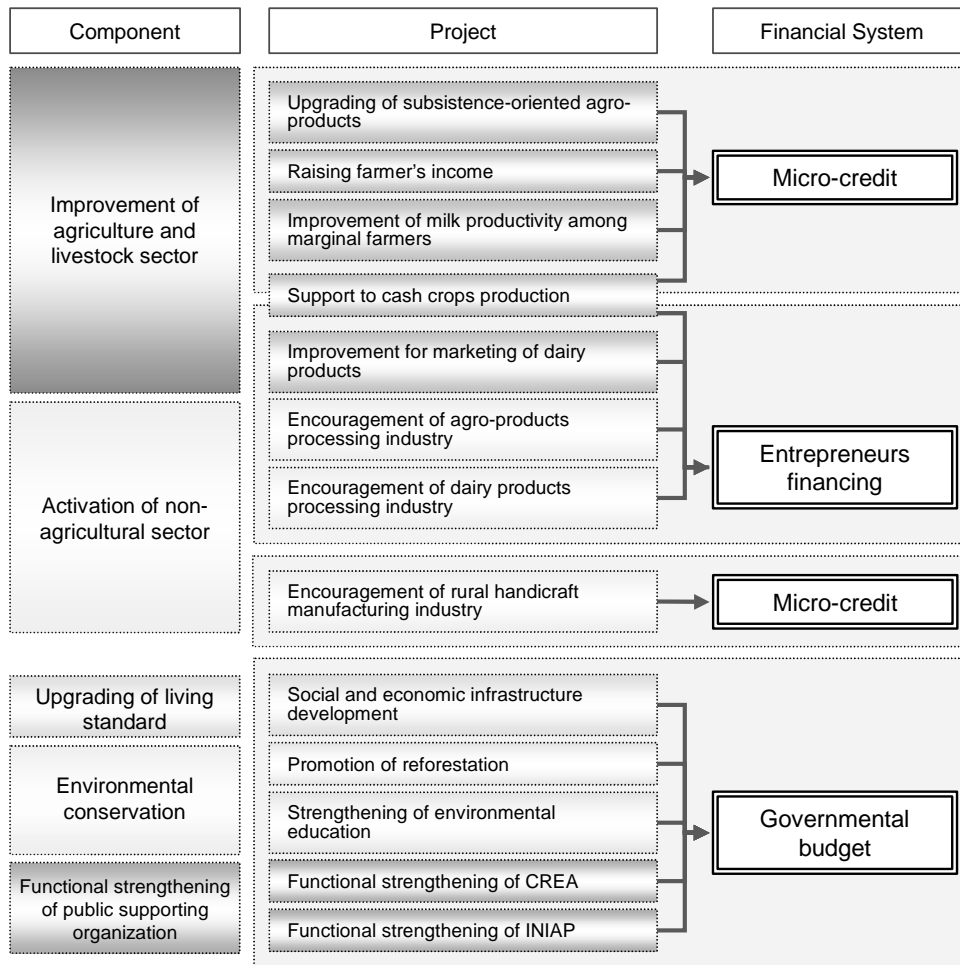


Figure: Classification of Project by Source of Fund

5. Pilot Projects

In an attempt to verify proposed measures for development of potentials, pilot projects aiming at (1) Social and economic infrastructure development, (2) Upgrading of subsistence-oriented agro-products, (3) Raising farmer's income, (4) Improvement of milk productivity among marginal cattle farmers, (5) Support to cash crops and encouragement of agro-industry, and (6) Improvement for marketing of dairy products. The scope of the works for each pilot project together with their evaluation results is as described hereinafter.

5.1 Sigsig Area (Social and Economic Infrastructure Development)

With a target to benefit a total of 142 farmers in Sigsig Area, development of irrigation system by beneficiaries through *Minga*-related activities was carried out, in collaboration with CREA, Sigsig Municipal Government and water users' association. The goals, activities and inputs of this project are as summarized below.

Table: Summary of Pilot Project in Sigsig Area

Purposes	<ul style="list-style-type: none"> • Establishment of project implementation system with involvement of <i>Minga</i>-related activities in project, as a measure to save investment cost. • Implementation of public works with involvement of <i>Minga</i>-related activities. • Operation and maintenance of completed works by beneficiaries. • Establishment of water users' association and designing and implementation of water management task by water users' association, as focal responsible entity. • Technical assistance by CREA with regard to construction and operation/maintenance of irrigation system. • Implementation of construction works in linkage with local governments
Activities	<ul style="list-style-type: none"> • CREA: Design and civil works with use of construction equipment, supply of materials for irrigation system (Study Team) • Local governments: Bear partial portion of investment cost. • Water users' association: Manual-labored civil works and installation of pipes.
Inputs	<ul style="list-style-type: none"> • Planning and construction of secondary canals: Distribution pipes to the communities of Gutun, Tullupmna and Narig. • Seeding of blackberry (About 50 units for each farmer) • Technical transfer and support to associations • Construction machinery, design, construction supervision and cost for holding seminar.

As a fruit of this pilot project, construction of irrigation system, which has been carried out little by little for a long time, has made remarkable progress, together with elevated proportion of local people participating in *Minga*-related activities. Thanks to provision of appropriate supports to satisfy the needs of local people (supply of construction machinery and materials), a sense of purpose and willingness for participation of development efforts among local people were raised and it was proved that implementation of a project which was anticipated by local people was viable with depressed investment cost.

The total investment cost for this irrigation system (roughly estimated at US\$ 1 million) was divided into: about US\$ 100 thousand (10% of the total cost) for supply of materials, 70% of the total cost for use of construction machinery belonging to CREA, and 20% of the total cost for provision of labor force by beneficiaries. It was revealed that development of infrastructure to satisfy the needs of local people with participation of beneficiaries and depressed investment cost was viable subject to input of construction machinery possessed by local development agencies.

5.2 Suscal Area (Upgrading of Subsistence-oriented Agro-products)

The possibility for increase in output of agricultural products among small and marginal farmers in Suscal Area where destitute situation prevails was verified by organizing 22 farmers in an association, by distributing hybrid seeds of potato, corn, barley and pea and by providing technical assistance on farming to farmers. Purposes, activities and inputs of this project are as given below.

Table: Summary of Pilot Project in Suscal Area

Purposes	<ul style="list-style-type: none"> • Forging measures to increase agricultural production among small and marginal farmers. • Increase in output of agricultural products by means of distributing hybrid seeds as well as provision of technical extension services to be easily accepted by farmers for dissemination among them. • Raising awareness of farmers on improvement of their farming practice.
Activities	<ul style="list-style-type: none"> • Creation of farmers' association. • Crop cultivation and field training on farming technologies at cooperative farm. • Production and storage of seeds at seed production farm. • Exhibition of various varieties of seeds at demonstration farm. • Distribution of profits • Return of seeds (130% of supplied amount) and return of farm inputs (equivalent to supplied amount). • Transfer of technologies acquired in the course of the project to neighboring farmers after completion of the project.
Inputs	<ul style="list-style-type: none"> • Farm inputs (Seeds: potato for 2.5 ha, corn for 1.5 ha, pea for 1.5 ha, and barley for 1.5 ha, etc,

	lime, fowl droppings, fertilizers, insecticide, herbicide, bags, etc.). <ul style="list-style-type: none"> • Lending farm inputs and project management. • Training materials for transfer of technologies to other farmers. • Technical assistance on crop production. • Supply of hybrid seeds.
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It was proved in the course of the present pilot project that a rise in unit yield (potato: 1.9 ton/ha to 10.0 ton/ha and corn: 0.6 ton/ha to 2.5 ton/ha) was attained even among farmers who were engaged in traditional and low-productive farming, owing to input of hybrid seeds and provision of appropriate technical assistance. This verified outcome suggests that a rise in unit yield should be attained subject to rendering small-scaled supports (supply of hybrid seeds, enlightening farmers the importance for inputting fertilizers and provision of technical assistance) to farmers who had been remained under destitute situation without being provided appropriate supports, and that the living standard of these farmers should be enhanced remarkably. In sum, the importance for use of hybrid seeds and fertilizers as well as for provision of technical assistance services to farmers was verified.

5.3 Oña Area (Raising Farm's Income)

The great bulk of farmers in this area is alienated from the market economy and is suffering from marginal conditions. The pilot project in question aimed to verify the impact for introduction of small animal (*cuy*) and tree tomato on the livelihood of the said farmers. Purposes, activities and inputs of this project are as follows:

Table: Summary of Pilot Project in Oña Area

Purposes	<ul style="list-style-type: none"> • Forging measures for introduction of sustainable farming activities. • Implementation of crop production in combination with raising of small animals. • Introduction of organic fertilizer • Transfer of technologies among farmers
Activities	<ul style="list-style-type: none"> • Creation of farmers' association.(3 groups composed of 10 members each) and structuring of a mechanism for raising a sense of duty. • Construction of a breeding farm for <i>cuy</i>, raising of <i>cuy</i>, return of raised <i>cuy</i> after 10 months, distribution of raised <i>cuy</i> to neighboring farmers and technical transfer. • Cultivation of tree tomato with use of organic fertilizers and supply of 10% of harvests to primary school. • Cultivation of grains with use of organic fertilizers and supply of 10% of harvests to other farmers. • Participation in seminar on extension of improved cropping technologies. • Development of project with use of returned <i>cuy</i>s
Inputs	<ul style="list-style-type: none"> • Distribution of hybrid <i>cuy</i>s (10 males and 2 females for each farmer). • Supply of compound fertilizes and chemicals required for breeding period of 1 month. • Installation of production facility for organic fertilizers. • Distribution of seeds for vegetables. • Distribution of seeds grains for feeding <i>cuy</i>. • Distribution of hybrid seedlings for tree tomato (300 units) • Provision of close technical assistance.

Owing to a close technical assistance and appropriate use farm inputs as well as spontaneous efforts of farmers, the project inaugurated with a participation of 30 farmers and was expanded in such a manner as to comprise a total of 100 farmers. At the same time, this project played a guiding role to enhance the living conditions among neighboring people by demonstrating them the impact of introduction of fruits and vegetables production in combination with raising of small animals to enhance the living conditions. Farmers in the neighborhood are highly interested in this project and are anxious to participate in it, after having demonstrated the impact of the project by its beneficiaries. This project may be taken up as an example of a sustainable development agricultural project. In sum, the project verified that "Considerable improvement of farming activity is anticipated even with the use of the least amount of farm input, provided that an appropriate institutional supporting service should be rendered".

5.4 Cachi Area (Improvement of Milk Productivity among Marginal Cattle Farmers)

Three demonstration farms were established within target area of this pilot project and the impact for improvement of milk production was verified with the introduction of different types of farming for each respective farm. A total of fifteen (15) farmers participated in this project and three (3) model dairy farmers and twelve (12) model surrounding farmers were trained. This attempt bore fruits in such manner as to raise average productivity of milk from 5.9 liters/day to 7.0 liters/day; this productivity was boosted to 10 liters/day among model farmers. Purposes, activities and inputs of these projects are as summarized below:

Table: Summary of Pilot Project in Cachi Area

Purposes	<ul style="list-style-type: none"> • Implementation of agricultural and livestock production with emphasis laid on conservation of river basins (Rotation of crops production and grazing, pastoral-forestry, etc.). • Increase in milk production among marginal farmers. • Improvement of pasture
Activities	<ul style="list-style-type: none"> • Measures for improvement of grazing lands. • Upgrading technologies for dairy cattle farming (Administration of grading lands, cattle raising method, sanitary control of cattle and countermeasures against soil erosion) and establishment of bank for production and storage of hybrid seeds for pasture. • Supply of milk for schools.
Inputs	<ul style="list-style-type: none"> • Distribution of hybrid seeds and fertilizer for 1 ha of pasture. • Materials for installation of fence equipped with electric wire. • Equipment and tools for administration of grazing lands. • Materials and equipment for sanitary control of cattle.

This project may be regarded as a model project for the encouragement of livestock production among farmers engaging in marginal farming in mountainous area facing with the problem of absentee head of household who left to seek an employment opportunity within the country or abroad. Because it was proved that this project contributed to improvement of livestock activity and lightening of farm labor among women with the least investment cost, some farmers in the neighborhood launched on agricultural and livestock production making reference to this project. Farmers' association was able to recruit new members and to expand grazing lands of improved pasture among their members by means of establishment of a bank for production and storage of seeds. At present, not a few farmers' associations around the project area expressed their interest in participating in this project, resulting in high synergy effect of the project.

5.5 Bulan Area (Support to Cash Crops and Encouragement of Agro-industry)

Targeting twenty two (22) farmers engaging in production of Andean fruits, this pilot project was put into implementation with the purpose of verifying the viability of these farmers to participate in agro-industry by means of upgrading technologies on cultivation of Andean fruits and constructing processing facility of Andean fruits under ownership of the beneficiaries. Purposes, activities and inputs for this project are as mentioned below.

Table: Summary of Pilot Project in Bulan Area

Purposes	<ul style="list-style-type: none"> • Promotion for development of regional agro-industry. • Stabilization of conventional markets and development of new markets for Andean fruits. • Raising value-added of agro-products. • Farm management in answer to marketing circumstances.
Activities	<ul style="list-style-type: none"> • Agreement on participation of farmers' association in the project. • Extension of technologies for fruits production. • Construction and operation of agro-products processing facility. • Improvement of facilities and machinery for agro-industry. • Holding seminar on technological aspect of agro-industry and participation in this seminar. • Participation in agro-industry extension course. • Establishment and operation of antenna-shop for processed products.
Inputs	<ul style="list-style-type: none"> • Manpower for design of agro-products processing facility. • Construction materials, equipment and machinery for processing and transportation cost for

	<p>market research.</p> <ul style="list-style-type: none"> • Personnel in charge of technical assistance on processing agro-products, management consulting, technical assistance on production of fruits and supports for farmers' association. • Transportation cost for market research.
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Although considerable effect was confirmed in support to cash crops, tangible benefit was hardly attained with regard to promotion for development of agro-industry; farmers acquired technical means for production of preserves and other processed products of fruits, but their interest in participation in the activities developed in the course of this project was less than other pilot projects, being faced with drawback relevant to marketing of processed products. Being difficult to alleviate constraint on marketing of agro-industry-related products as well as calling for larger amount of investment const, the development plan for agro-industry should be elaborated in more deepened manners. The following points were identified as reasons for failure in attainment of anticipated outcome of the project.

- Construction of facilities was made by the JICA's Study Team, which implanted the beneficiaries that the project was implemented in such conventional manner as being taken the initiative by public agencies.
- Without charging repayment on investment cost of facilities, beneficiaries were rather apathetic toward implementation of the project.
- Difficulty in marketing of processed products led to spoil beneficiaries' eagerness for the project.
- Participants in the project were a novice on agro-industry
- Participants had no interest in investment on facilities of agro-industry.

5.6 San Gerardo Area (Improvement of Marketing for Dairy Products)

Targeting fifteen (15) eligible dairy farmers in predominant areas of dairy production, the present pilot project was implemented aiming at development of forwarding and processing facilities under ownership of a cooperative and to raise value-added of agro-products by means of organizing farmers' associations and rationalization of marketing conditions.

Table: Summary of Pilot Project in San Gerardo Area

Purposes	<ul style="list-style-type: none"> • Raising income attributable to improvement of marketing conditions for milk and dairy products. • Promotion for regional specialties and upgrading quality of dairy products. • Encouragement of enterprises fro embarking on processing dairy products. • Intensification of livestock production matching the needs of markets.
Activities	<ul style="list-style-type: none"> • Establishment of working group. • Elaboration of rules for the association and agreement on group activities. • Land preparation for construction of collection and forwarding facilities of cooperative ownership. . • Cooperative activities for collection of raw milk and forwarding of processed milk including quality control of the milk. • Participation in technical seminar, expansion of facilities, recruiting new members and technical transfer to new members.
Inputs	<ul style="list-style-type: none"> • Personnel in charge of design for collection and forwarding facilities of milk. • Refrigeration plant.

Thanks to transfer of technologies on dairy cattle farming and development of cooperative collection and forwarding facilities equipped with refrigeration tank, rise in farm income was attained among dairy cattle farmers; transfer of technologies envisaged in this small-scaled project brought about considerable effect. And, with regard to development of cooperative collection and forwarding system farmers by themselves confirmed that it is more effective to organize farmers' association among small-scaled farmers and to distribute profits to be gained collectively among members.

5.7 Focal Issues in Formulation of the Master Plan

The following five goals are indispensable to approach poverty reduction, and a spontaneous and sustainable development of the Study Area.

Table: Five Goals and Considerable Issues

Goals	Issues to be considered
Group activities by participation of local people	In order to deepen the collaboration among local people, it is important to raise confidence of each person in respective activities and more effective way for attainment of this purpose shall be to raise social standing of these persons through contribution to social affairs. In this connection, the following measures shall be taken: <ul style="list-style-type: none"> • Identification of expectation of local people and development of human resources (through capacity building of CREA and INIAP). • Strengthening of organization of local people (through capacity building of CREA and INIAP).
Training of leaders through implementation of a project	The role of regional leaders is essential for satisfactory implementation of development projects and empowerment of regional leaders is an indispensable factor for regional development. Therefore, measures for empowerment of regional leader (through capacity building of CREA and INIAP) are anticipated to be taken for implementation of development projects.
Intensification of a relationship of mutual trust between public supporting agencies and beneficiaries	It is one of key factors to intensify the relationship of mutual trust between public supporting agencies and beneficiaries for efficient implementation of development projects. So as to foster trust of beneficiaries on services of public supporting agencies, empowerment of responsible persons endowed with technical qualifications is of importance for development of projects in the future.
Agricultural and livestock development with the least investment cost	For implementation of government investment projects it is necessary to promote them as projects in combination with the participation of the population through <i>Minga</i> -related activities and local institutions. From the farmers' standpoint, it is necessary to prevent the donation of the production supplies such as hybrid seeds that should be returned. For this to occur it is necessary to implement the following strategies: <ul style="list-style-type: none"> • Renovation of obsolete construction machinery and rental of renovated construction machinery for residents who requested it. • Procurement of materials for construction works according with construction plan and supply of them to farmers. • Implementation of construction works under joint venture of CREA, local government offices and beneficiaries. • Development of hybrid seeds and farming technologies (through capacity building of CREA and INIAP). • Intensification of technical transfer services (through capacity building of CREA and INIAP). • Structuring of a mechanism for rural finance system, which entails reimbursement of credit and envisages to raise awareness of beneficiaries for enhancement of living standard.
Spontaneous expansion of project by beneficiaries	For capacity building on sustainable development of project, it is prerequisite to edit technical manuals with care, which shall serve as basis for empowerment of beneficiaries. At the same time, it is expected that the beneficiaries should be enlightened so as to undertake technical transfer to farmers in the neighborhood. The following measures shall be taken. <ul style="list-style-type: none"> • Continuous provision of technical assistance by CREA with regard to operation and maintenance of facilities as well as water management. • Editing and distribution of technical manuals to serve as a basis for industrial activities of local people. • Provision of agricultural credit together with appropriate technical assistance and enlightening of users on importance for reimbursement of credit. • Empowerment of beneficiaries through technical assistance.

6. Master Plan for Poverty Reduction and Reactivation of Productive Activities in the Provinces of Azuay and Cañar

6.1 Overview of the Master Plan

Aiming at attaining upper targets of the Master Plan consists of “Poverty reduction and reactivation of productive activities in the provinces of Azuay and Cañar”, thirteen (13) projects were selected for the five (5) development components.

Table: Development Component and Projects

Development Component	Project	Explanation
1 Improvement of agriculture and livestock sector	1-1 Staple Food Production Improvement	Aiming to improve the productivities of small scale farmers who are dealing with low profitable agriculture and livestock farming.
	1-2 Income increase for farmer families	
	1-3 Micro-farming Milk Production Volume Increase	
	1-4 Support for products to be marketed	Aiming to improve the profitability of the medium scale farmers who owe production infrastructure.
	1-5 Improvement of dairy products commercialization routes	
2 Activation of non-agricultural sector	2-1 Promotion of Agro industrial Processing	Aiming to foster agro-industry related with Andean fruits and dairy products for empowering competitiveness of agricultural production of the region as a whole to expand the marketing and to create job opportunities there.
	2-2 Fostering of Dairy Products	
	2-3 Fostering of the rural zone handicraft.	
3 Upgrading of living standard	3-1 Habilitation of agricultural production infrastructure	Aiming to upgrade living and agricultural production environments of people in rural areas by means of development of social infrastructures.
4 Environmental conservation	4-1 Forestation Activities	To carry out reforestation projects by public agencies in collaboration with beneficiaries with regard to the areas of high plateau grass-land zone where people will be benefited directly by implementation of the project, while enhancing environmental education to raise awareness of local people for conservation of environment.
	4-2 Environmental Education	
5 Functional strengthening of public supporting organization	5-1 CREA reinforcement	Aiming to reinforce CREA and INIAP, which have been taking care of rural farmers, for the aspects of human resources and capability of the entities for strengthen the performance of extension works and productivities of farmers.
	5-2 INIAP reinforcement	

6.2 Project Implementation Procedure

In this section, an implementation procedure for the projects proposed is described as follows.

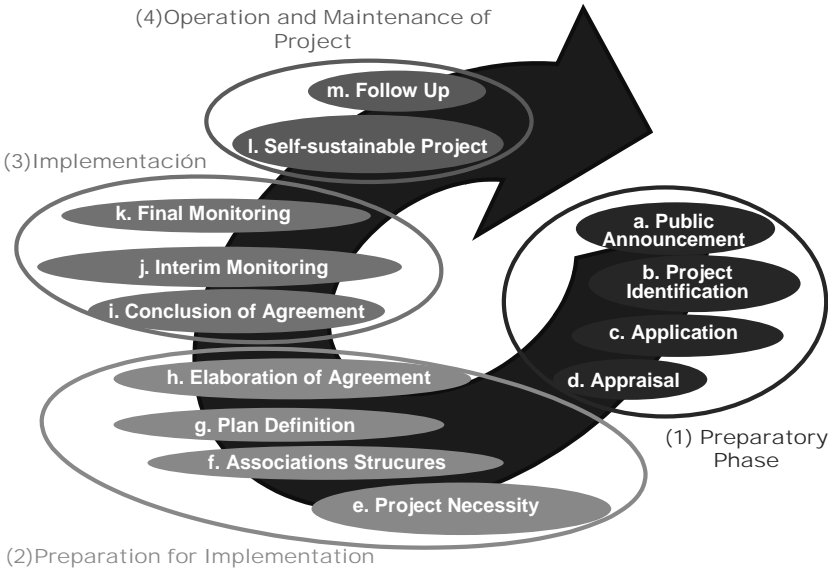


Table: Project Implementation Procedure

Stages of Project Implementation	Major Contents
(1) Preparatory Phase	Procedures and applications for the candidate zones selection and the definition of the agreement contents are very important actions at the preparation stage. To select the candidate zones, the supporting entity shall carry out divulgation activities among communities, the concerned entities and the farmers’ organizations. The supporting entity should select the Projects analyzing the applications of the organizations, communities, concerned entities and municipalities through its experience and knowledge.
(2) Preparation for Implementation	During preparation for implementation stage it is necessary to investigate the socio-economic situation of the candidate zone, elaborate a detailed operation plan and to start the preparation for the sign of the agreement.
(3) Implementation	Activities common to all projects, according to the detailed plan defined are the agreement between the supporting entity and the beneficiaries concerning project implementation and the introduction of monitoring by which the plan should be reviewed, corrected or complemented according to the project progress conditions.
(4) Operation and Maintenance	After completion of the projects, in an attempt of self-sustainable operation and maintenance of the said project by beneficiaries including organizations as well as expecting synergy effect over surrounding areas, the activities shall be carried out.

6.3 Implementation Plan of the Development Components

6.3.1 Improvement of Agricultural and Livestock Sector

This development component shall consist of five projects as listed in the following table. The project (1.1) aims to foster farming activity of the areas where farmer adhere to conventional farming practice by distributing hybrid seeds, rendering technical assistance and providing micro-credit services. The project (1.2) has a purpose to elevate farm income by means of introduction of cash crops, distribution of hybrid seeds, provision of micro-credit and rendering technical assistance, targeting farmers at remote rural areas where opportunities for attaining income have been deficient. The project (1.3) plans to upgrade livestock farming of small and marginal farers engaging dairy production, by means of improvement of pasture, rendering technical assistance on feeding system to cattle and provision of

micro-credit. And, the project (1.4) envisages reinforcing institutional supporting services in relation with strategic crops (Andean fruits and vegetables) comprising micro-credit service to be provided for promotion of cash crops. And, the project (1.5) aims to raise the farm income through marketing value-added dairy products. Detailed contents of respective project are as described hereinafter.

Table: Projects for Improvement of Agricultural and Livestock Sector

Project	Contents of Project
(1.1) Upgrading of subsistence-oriented agro-products	This project proposes to supply hybrid seeds and farm inputs to farmers depending on micro-credit system, aiming at improvement of agricultural production thanks to input of hybrid seeds. For this purpose, seed production and storage banks shall be established at each canton and farming system to make use of hybrid seeds shall be designed; in parallel, institutional supporting services shall be intensified for upgrading farmers' production capability. It is anticipated that, as a consequence of these efforts, increased agricultural output should be attained and subsistence ratio of staple crops among farmers should be elevated. In the concrete, the project shall comprise establishment of hybrid seeds production center and seeds storage banks, provision of micro-credit and intensification of institutional supporting services.
(1.2) Raising farmer's income	This project envisages raising of cuys, source of protein among people in Andean countries, and cultivation of Andean fruits by forming farmers' association; in the concrete, establishment of raising center of cuys shall be established and union of farmers' association shall be organized. On the other hand, by organizing association among farmers, raising and marketing of cuys shall be improved. The necessary fund for implementation of the project at its initial stage shall be procured through micro-credit services, but it is advisable that this project should be developed with own fund of beneficiaries at the latter stage when the project shall have been operated in a satisfactory way reached and.
(1.3) Improvement of milk productivity among marginal cattle farmers	This project seeks for an increase in output of milk production together with alleviating burden of women in farm labor, by means of such measures as introduction of improved pasture, improvement in dairy cattle raising method and installation of fence equipped with electric wire in the area where marginal dairy farming prevails. The project shall comprise such components as capacity building of farmers' association, intensification of technical extension services, and improvement of milk production method and provision of micro-credit.
(1.4) Support to cash crop production	This project has a purpose to produce high-quality goods by means of intensification of technical extension services to be rendered on cultivation of Andean fruits, which are regarded to be highly competitive among regional products. For this purpose, institutional supporting services of the public service shall be intensified together with provision of micro-credit.
(1.5) Improvement for marketing of dairy products	This project aims to upgrade the quality of milk in the region and to elevate income of farmers by means of improvement in marketing system of dairy products in an attempt for raising competitiveness of dairy products in the region. In this connection, the project comprises support for organizing association of livestock farmers for fostering of marketing of dairy products and provision of micro-credit for improvement of marketing conditions such as introduction of refrigerating tank, etc.

6.3.2 Activation of Non-agricultural Sector

An activation of non-agricultural sector consists of creation and development of agro-industry for processing Andean fruits, vegetables, dairy products, etc. and of handicraft manufacturing. Processing of Andean fruits and vegetables, which are considered as highly potential products of the region for marketing outside the region, is expected to expand marketing destination of these crops and, at the same time, to strengthen competitiveness of the said potential products of the region by raising their value-added. Processing of dairy products, on the other hand, has objectives to raise value-added of milk, leading product of the region, not by marketing of milk as raw material but by processing it to produce cheese, etc., as well as to expand market of dairy products.

Table: Activation of Non-agricultural Sector

Project	Contents of Project
(2.1) Encouragement of agro-products processing industry	This project proposes to increase competitiveness of strategic agro-products at markets by means of promotion for processing industry of regional strategic agro-products. Priority in rendering supports shall be given to processing of Andean fruits and existing industries for processing regional specialties. For this purpose, the project shall comprise supports to entrepreneurs' activities, financial assistance and advisory and consulting services in operation of enterprises.
(2.2) Encouragement of dairy products processing industry	This project envisages supports to dairy products processing industry existing within the region, with purposes of elevating value-added of raw milk produced in the region and expansion of markets for processed milk. The scope of these supports is composed of analysis on market competitiveness, measures for upgrading of quality and participation proposal in new markets, together with financial assistance as required.
(2.3) Encouragement of rural handicrafts manufacturing industry	This project seeks for an increased competitiveness of local industry existing in the region, by means of provision of necessary institutional supporting services. The project shall comprise such components as intensification of training of people at CREA's facility, improvement of marketing system and financial assistance for installation of necessary facility for upgrading quality of goods.

6.3.3 Upgrading of Living Standard

As for development of social and economic infrastructure, more effective development method is required and participation of rural organizations in development process (*Minga*) should be fostered. At present, regarding with development of social infrastructure (simple waterworks, community centers, rural roads, etc.) participation of beneficiaries is realized, not on initiative of beneficiaries but in response to suggestion of public agencies. Under the circumstances, it is of importance to take a step to foster willingness and awareness of the beneficiaries for their playing focal role in development of infrastructure.

Table: Projects for Upgrading of Living Standard

Project	Contents of Project
(3.1) Social and economic infrastructure development	This project aims to develop productive infrastructure by beneficiaries in areas where farmers are anxious for this development with agricultural development plans to have been formulated already, by means of rental of lending construction machinery and supply of construction materials for irrigation system development and provision of engineering services. For this purpose, logistics section and construction machinery section shall be strengthened. Meanwhile, with regard to development of social infrastructure, construction materials shall be supplied to the areas where local people are anxious for this development, so as to hasten construction of schools, medical centers and rural roads.

6.3.4 Environmental Conservation

The greater part of destitute people in the provinces of Azuay and Cañar are represented by small and marginal farmers and poverty reduction would not be attained without adequate conservation of natural resources, source of productive activities of these farmers. In this connection, public agencies as well as local people are required to take a step for conservation of "Bio-ecosystem", "Soils" and "Water Resources".

As a measure in the concrete, it is proposed to maintain productive capability of soils by means of cultivation of water resources and conservation, renovation and management of forests functioning countermeasure against soil erosion. On the other, due to the fact that administration and maintenance of forests by inhabitants of target area is indispensable, reforestation project shall comprise environmental education for local people with an aim to raise their awareness on environmental conservation and participation in environment-related activities.

Table: Projects for Environmental Conservation

Project	Contents of Project
(4.1) Promotion for reforestation	In view of conservation of regional natural resources in areas where natural resources are vulnerable to being deteriorated and local people are highly anticipated for this attempt, this project proposes to implement reforestation under joint venture of beneficiaries and public supporting agencies. For this purpose, public supporting agencies shall provide beneficiaries seedlings for reforestation free of charge.
(4.2) Strengthening of environmental education	Aiming at elevating awareness of local people on environmental conservation, this project envisages environmental education to be developed at schools and regional community centers.

6.3.5 Functional Strengthening of Public Supporting Organization

In order that public supporting organizations should realize and attain the goals of respective project proposed in the Master Plan, it is not enough to put exclusively financial resources but is of importance to render institutional supporting services comprising technology transfer and extension services targeting proposed beneficiaries in a satisfactory manner. In this connection, it is prerequisite to upgrade technological standard of the public supporting agencies in charge of the said services as well as to strengthen the contents of the services. On the other hand, upgrading and effective utilization of equipment and facilities required for supporting services to farmers as well as intensification of research and investigation aiming at enhancement of technological standard of the services is essential.

Table: Projects for Functional Strengthening of Public Supporting Organization

Project	Contents of Project
(5.1) Capacity building of CREA	In view of strengthening institutional supporting services to farmers/farmers' association and entrepreneurs, capacity building of CREA shall be put into implementation. For this purpose, the project shall comprise modernization of existing facilities, effective use of farms and empowerment of personnel.
(5.2) Capacity building of INIAP	Aiming at development of farming activity in accordance with physical characteristics of the region, capacity building of INIAP shall be realized to enable structuring of basic conditions for provision of technical extension services to farmers.

6.4 Improvement of Financing System

6.4.1 Provision of Micro-Credit

It is proposed that farmers' associations should establish a joint agency for administration of project fund or entrust administration of project fund to existing financing agency. After deciding the agency for administration of project fund, farmers' associations shall launch on preparation of project implementation plan and disbursement plan of fund needed for application of fund, under guidance of public supporting agencies. Subject to review and approval on application form by public supporting agencies and the agency for administration of project fund, the agency for administration of project fund shall proceed with application for transfer of fund to financing agencies. The said agency for administration of project fund in collaboration with public supporting agencies shall render technical assistance on preparation of project implementation plan, disbursement plan of fund and operation of fund shall establish supporting system for this task. The association shall bear mutual responsibility for provision of micro-credit to its affiliated members and reimbursement of fund from members. Proposed amount of micro-credit per beneficiary shall not be larger than US\$ 1,000, but shall be decided taking the reimbursement ability of each beneficiary into account. The following chart illustrates the flow of fund for micro-credit.

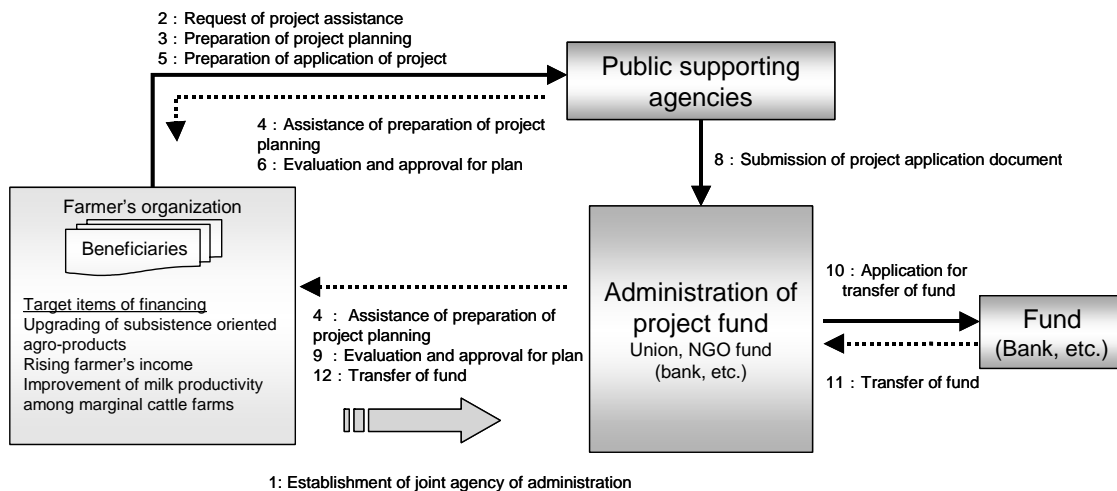


Figure: Flow for Micro-Credit

6.4.2 Finance to Entrepreneurs

Eligible beneficiaries of this attempt shall be small-scaled enterprises operated by farmers' associations. As the case of the provision of the micro-credit, an agency for administration of project fund shall be established under guidance of public supporting agencies and this agency shall be responsible for examination on whether an applicant for finance has enough mortgage or not and whether an applicant for finance has a prepared disbursement plan or not. After approval on project implementation plan and disbursement plan of fund, the agency shall proceed with application for finance to financing agencies and then undertake provision of fund to applicants. Public supporting agencies shall provide supporting services with input of personnel to be benefited by relevant capacity building project. The ceiling amount of finance in this attempt shall be US\$ 100 thousand per applicant.

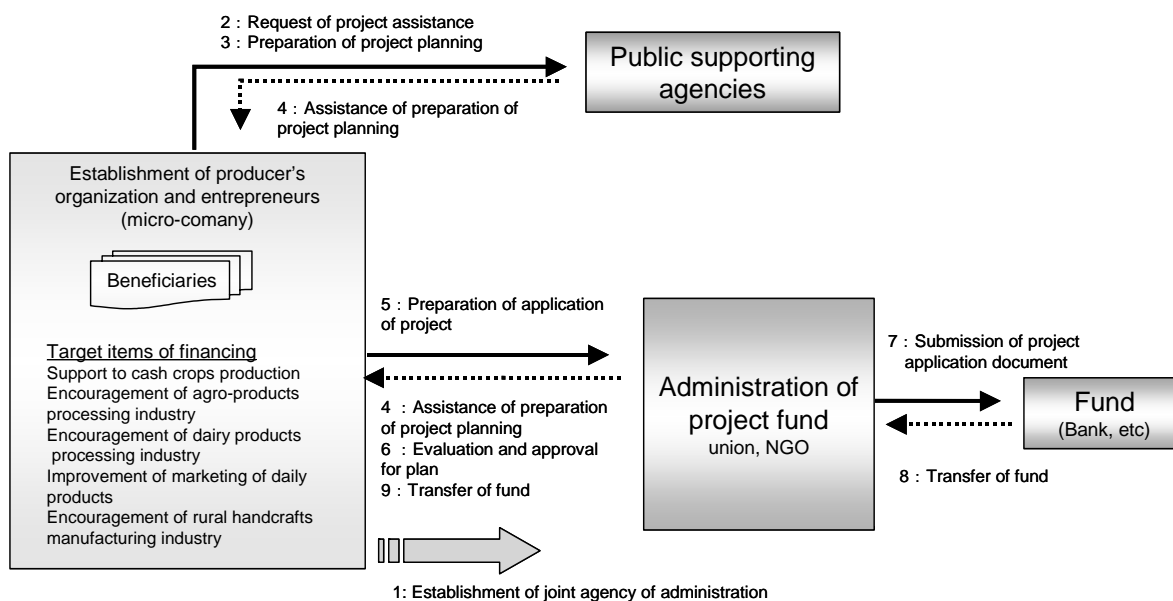


Figure: Flow for Entrepreneurs

7. Implementation Plan of the Master Plan

7.1 Projects Structures and Implementation Schedule

7.1.1 Structures of Projects

Implementation plan of the Master Plan will consist of concrete schedule and project budgetary plan basing on the structures of the projects, which is to be summarized in the following table.

Table: Structures of Projects

Development Components	Project	Project Structure		
		Activities		Finance Source
1. Improvement of agriculture and livestock sector.	1.1 Upgrading of subsistence-oriented agro-products.	<ul style="list-style-type: none"> • Selection of improved seeds and supply of seed for production. • Establishment of a seed bank. 	<ul style="list-style-type: none"> • Production activities using improved seeds. • Strengthening of diffusion activities. 	• Micro credit
	1.2 Raising farmer's income.	<ul style="list-style-type: none"> • Cuy breeding center for distribution to be propagated. • Establishment of a producers association. • Production activities using the distributed material. 	<ul style="list-style-type: none"> • Balanced food production and collective facilities for processing and selling. • Strengthening of diffusion activities. 	• Micro credit.
	1.3 Improvement of milk productivity among marginal cattle farmers.	<ul style="list-style-type: none"> • Establishment of a producers association. • Strengthening of diffusion activities. 	• Improvements in milk production.	• Micro credit.
	1.4 Support to cash crops production.	• Production improvement of products to be marketed.	• Strengthening of diffusion activities.	• Micro credit. • Credit for entrepreneurs
	1.5 Improvement for marketing of dairy	• Establishment of a cooperative.	• Habilitation of commercialization routes.	• Credit for entrepreneurs
2. Activation of non-agricultural sector.	2.1 Encouragement of agro-products processing industry.	<ul style="list-style-type: none"> • Support to entrepreneurial activities. • Entrepreneurs financing. 	<ul style="list-style-type: none"> • Support for projects management. • Sales strengthening. 	• Credit for entrepreneurs
	2.2 Encouragement of dairy products processing industry	<ul style="list-style-type: none"> • Establishment of a cooperative. • Support to entrepreneurial activities. 	<ul style="list-style-type: none"> • Quality Improvement. • Sales strengthening. 	• Credit for entrepreneurs
	2.3 Encouragement of rural handicrafts manufacturing industry.	<ul style="list-style-type: none"> • Micro-producers • Support to handicraft industries. 	• Strengthening of diffusion activities.	• Micro credit.
3. Upgrading of living standard.	3.1 Social and economical infrastructure development.	<ul style="list-style-type: none"> • Project identification and plan elaboration. • Maintenance of construction equipment. • Utilization of construction equipment. • Acquisition of materials. 	<ul style="list-style-type: none"> • Promotion of Minga participation. • Provision of infrastructure. • Maintenance of construction equipment. 	• Investment as public services.
4. Environmental Conservation.	4.1 Promotion of reforestation.	<ul style="list-style-type: none"> • Habilitation of the seedling production center. • Plan of seedling 	<ul style="list-style-type: none"> • Protected areas reforestation plan. • Productive areas reforestation. 	• Investment as public services.
	4.2 Strengthening of environmental education.	• Environmental education for farmers.	• Environmental education for young generation.	• Investment as public services.
5. Functional strengthening of public supporting organization	5.1 Functional strengthening of CREA.	<ul style="list-style-type: none"> • Installation modernization. • Farms effective use. 	• Human resources capacity building.	• Investment as public services.
	5.2 Functional strengthening of INIAP	• Improvement of facilities.	• Strengthening R&D capability.	• Investment as public services.

7.1.2 Project Implementation Schedule

Projects of each component are to be implemented to attain the objectives of the Master Plan. For defining the project implementation schedule, due to the non-availability of the record of previous budgetary arrangements of the allocated budget from the national government to CREA and assistance from foreign donors, the implementation of the project was decided for 15 years taking into account the term when improvement measures envisaged in the Master Plan shall maintain validity over benefited regions, as well as, presuming an average yearly investment cost to be lower than twice as much as the yearly budget of CREA, US\$ 7.0 million. Figure of the implementation schedule is shown in the next page.

Table: Schedule Implementation Schedule

Program	Sub Program Content	Año														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Improvement of agriculture and livestock sector	1.1Upgrading of subsistence-oriented agro-products															
	Selection of improved seeds, distribution for production		■	■												
	Seed bank implementation		■	■	■											
	Production applying supplied input	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Strengthening of diffusion activities	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.2Raising farmer's income															
	Cuy for reproduction breeding center to be distributed		■	■	■											
	Establishment of producers association		■	■												
	Production activity utilizing distributed materials	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Production applying supplied input	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Organic fertilizer production, collective processing and sales	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Strengthening of diffusion activities	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.3Improvement of milk productivity among marginal cattle farmers															
	Establishment of producers association		■	■	■											
	Improvement of milk production	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Strengthening of diffusion activities	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1.4Support to cash crops production															
	Crop improvement															
	Strengthening of diffusion activities															
	1.5Improvement of dairy products commercialization															
Establishment of producers cooperative																
Habilitation of commercialization routes																
Strengthening of diffusion activities																
2.Activation of Non-agricultural Sector	2.1Encouragement of agro-products processing industry															
	Financing to entrepreneurs															
	Support to Project management															
	2.2Encouragement of dairy products processing industry															
	Establishment of producers cooperative															
	Support to entrepreneurs activities															
	Improvement of product quality															
	Sales reinforcement															
	2.3Encouragement of rural handicrafts manufacturing industry															
	Micro-producers association															
	Support to the regional economy															
	Handicraft reactivation															
Strengthening of diffusion activities																
3.Upgrading living standard	3.1Social and economic infrastructure development															
	Project identification and plan elaboration	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
	Habilitation of construction machinery		■	■	■	■	■	■	■	■	■	■	■	■	■	
	Actividad de utilizacion de los Equipamientos		■	■	■	■	■	■	■	■	■	■	■	■	■	
	Material Supply		■	■	■	■	■	■	■	■	■	■	■	■	■	
	Incentive to participate in the Minga		■	■	■	■	■	■	■	■	■	■	■	■	■	
	Construction using supplied material and machinery	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Construction equipment operation and maintenance	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
4.Environmental Conservation	4.1Promotion of reforestation															
	Habilitation of seedling breeding ground		■	■	■	■	■	■	■	■	■	■	■	■	■	
	Seedling distribution plan		■	■	■	■	■	■	■	■	■	■	■	■	■	
	Protected areas reforestation plan		■	■	■	■	■	■	■	■	■	■	■	■	■	
	Productive areas reforestation plan		■	■	■	■	■	■	■	■	■	■	■	■	■	
	4.2Strengthening of environmental education															
Environmental education towards farmers																
Environmental education towards young population																
5.Functional strengthening of public supporting organization	5.1Functional strengthening of CREA															
	Installations modernization plan		■	■	■	■	■	■	■	■	■	■	■	■	■	
	Plan for the effective utilization of farms		■	■	■	■	■	■	■	■	■	■	■	■	■	
	Personnel training		■	■	■	■	■	■	■	■	■	■	■	■	■	
	5.2Functional strengthening of INIAP															
	Installations modernization plan		■	■	■	■	■	■	■	■	■	■	■	■	■	
Plan of investigation strengthening		■	■	■	■	■	■	■	■	■	■	■	■	■		

■ Using fund of 2KR ■ Using fund of BI ■ Using other fund

7.1.3 Initiatives for the Project Actions

a. Beneficiaries' Burden

Beneficiaries shall be in charge of: (1) Devolution of micro-credits granted for the farmers, (2) loans made to entrepreneurs, (3) farmers' capital to invest, (4) Supply of work for the habilitation of basic and production infrastructure labor force by the *Minga*, and (5) Social solidarity.

b. Governmental Entity Burden

Governmental entity shall be in charge of the investments in: (6) Construction machinery acquisition, (7) Material acquisition, (8) Facility construction, (9) Technical assistance conducted by CREA and INIAP and (10) Support to the activities of the regional government, municipalities, CREA and INIAP.

Table: Components of Actions for Each Project

Development Component	Project	Shared By Beneficiary					Shared By Public Entities				
		Financing		(3) Farmers' capital to invest	Labor Delivery		Investment by governmental entities			Support for Activities	
		(1) Micro credit	(2) Financing to entrepreneur		(4) Minga Activities	(5) Social Solidarity	(6) machinery construction	(7) Supply of material supply	(8) Facility construction	(9) Technical assistance	(10) Activities support
1. Farming Development.	1.1 Staple Food Production	○		○		○				○	○
	1.2 Income increase for farmer families.	○		○		○		○		○	○
	1.3 Micro-farming Milk Production Increase.	○		○		○				○	○
	1.4 Support for products to market.	○		○		○				○	○
	1.5 Improving of dairy products commercialization routes.		○	○		○					○
2. Reactivation of the Non-farming Sector.	2.1 Promotion of Agro industrial Processing.		○							○	○
	2.2 Promotion of Dairy Products.		○								○
	2.3 Promotion of the rural zone handcraft.	○		○		○				○	○
3. Habilitation of Basic and Production	3.1 Habilitation of agricultural production infrastructure.				○		○	○		○	○
4. Environmental Conservation.	4.1 Forestation Activities.				○	○		○	○		
	4.2 Environmental Education.										○
5. Reinforcement of Supporting	5.1 CREA reinforcement.							○	○	○	
	5.2 INIAP reinforcement.							○	○	○	

7.1.4 Financial Source for Project Implementation

The necessary budget for the project implementation shall be allocated from the superordinate agencies. Micro-credit for small scale farmers shall be prepared by the Government banks like the Ecuadorian Central Bank and others from the Ministry of Finance to finance to the organizations in charge of micro-credit to be established through the project. Financial assistance for entrepreneur has to be handled by the private banks in cities and financing organizations managed by NGO.

7.2 Project Cost

7.2.1 Project Cost by Structure of Projects

Projects nominated in the Master Plan are from considerations to become sufficient enough for handling within the present budgetary scale of the related agencies and financial burden of the participants to meet with their affordability. Hence it can be said that the repayment by the farmers will be within the limits that they can afford without much sacrifice. The projects will be developed according to the financed amount.

Table: Implementation Cost by Project Component

Project		Cost (US \$ X 1,000)	Structure of actions							
			Burden for the beneficiary			Burden for the governmental entity				
			Financing		Minga Activities	Government Investment			General Budget	
			Micro credit	Loan to entrepreneurs		Construction machinery supply	Construction material supply	Installation construction	Technical Assistance	Support to activities
Farming Development	Staple Food Production Improvement	1,863	63			100	100	300	1,000	300
	Income increase for farmer families	1,730	30			100	300	100	1,000	200
	Micro-farming Milk Production Volume Increase	1,620	520						1,100	
	Support for products to be marketed	600	100						500	
	Improvement of dairy products commercialization routes	500							500	
	Sub-total	6,313	713	0		200	400	400	4,200	500
Reactivation of the Non-farming Sector	Promotion of Agro industrial Processing	500								500
	Promotion of Dairy Products	800							300	500
	Promotion of the rural zone handcraft	680	80							600
	Sub-total	1,980	80	0					300	1,600
Habilitation of Basic and Production Infrastructure	Habilitation of agricultural production infrastructure	7,900				5,000	2,500			400
	Sub-total	7,900		0		5,000	2,500			400
Environmental Conservation	Forestation Activities	200				100	100			
	Environmental Education	200							200	
	Sub-total	400				100	100		200	
Reinforcement of Supporting Entities	CREA reinforcement	2,800	793				900	1,400	500	
	INIAP reinforcement	1,300					1,000	300		
	Sub-total	4,100		0			1,900	1,700	500	
Total		20,693	6,400	0		5,300	4,900	2,100	5,100	2,500

Note. "Implementation cost" in the above includes Government's burden and the initial cost for micro-credits.

The following table summarizes the implementation cost by project component. When financing the classified projects by structure, priority could be placed on the implementation of some projects of the Master Plan.

Table: Actions Contents by Project Component and Amounts

Project Component	Action Contents	Amount (US\$)
Micro-credit	Initial investment cost is added to the implementation cost. Total financing for small-scale farmers and their organizations (US\$9,890,000).	793,000* ¹
Financing to entrepreneurs	Not added to as cost here, because applying ordinary financing. Total cost; US\$ 1,500,000 for assistance for entrepreneurs.	0* ²
<i>Minga</i> activities	Construction works of basic and productive infrastructure, reforestation actions.	0
Construction equipment supply	Procuring construction equipment	5,300,000
Construction material supply	Material for irrigation installation (around 2,500 ha)	2,000,000
	Material for local roads	400,000
	Material for rural water works	400,000
	Material for schools, health centers	200,000
	Material for CREA reinforcement (implements for tests)	900,000
	Material for INIAP reinforcement (implements for tests)	1,000,000
Installation construction	Installations construction for CREA reinforcement	1,400,000
	Installations construction for INIAP reinforcement	700,000
Technical assistance	Support for the elaboration of plans, technical assistance	5,100,000
Activities support	Assistance for project management, support for reforestation actions.	2,500,000
Total		20,693,000

7.2.2 Financial Plan by Fiscal Year

Whole annual disbursement schedule is shown in the following table.

7.2.3 Farmer's Burden per Household

Most of the farmers in the Study Area are dealing with small-scale agriculture and livestock farming under the poor geographic and socio-economic conditions. The present Master Plan aims to support them to improve their productivities and income. But it is clarified that the introduction of projects with large-scale investment is difficult to implement.

Hence the total burden per one household is defined less than US\$300 per year for the projects of "Staple Food Production Improvement", "Income increase for farmer families" and "Habilitation of Basic and Production Infrastructure", which are scheduled to be commenced in the initial stage of the present Master Plan.

7.2.4 Source of Finance

Basically the Master Plan should be implemented with funds allocated from the national budget from the Government to CREA, INIAP and local governments. Besides that, it is necessary to actively seek foreign financing.

Table: Financing Sources by Project Component

Project Component	Budget (x US \$ 1,000)	Internal Budget			External Budget								
					Bilateral Cooperation					Multilateral cooperation			
		CREA	INIAP	Local Government	Donations			Disbursable Cooperation					
					Technical Cooperation	Donations	Donation by Foundations	Agreement between countries	Funds by countries	BID	CAF	BM	
Micro credit	793								⊙	○	○	○	○
Financing to entrepreneurs	0	○							○	○	○	○	○
Minga Activities	0												
Acquisition of construction machinery	5,300	○					○	○	○	○	○	○	○
Construction material acquisition	4,900	⊙		⊙					○				
Installation Construction	2,100	⊙	⊙						○	○	○	○	○
Technical assistance	5,100	⊙	⊙	○	○								
Support to activities	2,500	⊙		○	○								
Total	20,683												

⊙ : Under procedure

○ : With possibilities

7.3 Projects Implementation Organization

In implementation of the projects, CREA shall play the central role with collaboration given by INIAP, Provincial Governments, Municipal Governments, universities, NGOs, etc. The Master Plan consists of the projects to have been formulated in accordance with geographical conditions of living standard of farmers and implementation organizationd for these projects is thereby variable by project. Nevertheless, generally speaking, CREA and INIAP shall take charge of operation of projects, procurement of materials and equipment and technical assistance, meanwhile, minicipal governments in collaboration with CREA, INIAP and provincial governments shall be responsible for supports to such activities as project finding, reception and approval of various applications, etc.

Table: Task Allocation for Project Implementation

Development Component		CREA	INIAP	Gob.local	Munic.	Univers	Financial Entity	NGO
Project								
Project Structure								
1. Farming Development	1.1 Improvement of Staple Food Production							
	Selection of improved seeds, distribution for production		○					
	Seed bank implementation	○	○		○			
	Production applying supplied input	○	○		○		○	
	Strengthening of diffusion activities		○		○	○		○
	1.2 Increase in farmer families income							
	Cuy for reproduction breeding center to be distributed		○					
	Establishment of producers association		○		○			
	Production applying supplied input	○	○		○		○	
	Organic fertilizer production, collective processing and sales	○			○			
	Strengthening of diffusion activities		○		○	○		
	1.3 Milk Production increase by micro-producers							
	Establishment of producers association	○			○			
	Improvement of milk production	○			○			
	Strengthening of diffusion activities	○			○			
	1.4 Support for products to be marketed							
	Crop improvement		○					
	Strengthening of diffusion activities		○					
1.5 Improvement of dairy products commercialization								
Establishment of producers cooperative	○			○				
Habilitation of commercialization routes	○			○			○	
Strengthening of diffusion activities	○			○				
2. Reactivation of the Non-Farming Sector	2.1 Fostering of agro industrial Processing	○						
	Support to entrepreneurs activities	○						
	Support to Project management	○				○		○
	2.2 Promotion of Dairy Products							
	Establishment of producers cooperative	○						
	Support to entrepreneurs activities	○						
	Improvement of product quality	○				○		
	Sales strengthening	○						
	2.3 Promotion of handicraft at rural zones							
	Micro-producers association	○						
	Support to the regional economy	○						○
	Handicraft reactivation	○						○
Strengthening of diffusion activities	○						○	
3. Habilitation of basic & irrigation infrastructure	3.1 Basic and agricultural production infrastructure							
	Project identification and plan elaboration	○						
	Habilitation of construction machinery	○		○				
	Acquisition of materials	○		○				
	Material Supply	○			○			
	Incentive to participate in the Minga	○				○		○
	Construction using supplied material and machinery	○		○	○			
Construction equipment operation and maintenance	○							
4. Environmental Conservation	4.1 Reforestation activities							
	Habilitation of seedling breeding ground	○		○				
	Seedling distribution plan	○		○				
	Protected areas reforestation plan	○		○				
	Productive areas reforestation plan	○						
	4.2 Environmental Education							
	Environmental education towards farmers	○				○		○
Environmental education towards young population	○				○		○	
5. Strengthening of supporting entities	5.1 CREA strengthening							
	Installations modernization plan	○						
	Plan for the effective utilization of farms	○						
	Personnel training	○						
	5.2 INIAP strengthening							
	Installations modernization plan		○					
Plan of investigation strengthening		○						

8. Project Evaluation and Socio-environmental Considerations

8.1 Project Evaluation

8.1.1 Project Evaluation Method

The evaluation method shall follow qualitative analysis method of DAC that is based on five items, namely, "Relevance", "Effectiveness", "Efficiency", "Impact" and "Sustainability". Besides, in an attempt of making an appraisal on viability for implementation of project at farmer's level, a quantitative analysis (tangible impact analysis) of project shall be conducted by means of farm balance analysis.

8.1.2 Qualitative Analysis

(1) Project Relevance

The relevance of project has been examined in accordance with a) Eligibility of project (Target, scale and measures), b) Compliance project goals with the needs of beneficiaries and c) Coordination between development policies of Ecuador and donors. Each project has been evaluated to be highly relevant as explained below:

Project Relevance
<ul style="list-style-type: none"> • Target beneficiaries are farmers who live in mountain areas suffered from underdevelopment of road network. • To be complied with the needs and managerial capacity of beneficiaries. • Implementation of projects set upper target of poverty reduction can contribute for the serious condition in the rural area. • Development with use of locally available resources is proposed. • Development with use of locally available financial resources (Remittance by migrant workers) is proposed aiming at encouragement of regional development. • Agricultural and livestock improvement plan depends on the least investment cost. • To be accorded with poverty reduction policy, a national development goal in Ecuador. • Poverty reduction plan aims to contribute to attainment of purposes envisaged in millennium plan of the United Nations. • Revitalization in activities of farmers/farmers' organizations serves to bear positive impact. • Functional strengthening of public supporting organization contributes to bring about expected benefits.

(2) Project Effectiveness

Regarding with effectiveness of project, the following parameters have employed to verify proposed benefits to be expected by target beneficiaries owing to implementation of project.

Project Effectiveness
<ul style="list-style-type: none"> • Activities of farmers/farmers' organizations shall be revitalized owing to implementation of projects. • Supporting services of public organizations on extension and technical assistance shall be strengthened. • Anticipated contribution consists of deepening of collaboration and raising awareness on regional mutual support among farmers.

(3) Project Efficiency

The efficiency for implementation of projects has been evaluated on the degree of synergy effect of their inputs, and the impact of technical assistance services of public organization constitutes a parameter for evaluating project efficiency.

Project Efficiency

- With input of labor force in joint effort through *Minga*-related activities, etc., projects shall be implemented efficiently.
 - Projects shall be implemented with investment cost relatively depressed.
 - Group procurement method of materials to be input shall alleviate financial burden of individual farmer, which shall facilitate efficient participation of farmers in projects.
 - Measures to improve and strengthen agricultural and livestock activities are formulated as projects, so implementation of project shall be made in efficient manner.
-

(4) Project Impact

The project impact shall be examined on long-term and indirect benefits including synergy effects and for this purpose the following viewpoints shall be taken into account as follows.

Project Impact

- In compliance with the government's austerity policy under progress of decentralization program, the proposed project with depressed investment cost shall constitute regional development model.
 - As a consequence of satisfactory outcome of projects, remittance to be made by migrant workers shall be utilized as projects' fund.
 - With provision of technical assistance services by the public sector to farmers who have not been accessible to such services, the relationship between projects' beneficiaries and public supporting organization in charge of technical assistance shall be deepened.
 - Owing to revitalization of economic activities in rural area, remittance to be made by migrant workers shall be invested on development of agricultural and livestock activities, which, in turn, shall structure bases for remobilization of migrant workers to their hometown.
 - Project implementation methodology with input of organizations' activities shall be disseminated to neighboring areas due to realization of projects comprising component for structuring and strengthening of organizations.
 - With provision of technical assistance services by the public sector to farmers in mountain zone, far from urban area, who have not been accessible to such services, an eagerness of farmers on upgrading their technological level shall be fostered.
 - With deepening of the relationship between beneficiaries and public supporting organizations, projects shall be developed.
 - Experience and know-how to be accumulated in the course of implementation of projects, which shall serve functional strengthening of public supporting organizations.
 - Prevailing agricultural and livestock activities (both in technical and social aspects) of proposed beneficiaries shall be improved.
 - With employment of participatory approach in implementation of projects, ownership of beneficiaries on projects shall be created.
-

(5) Project Sustainability

The project sustainability deals with the durability of positive project benefits after termination of the technical cooperation channeled through respective project.

Project Sustainability

- The projects comprise technical assistance services of the public sector and extension of technologies among beneficiaries, so durable implementation of projects is possible.
- The projects of the Master Plan have been formulated in line with the prevailing activities of public supporting organizations, so continuous support of the public sector is expected.
- Through the experience of past projects, personnel of public supporting organization are posted, by putting the right persons in the right positions, which enables continuous implementation of projects
- Legal and institutional systems on registering of organization with relevant public agencies are prepared. And, sustainable implementation of the projects is viable, provided that the beneficiaries should form legally approved organization required for financing.
- Through the training for capacity building and empowerment of leaders to be conducted in the course of project implementation, decision-making of beneficiaries shall be hastened.
- Depopulation due to exodus of male adults seeking for employment opportunity outside the region is a serious

problem in the target region. Sustainable projects targeting aged people, women and youth shall be implemented in this Master Plan.

- In view of encouraging farmers to be acquired with ownership in the course of project implementation, participatory approach of beneficiaries is employed in the projects. Therefore, sustainable implementation of the projects with initiative taken by farmers is viable.
- Because the activities of farmers/farmers' organizations shall be carried out satisfactory and technical and financial supporting services of the public sector shall be rendered adequately, sustainable implementation of the projects may be possible.
- With participation of group training course in learning agricultural technologies, an awareness on interdependency shall be raised among local people, which shall contribute to sustainable implementation of the projects.

8.2 Assessment on Project Outcomes

In this section, in view of encouraging farmers to be benefited to participate in the projects of the Master Plan, tangible efficiency of the projects shall be assessed by means of farm economy analysis (Viability on raising farmer's income). Through implementation of the pilot projects, it was verified that financial and technical inputs for the projects included in the component: "Improvement of agricultural and livestock sector", having higher priority among the projects of the Master Plan and to be implemented within single year, should bring about satisfactory outcome. Referring to the results of the said pilot projects, the outcomes of the projects in this component is to be reported for the case of "farm economy analysis with project" hereinafter.

(1) Profit and Loss of the farmers' household with the implementation of the project

a. Projects with provision of micro-credit

The projects relying on provision of micro-credit are composed of those with low investment in view of rational use of existing resources and matching prevailing technological level and farming scale of proposed beneficiaries. As given in the table below, loan amount relevant to micro-credit shall be paid off in first year of each project and beneficiaries are entitled to gain net profit from subsequent year.

Table: Profit and Loss of the First Year of Project (Unit: US\$/farmer/year)

Projects	Profit without project	Profit with project	Incremental benefit <i>Obs). 1</i>	Repayment of loan <i>Obs). 2</i>	Balance
1.1 Upgrading of subsistence-oriented agro-products	521	1,869	1,348	271	1,077
1.2 Raising farmer's income	1,711	4,138	2,427	306	2,121
1.3 Improvement of milk productivity among marginal cattle farmers	2,658	3,176	518	200	318
1.4 Support to cash crop production	2,899	5,615	2,716	540	2,176

Obs). 1: Calculated based on "Profit without project" minus "Profit with project". "Profit with project" that is calculated on the basis of the data of the pilot project, is compared with "Profit without project" in terms of the amount of input described in "Reference of Chapter 7 Project Implementation Program". The cost borne by farmers is not included in "Incremental benefit".

Obs). 2: Calculated on the basis of credit and repayment conditions of the pilot projects with reference made to the table of the chapter 7: Investment Cost and No. of Beneficiary by Project.

b. Projects with provision of loan to entrepreneurs

An accumulated balance per farmers' organization in the fourth year amounts to US\$ 27,040, which outstrips the capital amount of US\$ 25,000, and the beneficiaries can afford the repayment of loan amount without difficulty. A total of ten farmers shall be affiliated with an organization and a projected accumulated balance of farm economy per farmer during ten years of the project is estimated in US\$ 11,874. On the other hand, one farmer may anticipate a net surplus of US\$ 137 shall be anticipated from the first year of the project. This project is thereby assessed as a project that hastens beneficiaries an aggressive involvement in the project.

Table: Cost, Profit, Loan Amount and Balance of the Project for Improvement for Marketing of Dairy Products

	Finance to Entrepreneurs	Y E A R									
		1	2	3	4	5	6	7	8	9	10
Cost											
Farm Investment	25,000.00					12,500.00					12,500.00
Input(Tank rehabilitation O/M Cost		2,280.00	2,280.00	2,280.00	2,280.00	2,280.00	2,280.00	2,280.00	2,280.00	2,280.00	2,280.00
Sub-total		2,280.00	2,280.00	2,280.00	2,280.00	14,780.00	2,280.00	2,280.00	2,280.00	2,280.00	14,780.00
Income											
Project Profit		8,100.00	16,200.00	18,900.00	21,600.00	24,300.00	24,300.00	24,300.00	24,300.00	24,300.00	24,300.00
Sub-total		8,100.00	16,200.00	18,900.00	21,600.00	24,300.00	24,300.00	24,300.00	24,300.00	24,300.00	24,300.00
Loan											
Capital	25,000.00										
Interest (12%)	12%	3,000.00	2,826.00	2,631.12	2,412.85	2,168.40	1,894.60	1,587.96	1,244.51	859.85	429.04
Repayment of Capital		4,450.00	4,450.00	4,450.00	4,450.00	4,450.00	4,450.00	4,450.00	4,450.00	4,450.00	4,004.33
Remaining Balance		23,550.00	21,926.00	20,107.12	18,069.97	15,788.37	13,232.98	10,370.93	7,165.44	3,575.30	0.00
Balance per Organization		1,370.00	9,470.00	12,170.00	14,870.00	5,070.00	17,570.00	17,570.00	17,570.00	17,570.00	5,515.67
Accumulated Balance			10,840.00	21,640.00	27,040.00	19,940.00	22,640.00	35,140.00	35,140.00	35,140.00	23,085.67
- Balance per Farmer		137.00	947.00	1,217.00	1,487.00	507.00	1,757.00	1,757.00	1,757.00	1,757.00	551.57
- Accumulated Balance			1,084.00	2,301.00	3,788.00	4,295.00	6,052.00	7,809.00	9,566.00	11,323.00	11,874.57

8.3 Environmental and Social Considerations

Targeting a total 13 projects of the Master Plan, the environmental and social considerations on each topic have been reviewed as explained hereinafter.

8.3.1 Environmental Considerations

(1) Negative Impacts

The projects of the present Master Plan aim in general at the improvement of agricultural and livestock activities of regional farmers without comprising large-scaled development works. It is thus considered that negative impact of the project on natural environment and ecosystem should be minimized. In the same way, the said projects hardly exercise negative impact on human health and security.

(2) Positive Impacts

Positive impact of the projects on each topic of environment is as indicated in the table below.

Table: Summary of Positive Impact of Environmental Consideration

Project Name	Atmosphere	Water Quality	Soil	Solid Wastes	Noise & Vibration	Land Subsidence	Nasty Smell	Geology & Topography	Biology and Ecosystem	Water Use	Accident	Global Warming
1.1 Upgrading of subsistence-oriented agro-products												
1.2 Raising farmer's income												
1.3 Improvement of milk productivity among marginal cattle farmers												
1.4 Support to cash crops production												
1.5 Improvement for marketing of dairy products												
2.1 Encouragement of agro-products processing industry												
2.2 Encouragement of dairy products processing industry												
2.3 Encouragement of rural handicrafts manufacturing industry												
3.1 Social and economic infrastructure development										○		
4.1 Promotion of reforestation	○	○	○						○			○
4.2 Strengthening of environmental education	○	○	○						○	○		
5.1 Functional strengthening of CREA												
5.2 Functional strengthening of INIAP												

8.3.2 Social Considerations

(1) Negative Impacts

With implementation of the projects of the Master Plan, the following negative impacts on social factors are considered.

Table: Summary of Negative Impact of Social Consideration

Project Name	Mobilization of population due to involuntary resettlement, etc.	Regional economy such as employment and means of income	Land Use and utilization of natural resources	Social organization relevant to social capital formation and regional decision making	Existing social infrastructure and social services	Socially disadvantaged strata such as the poor, indigenous people	Equitability on distribution of losses and benefit and on development process	Gender	Children's rights	Cultural heritage	Conflict of interests among benefited areas	Infectious Diseases such as HIV/AIDS
1.1 Upgrading of subsistence-oriented agro-products							△				△	
1.2 Raising farmer's income							△				△	
1.3 Improvement of milk productivity among marginal cattle farmers							△				△	
1.4 Support to cash crops production							△				△	
1.5 Improvement for marketing of dairy products							△				△	
2.1 Encouragement of agro-products processing industry							△				△	
2.2 Encouragement of dairy products processing industry							△				△	
2.3 Encouragement of rural handicrafts manufacturing industry							△				△	
3.1 Social and economic infrastructure development							△				△	
4.1 Promotion of reforestation			△									
4.2 Strengthening of environmental education												
5.1 Functional strengthening of CREA												
5.2 Functional strengthening of INIAP												

(2) Positive Impacts

Positive impacts could be caused in the following items:

Table: Summary of Positive Impact of Social Consideration

Project Name	Mobilization of population due to involuntary resettlement, etc.	Regional economy such as employment and means of income	Land Use and utilization of natural resources	Social organization relevant to social capital formation and regional decision making	Existing social infrastructure and social services	Socially disadvantaged strata such as the poor, indigenous people	Equitability on distribution of losses and benefit and on development process	Gender	Children's rights	Cultural heritage	Conflict of interests among benefited areas	Infectious Diseases such as HIV/AIDS
1.1 Upgrading of subsistence-oriented agro-products		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>				
1.2 Raising farmer's income		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>				
1.3 Improvement of milk productivity among marginal cattle farmers		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>				
1.4 Support to cash crops production		<input type="radio"/>	<input type="radio"/>									
1.5 Improvement for marketing of dairy products		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>							
2.1 Encouragement of agro- products processing industry		<input type="radio"/>										
2.2 Encouragement of dairy products processing industry		<input type="radio"/>										
2.3 Encouragement of rural handicrafts manufacturing industry		<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>				
3.1 Social and economic infrastructure development		<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
4.1 Promotion of reforestation		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>							
4.2 Strengthening of environmental education			<input type="radio"/>									
5.1 Functional strengthening of CREA		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>				
5.2 Functional strengthening of INIAP		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>						

9 Conclusions and Recommendations

9.1 Conclusions

The present Master Plan has been formulated on the basis of the analysis that had been made by the Japanese Study Team in collaboration with the Ecuadorian governmental agencies in the course of the relevant study together with pilot studies during four (4) years.

Table: Summary of the Conclusion of the Master Plan

Description	Explanation																		
Summarized outline of the Master Plan	The present Master Plan comprises 5 development components that are composed on 13 projects in total. It is scheduled that the said Master Plan should be implemented in 15 years, with a total cost of US\$ 20,693 million and a total number of beneficiaries amounting to 305 thousand farmers.																		
Constraints inherent to the target region	The poverty in the region is closely related with depressed income stemmed from agricultural and livestock activities and deficient employment opportunities within the region. The main cause for depressed agricultural and livestock income unfavorable land condition represented by steep topography and extremely limited farm size; in addition, inappropriate provision of institutional supporting services both in technical and financial aspects without raising farmers' income and lack of labor force engaging in farming activities as a consequence of exodus of male adult male leaving the region in search of job opportunities either for urban areas of the country or for foreign countries. Apart from the factor cited above, it is worthwhile to mention that public investment budget to be earmarked to local governments would be scarcely increased under austerity policy of the central government in Ecuador and that procurement of necessary fund to be allocated to the projects aiming at poverty reduction in rural areas would be faced with bottleneck in an absence of foreign investment under accumulated foreign debts.																		
Development potentials	Despite above-mentioned demerits, the climate condition in the region endowed with cool temperature and rainfall throughout the year allows to cultivate crops and to raise small animals, special products of the Andean Region having higher market value. In addition, diligent personality of people together with <i>Minga</i> -related activities, traditional cooperative organization of local people may be a positive factor for revitalization of regional economy and society.																		
Upper target and development components	The upper target under the present Master plan was set as "Revitalization of productive activities and poverty reduction". In order to accomplish the said upper target, the Master Plan, in accordance with analysis on prevailing constraints, envisages five development components, namely: "Upgrading living standard", "Improvement of agricultural and livestock sector", "Activation of non-agricultural sector" and "Environmental conservation". In addition, "Functional strengthening of public supporting organization" was added to the development component so as to accelerate accomplishment of the upper target.																		
Development subjects and implementation procedure	In relation with the development subject: "the projects contributing directly to raising farmers' income", it is proposed that production of subsistence-oriented crops should be intensified aiming at "Consistent agricultural production" and self-sustenance of foodstuff among households of farmers should be attained. Meanwhile, "Improvement of collection and shipment system of agricultural production" seeks for structuring marketing system to sell surplus agro-products within the region. Furthermore, "Promotion of higher value-added products" envisages production of cash crops, etc. aiming at raising farmers' income. The Master Plan shall be implemented in accordance with this order. On the other hand, "the projects depending on public investment" concern with "Development of social and economic infrastructure", "Environmental conservation" and "Functional strengthening of implementation and supporting organizations". Development of such social infrastructure as road network and irrigation system, premises for development of social and economic infrastructure, is scheduled to be implemented during the whole period of the Master Plan. The project relevant to reforestation and environmental education included in "Environmental conservation" shall be carried out in par with the progress of the Master Plan. The project related with "Functional strengthening of implementation and supporting organization", which is capacity building of public agencies rendering supporting services to project beneficiaries, shall be implemented continuously from setout to finalization of the Master Plan.																		
Specific projects	The table below comprises development subjects and development components together with projects aiming at attainment of these subjects and components. Table: Relations Among Development Agenda, Goals, Component and Projects																		
	<table border="1"> <thead> <tr> <th>Development Agenda</th> <th>Development Goals</th> <th>Development Components</th> <th>Proposed Projects</th> </tr> </thead> <tbody> <tr> <td rowspan="7">Contributing directly to raising farmer's income</td> <td rowspan="2">Consistent agricultural production</td> <td rowspan="5">1. Improvement of agriculture and livestock sector</td> <td>1-1 Upgrading of subsistence - oriented agro-products</td> </tr> <tr> <td>1-2 Raising farmer's income</td> </tr> <tr> <td rowspan="3">Expansion of production</td> <td>1-3 Improvement of milk productivity among marginal cattle farmers</td> </tr> <tr> <td>1-4 Support to cash crops production</td> </tr> <tr> <td>1-5 Improvement for marketing of dairy products</td> </tr> <tr> <td rowspan="3">Higher value-added of products</td> <td rowspan="3">2. Activation of non-agricultural sector</td> <td>2-1 Encouragement of agro-products processing industry</td> </tr> <tr> <td>2-2 Encouragement of dairy products processing industry</td> </tr> <tr> <td>2-3 Encouragement of rural handicrafts manufacturing industry</td> </tr> </tbody> </table>	Development Agenda	Development Goals	Development Components	Proposed Projects	Contributing directly to raising farmer's income	Consistent agricultural production	1. Improvement of agriculture and livestock sector	1-1 Upgrading of subsistence - oriented agro-products	1-2 Raising farmer's income	Expansion of production	1-3 Improvement of milk productivity among marginal cattle farmers	1-4 Support to cash crops production	1-5 Improvement for marketing of dairy products	Higher value-added of products	2. Activation of non-agricultural sector	2-1 Encouragement of agro-products processing industry	2-2 Encouragement of dairy products processing industry	2-3 Encouragement of rural handicrafts manufacturing industry
Development Agenda	Development Goals	Development Components	Proposed Projects																
Contributing directly to raising farmer's income	Consistent agricultural production	1. Improvement of agriculture and livestock sector	1-1 Upgrading of subsistence - oriented agro-products																
			1-2 Raising farmer's income																
	Expansion of production		1-3 Improvement of milk productivity among marginal cattle farmers																
			1-4 Support to cash crops production																
			1-5 Improvement for marketing of dairy products																
	Higher value-added of products	2. Activation of non-agricultural sector	2-1 Encouragement of agro-products processing industry																
			2-2 Encouragement of dairy products processing industry																
2-3 Encouragement of rural handicrafts manufacturing industry																			

	Depending on public investment	3. Upgrading of living standard	3-1 Social and economic infrastructure development
		4. Environmental conservation	4-1 Promotion of reforestation 4-2 Strengthening of environmental education
		5. Functional strengthening of public supporting organization	5-1 Functional strengthening of CREA 5-2 Functional strengthening of INIAP
Outcomes of the Master Plan	Owing to implementation of the present Master Plan, the relation between destitute farmers to be targeted and public supporting organizations shall be intensified bringing about as a consequence revitalization of activities undertaken by farmers/farmers' organizations. In view of the fact that the projects included in the Master Plan shall be carried out with the initiative taken by beneficiaries (farmers), an awareness of the beneficiaries on ownership of project shall be raised. Meanwhile, it is anticipated that an implementation of the projects should bring about capacity building/empowerment of personnel of the public sector in charge of provision of relevant supporting services to beneficiaries. Furthermore, awareness on interdependency among local people shall be raised through operation and management of organizations as well as group participation in acquisition of farming technologies, which, in turn, shall lead to succeeding traditional group activities remaining in the region.		
Conclusion of the Master Plan	By means of implementation of the development components of the present Master Plan together with specific projects to have been forged to materialize these development components, self-sufficiency of foodstuff among destitute farmers shall be achieved and farmer's income shall be elevated owing to an expansion of agricultural and livestock output leading to improvement of marketing for these outputs. In addition to intensification of such productive activities, an implementation of the projects of the Master Plan aims to promote highly competitive specific products of the region, increasing value-added of local products attributable to upgrading in quality and encouragement of agro-industry, and to revitalize overall productive sectors of the region. Besides, revitalization of these productive sectors shall encourage other industrial sectors of the region resulting in creation of more employment opportunity for local people.		

9.2 Recommendations

Reviewing on the Master Plan Study and implementation of six pilot projects, the following recommendations on implementation of the projects of the Master Plan have been elaborated by the Study Team.

Table: Summary of the Recommendation of the Master Plan

Description	Explanation
Functional strengthening of public supporting organizations	The projects of the Master Plan are proposed that they should be implemented basically with the initiative taken by farmers/farmers' organizations as core entity and the outcomes of the measures for functional strengthening of public supporting organization aiming at capacity building/empowerment of farmers shall affect considerably on attainment of overall goals of the Master Plan. The said public supporting organization are represented by CREA, INIAP, local governments, universities and NGOs, of which CREA, INIAP and local governments, directly concerned with implementation of development projects in rural area, are eligible organizations for intensive strengthening.
Preservation of existing rural organization	A traditional rural organization still remain in the target areas of the Master Plan, but its activity tends to be stagnated under the progress of depopulation of male adults leaving the region in seek of employment opportunity. Formation of farmers' organization is a focal factor for satisfactory implementation of the projects, it is thereby recommended to preserve existing rural organizations for preparing basis of this attempt.
Successive implementation of the pilot projects	The projects proposed in the present Master Plan are generally composed of such projects as to make small-scaled investment for each farmer, so procurement of necessary fund for successive implementation of the pilot project may be probable. Because public supporting organizations have acquired useful experience and know-how on implementation of the pilot projects, it is advisable that these pilot projects should be implemented successively for facilitating implementation of the Master Plan.
Urgent implementation of the Master Plan	The economic situation in Ecuador has varied drastically in recent years and it is likely that disparity among urban and rural sectors of the country is to be escalated year by year. In order to brake this unfavorable progress, it is desirable that the present Master Plan should be put into implementation as early as possible so as to contribute to poverty reduction in rural sector.

Implementation of high priority projects	The component: Improvement of agricultural and livestock sector, a high priority component among the components of the Master Plan, proposes consistent supply of hybrid seeds and improved species of small animal (<i>cu</i> y). It is essential to set out and continue the projects contributing to maintenance of these farm inputs.
Financing of projects' fund	For satisfactory attainment of project goals, durable implementation of project is a focal factor. As means of finance, the present Master Plan shall rely on general budgetary system in Ecuador, applying for allocation of budget from CREA, INIAP, provincial governments, municipal government, etc., but for overall implementation of the projects of the Master Plan, application of finance for another source is prerequisite. In this regard, besides securing necessary fund from governmental agencies mentioned before, it is required that projects implementation organizations should make every effort to procurement of fund from bilateral and multilateral financing institutions in addition to financing institutions of the country.
Request for technical cooperation	In view of upgrading technical field of the projects to be implemented, it is recommended that public agencies concerned with implementation of the Master Plan should make a request aid countries for technical cooperation; it is further recommended to apply supports form volunteer-related agencies of aid countries for revitalization of the projects.
Joint ownership of existing technologies and their utilization	A variety of public agencies represented by CREA and INIAP are rendering supporting services to marginalized farmers in Ecuador. These agencies hold individually useful technologies, know-how and extension methodology, without being integrated effectively. An advice is thereby given that interdependency and collaboration among these public agencies should be deepened seeking for provision of supporting services to farmers in more effective and efficient manner. In this connection, in an attempt to integrate experiences/opinions and technologies of these public agencies, a committee on regional development should be established and collaboration and alliance system among concerned agencies should be structured.
Environmental conservation	Environment-related projects are highly public-natured and outcomes/benefits of these projects should be assessed in the long run. Therefore, public supports relevant to environmental conservation should be rendered successively.

ECUADOR

STUDY ON DEVELOPMENT FOR REACTIVATION OF PRODUCTIVITY AND POVERTY REDUCTION IN THE CENTRAL-SOUTHERN REGION OF THE REPUBLIC OF ECUADOR

- FINAL REPORT -

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Abbreviation

	Spanish	English
BCE	Banco Central del Ecuador	Central Bank of Ecuador
BID	Banco Interamericano de Desarrollo	Inter-American Development Bank
BNF	Banco Nacional de Fomento	National Development Bank
CAF	Corporación Andina de Fomento	Andean Development Corporation
CFN	Corporación Financiera Nacional	Corporación Financiera Nacional
COPOE	Consejo de "Programación Obras de Emergencia"	"Emergency Work Scheduling" Council
CREA	Centro de Reconversión Económica del Azuay, Cañar y Morona Santiago	Center of Economic Reconversion of Azuay, Cañar and Morona Santiago
ETAPA	Empresa Publica Municipal de Telecomunicaciones, Agua Potable y Alcantarillado de Cuenca	Municipal Public Company of Telecommunications, Potable Water and Sewage System of Cuenca
EU	Unión Europea	European Union
FISE	Fondo de Inversión Social de Emergencia	Emergency Social Investment Fund
H.C.P.A.	Honorable Consejo Provincial del Azuay	Honorable Provincial Council of Azuay
H.C.P.C.	Honorable Consejo Provincial del Cañar	Honorable Provincial Council of Cañar
IGM	Instituto Geográfico Militar	Military Geographic Institute
INAMHI	Instituto Nacional de Meteorología e Hidrología	National Institute of Meteorology and Hydrology
INEC	Instituto Nacional de Estadística y Censos	National Institute of Statistics and Censuses
INECEL	Instituto Ecuatoriano de Electrificación	Ecuadorian Institute of Electrification
INERHI	Instituto Ecuatoriano de Recursos Hídricos	Ecuadorian Institute of Water Resources
INIAP	Instituto Nacional Autónomo de Investigaciones Agropecuarias	Autonomous National Institute of Agricultural and Livestock Research
Jardín Azuayo	Cooperativa Jardín Azuayo	Jardín Azuayo Cooperative
MAG	Ministerio de Agricultura y Ganadería	Ministry of Agriculture and Livestock
MA	Ministerio de Medio Ambiente	Ministry of Environment
ODEPLAN	Oficina de Planificación	Planning Office (Currently, called SENPLADES)
PROFAFOR	Programa Fase de Forestación en Ecuador	Afforestation Phase Program in Ecuador
SENPLADES	Secretaria Nacional de Planificación y Desarrollo de la Presidencia de la República	National Secretariat of Planning and Development
UMACPA	Unidad de Manejo de la Cuenca de Paute	Paute River Basin Control Unit
2KR	Second Kennedy Round (Asistencia Financiera No-Reembolsable para el Aumento de la Producción del Alimento)	Second Kennedy Round (Grant Aid for Increase of Food Production)

Statistics Information from following;

VI Censo de Población:	Population Censos No. Vi
III Censo de Nacional Agropecuario:	Agricultural Censos No.III
INFOPLAN:	Planning Information system
SIISE:	The Integrated System of Social Indicators of Ecuador

Table of Units and Others

Superficial and Volume

ha	:	hectare
Km ²	:	square kilo meter
mm ³	:	cubic millimeter
ℓ	:	liter
ℓ/day	:	liter per day
t/ha	:	ton per hectare

Distance and length

m	:	meter
Km	:	kilometer

Currency unit

US \$:	US Dollar (American currency)
Sucre	:	Sucre (Old Ecuadorian currency)

Administrative division

Canton	:	Canton mean the category of administrative division under the prefecture
Parroquia	:	Administrative division under the Canton.

Regional division

Costa	:	Costal area
Sierra	:	Andes Mountain area
Oriente	:	East Amazon river basin

Social index

GDP	:	Gross domestic product
TB	:	Gross weight
%	:	Ratio
EAP	:	Economic working population
INDIGENCIA	:	Indigence

Others

Silvipastril	:	That is the system which combines the livestock and trees, shrubs and fruits trees.
LL milk	:	Long life milk
Babaco	:	One specie of Andes fruits
Mora	:	One specie of Andes fruits, it look like mulberry fruits
Fondo de Semilla	:	Seed Bank
MINGA	:	It means joint work or volunteer work in the community as for that continuing from the Inca age.
Cambiamanos	:	Work synthesis aid in the Community

INTRODUCTION

CHAPTER 1

STUDY ON DEVELOPMENT FOR REACTIVATION
OF PRODUCTIVITY AND POVERTY REDUCTION
IN THE CENTRAL-SOUTHERN REGION
OF THE REPUBLIC OF ECUADOR

- FINAL REPORT -

August, 2005

CHAPTER 1 INTRODUCTION

1.1 Background of the Study

Ecuador, which is a mountainous nation located right on the equator in South America, has a population of 12.16 million and a territorial extension of about 261 thousand sq. km. The economic structure of the nation is highly dependent on petroleum and gas sector as well as on overseas remittance made by migrant workers. Close to 40% of the nation's population live in rural area, engaging in subsistence farming. The poverty ratio is extremely elevated in rural area, especially in mountainous region with an index of 74.5% (Source: SIISE3.5).

The Government of Ecuador put the dollarization of the nation's monetary system into effect in 2000 in an attempt to combat inflation, and had made effort to activate the national economy through strengthening the relationship with neighboring countries of the Andean Region. Nevertheless, contrary to their intention, the national economy had been aggravated due to a slump in the sale of country's agro-products brought about due to an inflow of a vast amount of agro-products from neighboring countries. As an outcome of this situation, the poverty condition in rural area has been accelerated. Under these circumstances, taking measures to stem an expansion of poverty condition has become a pressing agenda for the Ecuadorian Government and for this purpose re-structuring of agriculture aiming at strengthening its relative competitiveness is intended. On the other hand, an accumulation of external debt (amounting to about 75% of the GDP, source: Banco Central de Ecuador) is another source of anxiety in Ecuador and the Government of Ecuador is expected to make a rational allotment of the national budget as far as possible at a squeeze of budgetary fund.

In the light of such situation and in compliance with the austerity policy, the Ecuadorian Government is requested to take such efficient measures into effect as: fiscal policy aiming at sustainable activation of the agricultural sector, improvement of marketing system, strengthening supports to agricultural credit and technical assistance to farmers, rural development plan by means of encouragement and capacity building of rural organizations. And, in line with these measures, the Government intends to formulate development programs and projects in view of poverty reduction in rural sector as well as intensification of productive sectors.

Under the circumstances, the Project Formulation Study with focus laid on poverty reduction was carried out by Japan International Cooperation Agency (JICA) in January, 2001 and an agreement on conducting technical cooperation for formulation of a master plan for rural development plan that comprises, among others, cooperation with rural organizations and public supporting agencies, technical assistance relevant to farming activities and self-reliance of farmers. Following the said agreement, the present Study has been put into implementation.

The target areas under the present Master Plan have been identified as the provinces of Azuay and Cañar; these two provinces, which are located in steep mountain zone not suitable for conducting agricultural and livestock activities and are represented by small and marginal farmers, entail poverty factors that should be relaxed in Ecuador in such manner as higher poverty ratio in rural area (60.4% in Azuay and 79.4% in Cañar, compared with 58.4% of the national average, UNDP-Ecuador 1999) and higher proportion of destitute farmers.

The counterpart agency of the present Study is CREA (The Center of Economic Recovery of the Azuay, Cañar and Morona Santiago), a public agency affiliated to the Ministry of Presidency, which is responsible for planning and implementation of projects relevant to agricultural and livestock development with focus laid on irrigation-related projects, environmental conservation and improvement of living standard/enhancement of household economy among destitute families as well as for forging regional development plan.

1.2 Objectives of the Study

The objectives of the Study are as follows:

- (1) *To formulate a Master Plan for reducing poverty in the rural areas of Ecuador's Central-Southern region focused on the Provinces of Azuay and Cañar, that fits the needs of the rural poor by identifying factors that impede solution of the problem.*
- (2) *To carry out technology transfer to the Ecuadorian counterparts in order to strengthen the capacity of the organizations concerned.*

1.3 Study Area

The Study Area covers the Provinces of Azuay and Cañar in Ecuador (Territorial extension: 11, 175 km² and total population: about 810 thousand, of which rural population accounts for about 420 thousand)

1.4 Study Period

The Study was started in November, 2002 and shall be completed in August, 2005

1.5 Reports

The reports to have been submitted are as follows:

No.	Reports	Contents	Submission Date
1.	Inception Report	Basic Concepts, Scope, Methodology and Schedule of the Study	End of Oct., 2002
2.	Progress Report (I)	Results of the Phase I Field Works	Middle of Feb., 2003
3.	Interim report (I)	Results of the Phase I Field Works and Home Office Works, Draft Master Plan	Middle of May, 2003
4.	Progress Report (II)	Pilot Projects	Middle of Feb., 2004
5.	Interim report (II)	Interim Appraisal of the Draft Master Plan	Middle of May, 2004
6.	Progress Report (III)	Monitoring on the Pilot Projects	Middle of Feb., 2005
7.	Draft Final Report	Overall Study, Comprehensive Appraisal, Recommendations, etc.	Beginning of March, 2005
8.	Final Report	Overall Study, Comprehensive Appraisal, Recommendations, etc.	End of August, 2005
9.	Executive Summary	Executive Summary of the Study	End of August, 2005
10.	Technical Manual	Technical Manual of Pilot Projects	End of August, 2005

SOCIO-ECONOMIC PERFORMANCE OF ECUADOR

CHAPTER 2

STUDY ON DEVELOPMENT FOR REACTIVATION
OF PRODUCTIVITY AND POVERTY REDUCTION
IN THE CENTRAL-SOUTHERN REGION
OF THE REPUBLIC OF ECUADOR

- FINAL REPORT -

August, 2005

CHAPTER 2 SOCIO-ECONOMIC PERFORMANCE OF ECUADOR

2.1 General Characteristics of Ecuador

Principal socio-economic indicators of the Republic of Ecuador is as summarized hereinafter.

Table: Ecuador at a Glance

Land area	260,796 km ²
Land Use	Non-agricultural Use; 180,524 km ² (69.2%) Agricultural Use; 80,273 km ² (30.8%) <ul style="list-style-type: none"> • Grazing land (62.5%), Arable land (23.6%), Fallow land (3.1%), Other Use(11.8%)
Demography	Total population (As of 2001): 12,156,608 <ul style="list-style-type: none"> • Growth rate (1990~2001): 2.1%/year • Birthrate: 3.39% • Male population: 6,018,353 (49.5%) • Female population: 6,138,255 (50.5%) • Urban population: 7,431,000 (61.1%) • Rural population: 4,725,000 (38.9%) • Illiteracy rate: 9% • Economically active population: 4,553,746 • Unemployment rate (As of December, 2000); 10.3% • Incomplete employment rate: (As of December, 2000): 49.9%
Economy (GDP)	<ul style="list-style-type: none"> • GDP (2001): US\$ 20,500 million (Accounting for 0.06% of the total amount of GDP in the world and 0.2% of USA's GDP) • GDP per capita (2001): US\$ 1,564 • Import amount (2002): US\$ 2,058 million • Export amount (2002): US\$ 1,432 million • Trade balance (2002): US\$-626 million
National Budget	<ul style="list-style-type: none"> • Fiscal budget in 2002: US\$ 1,318 million • External debt: US\$ 15,400 million
Evolution of Economic Performance	Evolution of economic structure <ul style="list-style-type: none"> • Up to the 1960s; National economy was dependent on such agricultural exports as coffee, cacao and banana (afterwards: 1949 – 1950). • Since the 1970s; National economy has been inconsistent with dependence on export of petroleum exploited in eastern region which is highly influenced by external factor like production level in oil-producing countries other than Ecuador and condition of foreign market as well as on remittance made by migrant workers abroad.
Poverty	Human Development Index: 0.747 (72 nd place out of 174 countries; UNDP 1999) 5% of the population accounts for 25% of the total income of the country, meanwhile poverty strata representing 30% of total population cover a small portion as 7.5% of the total income of the country.

Sources: VI Censo de poblacion, V de Vivienda (SIISE 3.5), III Censo Nacional Agropecuario, Banco Central de Ecuador, Sobre Informe de Desarrollo Humano (UNDP – Ecuador, 1999)

2.2 Socio-economic Conditions

The economic structure in Ecuador is represented by agricultural exports; coffee and cacao had been the major agricultural exports until 1960s, and afterwards (1949 – 1950) it was represented by banana. Despite agricultural goods have maintained consistent production, their contribution to the national economy has been less significant as an exploitation of petroleum and gas is advanced.

In 2001, the GDP in Ecuador amounted to US\$20,500 million and the trade balance in 2002 was US\$626 million in deficit, with the imports of US\$2,058 million and the exports of US\$1,432 million. The sector of petroleum and gas accounted for 24% of the GDP and the Ecuadorian economy is heavily influenced by the fluctuation of oil price at international market. Remittance from other countries is also major economic sector and its amount (US\$2,300 million) is almost equal to that of the manufacturing sector.

The economic situation in Ecuador has been worsened since the latter half of 1997 as a consequence of depressed oil price at international market, damages and losses caused by El Niño phenomenon and other factors, which incapacitated the government to control inflation. As a measure against inflation,

the dollarization of the country's monetary system was put into force, but this policy has motivated upsurge of prices and inflow of competing goods from neighboring countries, especially those produced in less competitive industries, this is particularly the case with the agro-products except for banana. It is worth while to indicate that the said declined competitiveness of agro-products had led to worsen farming environment in regions where there had been a source of supply of agro-products to the cities located adjacent to the border area with Colombia and Peru.

As the number of migrant workers abroad increases, the depopulation in rural areas is accelerated and, as a result, labor force in rural area becomes heavily dependent on female, aged and immature strata. In the light of this situation, the leading farming activity in rural area tends to be shifted from marginal crop production to marginal cattle farming, and the rural economy has become more dependent on marginal cattle farming and remittance by overseas migrant workers; this phenomenon is more conspicuously in the rural area, in which remittance made by migrant worker living abroad has played more important role in their economic performance year after year.

2.3 National Development Policies

The administration of the present President Gutierrez that came to office in 2003 had forged a Pluriannual National Government Plan for the period 2003 – 2007 which focuses on the following five policies, namely:

1. Combating corruption
2. Eradication of poverty and creation of new employment opportunity against jobless persons
3. Attainment of civil, social, juridical, food and environments security
4. Increased competitiveness through revitalization of productive activities and enhancement of productive ability of farmers
5. Structuring of modern nation through reform of international and national policies

With regard to combating corruption, four targets: (1) Strengthening auditing function on government's expenditure, (2) Raising a sense of morality, (3) Recovery for trust of people on public agencies and (4) Fostering democracy were held up.

And, in so far as eradication of poverty and countermeasures against unemployment are concerned, such numerical goals as: to lower poverty index to 38% (Source: SIISE 3.5), to improve illiteracy rate from 10% to 8%, and to raise accessibility to medical services from 75% to 83% were set, and aiming at achievement of these goals, it was proposed to take the relevant measures to upgrading the living standard, improvement of education system and, raising accessibility to medical services and creation of new employment opportunity.

Meanwhile, strengthening of guard services against protecting citizens, protection of investment environment contributing to international development against juridical stabilization, conservation and rational utilization of natural resources aiming at their sustainability against environmental security, improvement of insurance system against social security, and intensification of productive activities against food security were forged respectively.

In connection with revitalization of productive activities and enhancement of productive ability of farmers, it was disclosed as a result of analysis that relevant problems of the country were rooted in: (1) Inveterate deficit in current balance, (2) Heavy dependence on oil-related economy, (3) Depressed tax revenue, (4) Tax revenue dependent on indirect tax and (5) Enormous foreign debt, and that these factors all together have caused stagnated economic performance, high inflation rate and deficit in international balance of payments. On the basis of this analysis, the goals of the national economy were set to attain 3.5% (6.6% in 2004) of annual growth rate in GDP and to control inflation rate lower than 6% (1.9% in 2004) per annum. As a measure to achieve these goals, it was proposed to hasten the dollarization policy subject to implementation of financial reform, to promote participation of strategic products in the international market, to back up small and medium-scaled enterprises (tourism and handicraft manufacturing, etc.) aiming up generating employment opportunities, to

accelerate development of infrastructure (including irrigation system) as a basis for economic activities and so on.

As for reform of foreign and domestic policies, it was envisaged territorial defense, entering into international agreement, participation in regional free trade agreement, protection of overseas migrant workers, reception of various grant aids, etc.

2.4 Agricultural Sector

2.4.1 Agricultural Policies

The National Development Plan 2003 – 2007 gave priority policies in the area of agricultural and livestock sector to: introduction of fiscal and marketing promotion measures aiming at sustainable revitalization of the agricultural and livestock sector, intensification of productive activities by fostering agricultural credit system and institutional supporting services, sustainable management of natural resources in line with land use plan, promotion of rural development with participation of rural organizations represented black and indigenous people and deepening of linkage between farmers and social organizations like public supporting agencies. As a plan of actions, strategies were forged with regard to five agendas (Competitiveness, International Negotiation, Rural, Agricultural and Livestock, Agro-forestry, Agro-industry and Irrigation System Developments, Food Security and Capacity Building of Public Supporting Agencies)

Detailed contents of respective strategy are as mentioned hereinafter.

(1) Consolidation of Competitiveness

Specific measures for deepening competitiveness of agro-products are as follows.

- Production of higher quality and value-added products (Organic products, quality guaranteed products, post-harvest processing and storage)
- Promotion for decentralization
- Production programming in accordance with land use plan and sustainable natural resources management plan
- Development of agricultural information system
- Development of human resources
- Study on section and organization system
- Promotion for exchange of opinions between private sector and public sector
- Establishment for coordination mechanism among concerned agencies and institutions
- Increased efficiency of procedures relevant to foreign trade
- Formulation of strategic plans by sector

(2) International Negotiation

- Promotion for provision of credit and technical cooperation to local governments (Agreement between central government and local governments, bilateral agreement and strategies, etc.)
- Strengthening of international negotiation groups
- Strengthening of capability in multilateral negotiation (ALCA, OMC, MERCOSUR, CAN, etc.)
- Supports to marketable agro-products and agricultural processed goods at international markets.

(3) Regional Development, Agricultural and Livestock Development, Promotion for Agro-forestry, Agro-processing and Irrigation system

- Empowerment for representative of local governments

- Development of agriculture and livestock sector with emphasis laid on export-oriented traditional farming and unconventional farming
- Raising farm productivity
- Arousing competitive spirit
- Intensification of technical assistance in response to farmers' request
- Empowerment of rural entrepreneurs among farmers' associations
- Renovation of irrigation system
- Legislative reform on water use, local organization and seeds, etc.
- Provision of credit to lands development program

(4) Food Security

- Implementation of the national food security plan
- Formulation of natural disaster mitigation plan
- Support to emergency disasters
- Formulation of food security plan targeting destitute people

(5) Capacity Building: Ministry of Agriculture and Livestock

- Capacity building of the Ministry of Agriculture and Livestock
- Strengthening of coordinating mechanism among sections
- Structural reform of affiliated agencies and institutions
- Transparency in process
- Empowerment in planning capacity
- Others

2.4.2 Performance of the Agricultural Sector

(1) Share to GDP by Sub-sectors of the Agricultural Sector

The agricultural sector absorbs close to 40% of the economically active population, but its productivity is extremely depressed with a contribution to the GDP as few as 8.4%. The majority of farmers engage in farming of traditional crops and in raising of cattle and the products derived from these activities share only 3.8% of the GDP.

Table: Contribution to GDP by Sub-sector of Agriculture, Livestock and Forestry Sector

Sub-sectors	Share to total Agricultural Product (%)	Share to GDP (%)
Total Agriculture Sector	100.0	8.4
Export-oriented crops (Banana, cacao, flower, etc.)	43.1	3.6
Traditional crops	25.1	2.1
Livestock	20.4	1.7
Fishery	16.7	1.4
Forest	11.5	1.0

Source: Estimated based on information of Banco Central de Ecuador

(2) Land Use by Purpose

Close to 2,970 thousand ha., equivalent to 24.1% of the national territory, are used as arable and grazing lands account for 4,490 thousand ha, 36.3% of the national territory.

Table: Land Use by Purpose

Land Use	Area (ha)	Percentage
Agriculture sector in total	12,355,831	100.0
Permanent crops	1,363,400	11.0
Annual crops	1,231,675	10.0
Fallow land	381,304	3.1
Managed pasture	3,357,167	27.2
Natural pasture	1,129,701	9.1
Paramo (Highland pasture)	600,264	4.9
Forest	3,881,140	31.4
Others	411,180	3.3

Source: III Censo Nacional Agropecuario – Datos Nacionales

(3) Major Agricultural and Livestock Products

The leading crops in Ecuador are composed of corn, rice, kidney beans (Frijoles); in Inter-Andean region corn, kidney bean, pea and potato are mainly cultivated, meanwhile permanent crops prevail in coastal region.

Table: Share of Major Agricultural Products

Annual Crops	Cultivated Area (ha)	Inter-cropped Cultivated Area (ha)	Total (ha)	Permanent Crops	Cultivated Area (ha)	Inter-cropped Cultivated Area (ha)	Total (ha)
Rice	343,936	5,790	349,726	Banana	180,331	85,793	266,124
Pea	5,919	2,188	8,107	Cacao	243,146	191,272	434,418
Kidney bean	19,438	85,689	105,127	Coffee	151,941	168,970	320,911
Corn	349,346	122,199	471,545	Sugarcane for sugar	82,749	75	82,824
Potato	47,494	2,225	49,719	Multi-purpose sugarcane	42,606	6,422	49,028
Soybean	54,350	1,630	55,980	Passion fruit	28,747	2,892	31,639
Sub-total	820,483	219,721	1,040,204	African palm	146,314	15,888	162,202
				Plantain	82,341	101,258	183,599
				Tree tomato	4,062	785	4,847
				Sub-total	962,237	573,355	1,535,592

Source: Estimated based on data included in III Censo Nacional Agropecuario-Datos Nacionales

Livestock sector is represented by raising of cattle, swine and sheep; cattle and sheep farming prevails in mountain region and dairy cattle farming is concentrated in mountain region.

Table: Livestock Production (No. of Head)

Region	Beef Cattle (Hybrid)	Dairy Cattle (Hybrid)	Dual-purpose cattle			Total Cattle	Milk Production (l)	Swine	Sheep
			(Hybrid)	(Criollo)	(Cross-bred)				
Mountain	6,883	30,621	8,444	1,667,322	560,866	2,274,137	2,565,572	986,219	1,108,549
Coast	27,767	7,841	5,932	558,502	1,028,002	1,628,044	649,625	454,771	10,522
Other region	1,786	711	1,203	202,907	377,233	583,839	309,830	86,124	8,397
Total	36,436	39,173	15,579	2,428,731	1,966,101	4,486,020	3,525,027	1,527,114	1,127,468

Remarks: Dual purpose cattle means Beef cattle and Dairy cattle

Source: Estimated based on data included in III Censo Nacional Agropecuario - Datos Nacionales

Farming of minor livestock is as given in the table below. These animals are mainly raised in mountain region.

Table: Minor Livestock Production (No. of Head)

Region	Horse	Mule	Goat	Alpaca	Llama	Rabbit	Cuy
Mountain	189,191	56,451	151,642	1,897	20,995	511,836	4,804,614
Coast	127,967	57,960	25,957	77	314	2,452	71,969
Other region	58,602	15,680	768	50	353	1,521	190,466
Total	375,760	130,091	178,367	2,024	21,662	515,809	5,067,049

Remarks: Other regions comprise Oriente Region and Galapagos Islands

Source: Estimated based on data included in III Censo Nacional Agropecuario-Datos Nacionales

2.5 Poverty

In Ecuador, higher income strata representing close to 20% of the total population account for 63.43% of the total income of the country, meanwhile poverty strata representing more than 20% of the total population cover as small portion as 2.16% of the total income of the country (Source: INEC, Encuesta de condiciones de vida 1995, Fundacion Jose Peralta, Ecuador, 2001 - 2002).

The poverty condition is defined in Ecuador, as “Deficient condition in structural capability of household bringing about the fulfillment of the minimum requirement and indispensability”. Referring to the research on poverty carried out in 2000, it was disclosed that poverty strata expended less than US\$ 55/month/capita for household (food, schools, water and energy, transportation, clothes and medical expenses) and extreme poverty strata expended below US\$ 28/month/capita, defining that the strata has no access to caloric intake of the minimum requirement.

The poverty strata in urban area cover 33% of the regional population in the Costa Region and 35% on Sierra Region, meanwhile that in rural area represented 72.7% and 74.5%, respectively. On the other hand, in the rural area of Oriente region, the proportion of poverty strata and extreme poverty strata represented 87% and 62.6%, respectively.

Table: Proportion of Poverty and Extreme Poverty Strata (%)

	Regions	Urban Area	Rural Area
Poverty Strata	Costa	44.2	72.7
	Sierra	35.1	74.5
	Oriente	35.8	87.1
	Galápagos	—	39.6
Extreme Poverty Strata	Costa	8.6	22.4
	Sierra	9.5	19.7
	Oriente	6.7	62.6
	Galápagos	—	12.1

Source: FUNDACION JOSE PERALTA, Ecuador: Su Realidad, Ed. 2001-2002.

And, the proportion of poverty and extreme poverty strata by province is summarized below.

Table: Proportion of Poverty and Extreme Poverty Strata by Province (%)

Region	Provinces	Poverty	Ext. Pov.	Region	Provinces	Poverty	Ext. Pov.
Costa	Esmeraldas	58.2	18.5	Sierra	Loja	67.4	23.9
	Manabí	57.1	16.4		Cotopaxi	69.2	20.5
	Los Rios	60.3	16.0		Imbabura	58.6	19.2
	Guayas	52.1	14.4		Chimborazo	64.0	18.9
	El Oro	38.3	5.8		Carchi	63.6	18.5
Oriente	Napo	83.7	62.5		Bolivar	70.2	18.3
	Sucumbios	84.0	55.3		Cañar	63.4	16.7
	Morona Santiago	77.2	51.8		Pichincha	45.1	11.1
	Zamora Chinchipe	78.0	42.7		Azuay	47.7	9.6
	Pastaza	62.6	42.0		Tungurahura	51.6	9.6
				Galápagos	Galápagos	39.6	12.1

Source: FUNDACION JOSE PERALTA, Ecuador: su realidad, Ed. 2001-2002, tomada de la Secretaría Técnica del Frente Social; Modelos de Proyección de la Encuesta de Condiciones de Vida de 1994 al censo de 1990.

STUDY AREA

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CHAPTER 3 STUDY AREA

3.1 General Features

3.1.1 The Study Area at a Glance

The Study Area consists of the provinces of Azuay and Cañar, which are located in the Inter-Andean or Sierra Belt, toward the south of the Ecuadorian territory, having combined land area of 11,175 km² and a total population of 810,000 as of 2001. The general features of the Study Area are as summarized below.

Table: The Study Area at a Glance

	Province of Azuay	Province of Cañar
Surface	<ul style="list-style-type: none"> Area: 8,020 km² (3.1% of the country) Occupied by APU; 6,120 km² (76.3%) Other Areas: 1,900 km² (23.7%) 	<ul style="list-style-type: none"> 3,155 km² (1.2% of the country). Occupied by APU; 2,582 km² (81.9%) Other Areas: 573 km² (19.1%)
Population	<ul style="list-style-type: none"> Total: 599,546 (4.9% of the country) Urban: 312,594 (52.1%) Rural: 286,952 (47.9%) Demographic density: 74.7 H/Km². Growth Rate (90-01): 1.6%/year Percentage of population by age group 0 – 5 years: 21.5%, 6 – 11 years: 22.4% 12 – 17 years: 21.9%, 18 – 24 years: 22.1% Older than 24 years: 12.1% 	<ul style="list-style-type: none"> Total: 206,981 (1.7% of the country) Urban: 75,601 (36.5%) Rural: 131,380 (63.5%) Demographic density: 65.6 H/Km². Growth Rate (90/01): 1.4%/year Percentage of population by age group 0 – 5 years: 21.9%, 6 – 11 years: 23.5% 12 – 17 years: 23.2%, 18 – 24 years: 19.3% Older than 24 years: 12.1%
Economic Structure	<ul style="list-style-type: none"> Contribution to the GDP: 5.43% (1996) Number of enterprises: 3.45% of the total enterprises in the country 	<ul style="list-style-type: none"> Contribution to the GDP: 0.89% (1996) Number of enterprises: 0.18% of the total enterprises in the country
Land Use	<ul style="list-style-type: none"> Arable land: 1,854 km² (23.1 %) Pasture: 1,875 km² (23.4%) Other Use: 4,291 km² (53.5%) 	<ul style="list-style-type: none"> Arable land: 800 km² (25.2 %) Pasture: 684 km² (21.7 %) Other Use: 1,671 km² (53.1%)
Political Division	<ul style="list-style-type: none"> 15 Cantons (86 Parroquias) 	<ul style="list-style-type: none"> 7 Cantons (35 Parroquias)

Source: VI Censo de Poblacion, V de Vivienda 2001, (SIISE V3.5)

3.1.2 Political Administration

(1) Political Division

Ecuador consists of 22 provinces, which, are divided into cantons, corresponding to cities or counties. Town; these cantons, in turn, are divided into parroquias, the lowest administrative bodies in the country, composed of various communities. The Province of Azuay consists of 15 cantons and 86 parroquias, meanwhile the Province of Cañar consists of 7 cantons and 35 parroquias.

Each level of administrative body has a head who is appointed by the President; the head of province is called as *Gobernador* (Governor) and that of canton and parroquia as *Jefe Política* (Political Head) and *Teniente Política* (Political Officer). It should be pointed out, although, that each autonomous body is entitled to have the right of self-government and administrative power falls on the hand of the head of autonomous body who is elected by popular vote. The autonomous bodies are composed administratively of three levels, namely, province, canton and parroquia, and each level of autonomous body is represented by *Prefecto* (Civil Governor) for province, *Alcalde* (Mayor) for canton and *Presidente* (President) for parroquia. In addition, a council called as *Consejo* is organized for each autonomous body.

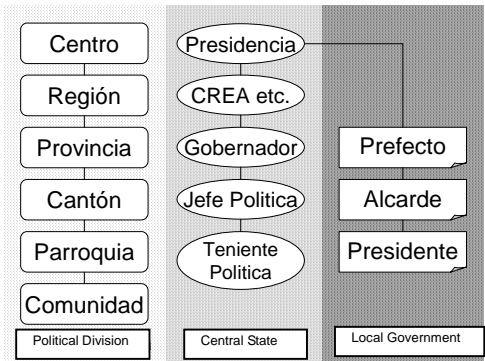


Figure: Political Division of Ecuador

(2) Administrative Organization

An administration organization in Ecuador is formed by 15 ministries within the central government, putting the Ministry of Presidency the top of the ministries and establishing regional offices in each province. The Ministry of Presidency holds a couple of advisory councils and a bureau responsible directly for regional development is affiliated to the Ministry of Presidency. CREA (Centro de Reconversión Económica del Azuay, Cañar y Morena Santiago – Economic Restructuring Center of Azuay, Cañar and Morena Santiago), the implementation agency of the present Study, is one of the agencies under the direct control of the Ministry of presidency and undertakes regional development in Azuay, Cañar and Morena Santiago provinces. Action plan of CREA is as summarized hereinafter.

Action Plan of CREA

- *To participate in planning and implementation of sustainable regional development*
- *To give advisory service and to coordinate implementation programs to the organizations of various fields, regardless of public or private ones and domestic or foreign ones which engage in rational use of natural resources and seek for sustainable development in the area under control of CREA.*
- *With regard to sustainability and conservation of natural resources, to support productive sector, agriculture and livestock, small-scaled enterprises, folk handicraft manufacturing sector, eco-tourism, and mining sector existing in the region under control of CREA; in particular, special attention shall be paid to the frontier zone of the province of Morona Santiago.*
- *In coordination with agencies in charge of planning of sustainable development and implementation of specific programs, to monitor and assess progress and outcome of these programs.*
- *To undertake periodical evaluation on benefits and impacts of public policies, especially, economic policies relevant to the region under control of CREA, and to propose, in necessary, alternative policies to the central government.*

It is worth while to indicate that, under progress of decentralization policy, budgetary allocation to the public agencies directly affiliated to the Central Government like CREA tends to decline resulting in reduction of implementation projects.

And, INIAP (Instituto Nacional Autónomo de Investigaciones Agropecuarias – National Autonomous institute for Agriculture and Livestock Investigation), an affiliated research institution of the Ministry of Agriculture, has an office within the region. INIAP has research facilities throughout the country and is an autonomous institution in charge of research programs and projects with the budget of the central government and in response to the request of regional governments. INIAP renders supporting services to destitute farmers by means of breed improvement of agricultural products, research on crop cultivation method, production and distribution of improved varieties, etc., and its activities, together with those of CREA, play an important role in supporting destitute farmers. Within the Study Area of the present Master Plan, two research facilities of INIAP are in active; one is Bullcay Experimental Farm which undertakes indoor research and investigation and production of improved varieties and seeds at farm and the other is Chuquipata Experimental Farm which focuses on production of improved seeds with emphasis lain on cereals. Besides, INIAP develops research and investigation programs and project nationwide and may be relied on supports from experimental farms outside the region.

(3) Public Services

The provinces of Azuay and Cañar are divided into eastern sector and western one by Molleturo Range which penetrates the provinces from north to south; western sector is featured by low population density, meanwhile the eastern sector in which the cities of Cuenca (Azuay Province) and Cañar (Cañar Province) are located has higher population density. Due to this geographic condition, social infrastructures have been developed in favor of the eastern sector of the Molleturo Range.

Road network may be divided into classes: main trunk road (under jurisdiction of the Ministry of

Public Works), economically important system to connect provinces, secondary trunk road to connect cantons, tertiary trunk road to connect parroquias, rural road (under jurisdiction of canton and parroquia) to connect rural areas and district road (under jurisdiction of parroquia). Trunk roads are equipped with toll gates and a public corporation undertakes maintenance of this road system collecting tolls.

Development of road network in the Province of Azuay as of 2001 is as given below.

Table: Road Network Development in the Province of Azuay

RED	Road Development Status						Un-Paved(km)	Total (km)
	Asphalt Pavement (km)			Gravel Pavement (km)				
	Good	Regular	Poor	Good	Regular	Poor		
Main trunk road	52.00	416.60	82.00	0.00	50.70	0.00	0.00	601.30
Secondary trunk road	0.00	32.30	0.00	18.50	53.50	18.00	9.00	131.30
Tertiary trunk road	21.00	46.00	31.90	135.00	335.70	313.60	40.80	924.00
Rural road	0.00	3.60	0.00	74.80	300.30	497.30	416.50	1,292.50
Subtotal	73.00	498.50	113.90	228.30	740.20	828.90	466.30	2,949.10
Percentage	10.65	72.73	16.62	12.70	41.18	46.12		
Total	685.40			1,797.40			466.30	
Percentage	23.24			60.95			15.81	

Source: Consejo Provincial del Azuay (Informe de julio del 2001)

Tertiary trunk road network accessible to rural area has a total length of 924 km consists of 31.9 km of asphalt pavement, 313.6 km of gravel pavement and 40.8 km of unpaved sector, of which the proportion corresponding to 42% of the total length is assessed in poor condition and is thereby required to be rehabilitated urgently. In so far as rural road is concerned, the length with asphalt pavement remains only 3.6 km, meanwhile gravel pavement, which is reported in poor condition, has a total length of 497.3 km and unpaved sector amounts to 416.5 km in total. It is evaluated that the section equal to 71% of the total length of rural road (1,292.5 km) requires to be rehabilitated.

Development of water supply and sewerage systems is undertaken by municipal governments and corporations for urban sector and by the Ministry of Housing and Metropolitan Development for rural sector. It is worth while to point out that public services for the city of Cuenca, the third largest city in Ecuador, are undertaken by ETAPA (Municipal Public Enterprise of Cuenca for Telecommunications, Water Supply and Sewerage). Accessibility to water supply among residences in rural area is about 35% (59.5% in Azuay and 36.0% in Cañar) and that to sewerage services among residences in rural area is about 30% (57.0% in Azuay and 35.2% in Cañar). This accessibility is lowered as the communities located far from the urban area.

Development status of water supply and sewerage systems is as summarized in the following table.

Table: Development of Water Sewerage in Rural Households by Province

Province of Azuay			Province of Cañar		
Canton	Equipped with Water Supply System	Equipped with Sewerage System	Canton	Equipped with Water Supply System	Equipped with Sewerage System
Cuenca	71.3	70.7	Azogues	53.1	46.6
Girón	49.1	39.6	Biblian	40.5	31.4
Gualaceo	37.2	27.1	Cañar	32.1	22.6
Nabon	19.1	13.7	La Trocal	14.2	40.4
Paute	33.7	26.4	El Tambo	40.7	38.5
Pucara	15.7	10.5	Deleg	34.8	16.8
Camilo Ponce	35.3	30.1	Suscal	19.1	18.3
San Fernand	43.4	40.7	Average	36.0	35.2
Santa Isabel	34.4	30.7	Source: SIISE3.5 (2001)		
Sigsig	24.5	20.5			
Oña	23.9	15.8			
Chordeleg	35.2	29.9			
El Pan	29.3	21.2			
Sevilla de Oro	36.0	33.7			
Guachapala	43.6	34.0			
Average	59.5	57.0			

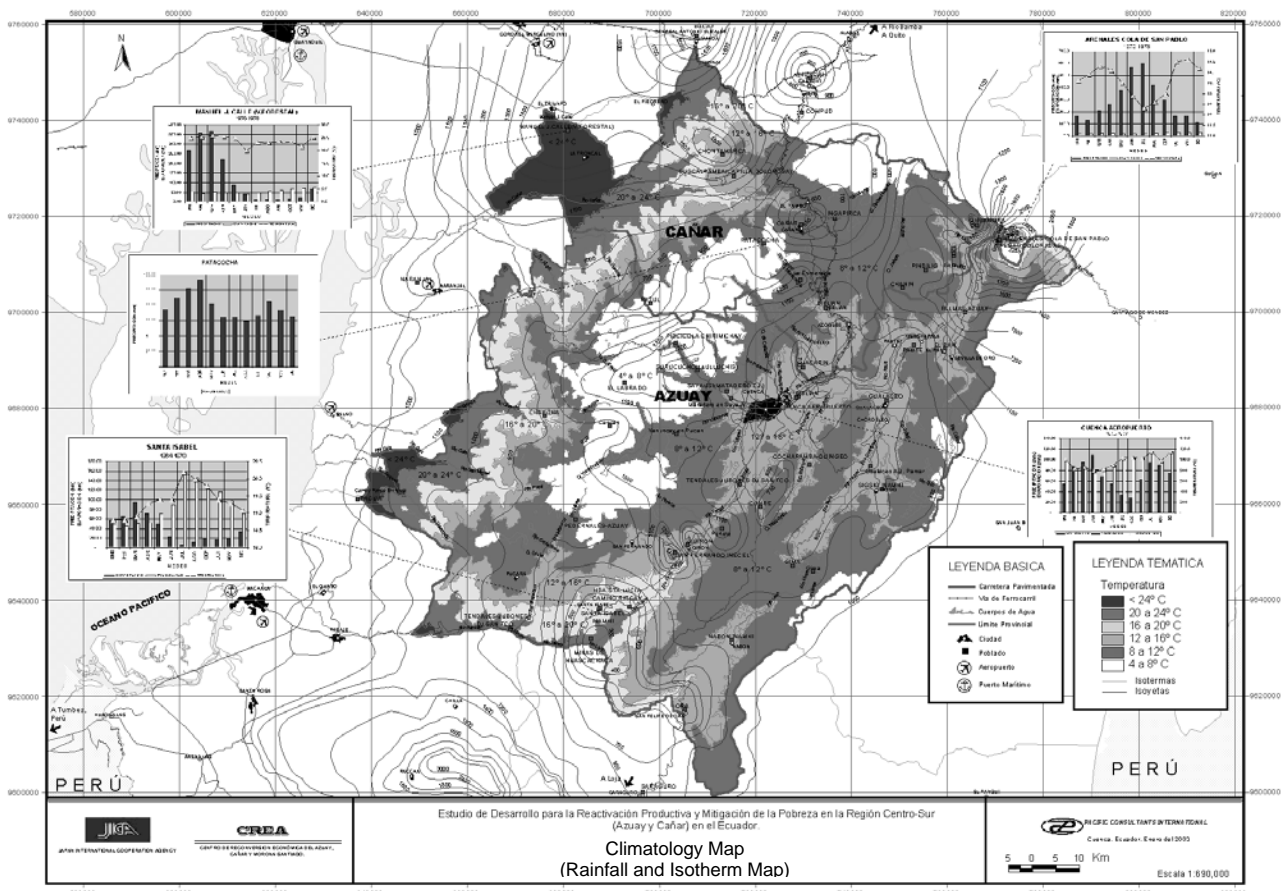
Source: SIISE3.5 (2001)

3.1.3 Natural Conditions

The Study Area is scattered over the land with an altitude ranging from 50 m.a.s.l to 4,500 m.a.s.l., of which highland area exceeding 2,000 m.a.s.l occupies 75.6% of the total land area. The area is also located within the watershed of the Amazon basin and the Pacific Ocean basin. This area consists of 6 river basins, of which 5 basins flow out to the Pacific Ocean and the remaining one flows to the Amazon. The three sub-basins represented by Paute (about 4,600 km² of basin area and about 4,400 million m³ of annual discharge), Jubones (about 2,400 km² of basin area and about 1,700 million m³ of annual discharge) and Cañar (about 2,100 km² of basin area and about 2,000 million m³ of annual discharge) constitute an important water resources for the inhabitants of the Study Area. Within upper reach of these sub-basins, reservoirs amounting to 150 or so have been constructed.

Due to topographic condition, the climate of the area is diversified; in principal, the tropical forest climate prevails in lower land sector, meanwhile the tropical highland climate dominates in higher land sector. In so far as rainfall is concerned, higher precipitation is observed in the basins of the Jubones River and the Paute River. Generally speaking, lower precipitation season is in June thru in September, transition season falls during October – January, and higher precipitation season coincides with the period February – May. On the other hand, the temperature varies according with land elevation; in the sector with altitude ranging from 2,000 m.a.s.l. to 3,000 m.a.s.l, which account for close to 40% of the Study Area in terms of surface area, warm climate dominates throughout the year with a mean temperature in the range of 10 degrees and 20 degrees and an annual difference in temperature is smaller but a daily one is larger.

The rainfall and isotherm map as well as mean monthly precipitation and mean monthly temperature map of some typical areas in the provinces of Azuay and Cañar are given in the next page.



Source: Elaborated by the Study Team with GIS based on data from the Ministry of the Environment (2003)

In this area rainfall pattern is clearly different from typical low latitude region with less rainfall intensity and with longer duration of misty rain and smaller raindrop. Owing to this rainfall pattern lands within the area are less vulnerable to soil erosion and, due to this phenomenon, it is considered that farmlands in the southern Sierra region have been sustainably used up to date. Nevertheless, in par with modernization of farming activity, degradation of soils (loss of organic materials) is commonly observed and loss of soils attributable to hydraulic erosion is taken place in some farmlands in Southern part of Azuay and Eastern part of Azuay and Cañar provinces.

A variety of fauna and flora, which are adapted to the typical conditions of this region such as low temperature, severe wind, relatively high humidity, cloudy weather, different hours of sunlight by sub-region, temperature with larger daily difference, etc., are found; tropical fauna and flora are distributed in lower sector, endemic species called as “Chaparro” are distributed in the sector with altitude in the range of 2,000 m.a.s.l and 3,500 m.a.s.l. and high plateau grassland (Paramo) are scattered over the sector higher than 3,500 m.a.s.l.. The bio-diversity is thus considered to be high. It is reported that nearly 2% of the species become extinct year after year as a consequence of expansion of farmlands and other factors. On the other hand, deforestation is accelerated in the area; forest area was decreased by almost 30% (about 440 km²) during 10 years: 1991 – 2000 in the basin of the Paute River, the most important river basin in Azuay Province. The progress of deforestation is more conspicuous in this area than other Latin American countries, exceeding an average decrease in forest area in Latin American countries (2.8%/year). It is thus worried about that this accelerated deforestation leads to degradation of land resources and impairs sustainability of fauna and flora.

The Ministry of Environment undertook legislation on environmental conservation, with identification of environment protection zones and natural protection parks, where deforestation and over-hunting of fauna is forbidden. Within the Study Area these protection zones amount to 332 thousand ha in total, 256 thousand ha in Azuay Province and 76 thousand ha in Cañar Province.

Environment protection zones are as illustrated below.

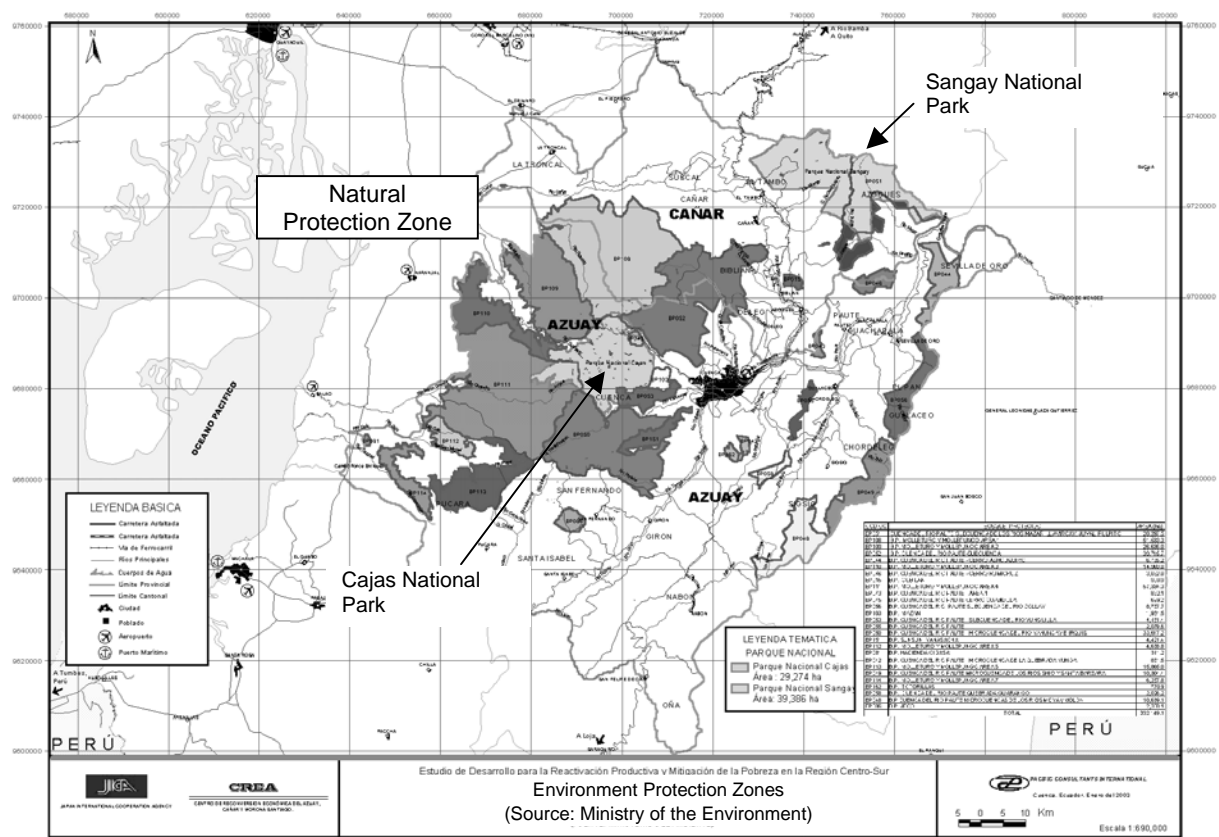


Figure: Natural Protection Zone Map

3.1.4 Socio-economic Condition

(1) Demography

A distinctive demographic feature in the Study Area is that the proportion of female population is higher than the national average; against 50.5% of the national average, the said proportion is elevated to 51.7% in the Sierra Region and is further ascended in the Study area with 53.3% in Azuay Province and 54.1% in Cañar Province. On the other hand, female population prevails in urban sector throughout the country, meanwhile male population outstrips female population in rural area. With regard to the Sierra Region, although female population excel male population in both urban and rural sectors, no distinctive difference is found between populations of both sexes. Finally, female population is more elevated in rural area of Azuay and Cañar provinces in comparison with that in urban area.

Table: Demographic Feature in the Study Area

	Total Population			Urban Population			Rural Population		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Ecuador	12,156,608	6,018,353	6,138,255	7,431,355	3,625,962	3,805,393	4,725,253	2,392,391	2,332,862
		49.5%	50.5%		48.8%	51.2%		50.6%	49.4%
Sierra Region	5,460,738	2,640,020	2,820,718	3,013,139	1,447,548	1,565,591	2,447,599	1,192,472	1,255,127
		48.3%	51.7%		48.1%	51.9%		48.7%	51.3%
Azuay Province	599,546	279,792	319,754	312,594	147,041	165,553	286,952	132,751	154,201
		46.7%	53.3%		47.0%	53.0%		46.3%	53.7%
Cañar Province	206,981	95,010	111,971	75,601	35,572	40,029	131,380	59,438	71,942
		45.9%	54.1%		47.1%	52.9%		45.2%	54.8%

Source: SIISE3.5 (2001)

(2) Land Tenure

Land owners with farm size less than 5 ha represent 86.5% of the total land owners in the Study Area, which intimates that the majority of farmers in the area are composed of small and marginal farmers. Actual situation of land tenure is as given in the table below.

Table: Land Tenure in the Study Area

Land Size Range	Proportion of Land Owners (%) ^{1/}			Proportion of Farm Size per Farmer (%) ^{2/}			Average Farm Size (ha)
	Azuay	Cañar	Total	Azuay	Cañar	Total	
0.0 ~ 1.0	46.1%	48.1%	47.0%	4.3%	3.1%	3.8%	0.4
1.0 ~ 5.0	41.2%	35.4%	39.5%	18.4%	10.9%	15.6%	2.1
5.0 ~ 10.0	6.6%	7.9%	7.0%	9.3%	7.5%	8.6%	6.6
10.0 ~ 20.0	3.1%	3.3%	3.2%	8.4%	6.4%	7.6%	13.0
20.0 ~ 50.0	1.9%	2.5%	2.1%	11.7%	10.9%	11.4%	29.5
More than 50.0ha	1.1%	1.7%	1.3%	48.0%	61.3%	52.9%	221.6
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	5.4

Remarks 1/- Proportion of land owner having land corresponding to land size range

2/- Proportion of accumulated

Source: III Censo Nacional Agropecuario

(3) Income Level

The total Regional GDP in the Study Area amounts to US\$ 131,807 thousand, divided into US\$ 99,633 in Azuay Province and US\$ 32,174 thousand in Cañar Province. The amount stemmed from non-agricultural sector represented by commercial activity in the City of Cuenca and other urban area and remittance made by local people working outside the region outstrips that of agricultural and livestock sectors in both provinces.

Table: Regional GDP by Sector in Azuay and Cañar Provinces

	Total Regional GDP (US\$ x1,000,000)			Proportion		
	Azuay	Cañar	Total	Azuay	Cañar	Average
Agriculture	44.318	15.437	59.755	44.5%	48.0%	45.3%
Non-agriculture	55.315	16.737	72.052	55.5%	52.0%	54.7%
Total	99.633	32.174	131.807	100.0%	100.0%	100.0%

Source: III Censo Nacional Agropecuario.

Due to deficient job opportunities, upsurge of living cost as a consequence of introduction of dollarization policy, decrease in farm income attributable to declined competitiveness of agro-products, etc., farmers are compelled to practice the austerities. So as to get rid of these difficulties, more local population is likely to leave where they live and an exodus of the core labor force of farmers bound for foreign countries seeking for more attractive wages becomes a common phenomenon in the region. This phenomenon, on the other hand, is advantageous in terms of improvement of living standard of remaining family members relying on remittance by migrant worker as well as of acquisition of foreign exchange for the national economy. In sum, it is not doubtful that increasing number of migrant workers staying abroad turns out to be effective for the national economy of Ecuador. According to the Central Bank of Ecuador, of total overseas remittance by Ecuadorian migrant workers staying abroad amounting to US\$ 1,205 million in 2000, 46%, equivalent to US\$ 551 million, had been made to Azuay Province and 3%, equivalent to US\$ 36 million, to Cañar Province. It is reported that these remittances were not invested in farming activity but were spent for commercial (supermarkets and department stores), education, health and sanitation, hotels, foods and drink.

(4) Local Organization

Rural organizations relevant to irrigation, crop production, agro-industry, etc. are formed within communities. These organizations are acting as legally established organizations, being registered with public agencies anticipating their supports in financing and other aspects. Features of rural organizations represented by local inhabitants are as described below.

Table: Features of Existing Organizations

Rural Organizations	Features
Community (<i>Comuna</i>)	<ul style="list-style-type: none"> To be required more than 50 members for legal registration. Has the authority to implement social infrastructure (environmental sanitation, electricity, water supply, telephone, roads, etc.)
Association (<i>Asociación</i>)	<ul style="list-style-type: none"> To be required more than 11 members for legal registration. Organized by persons engaging in productive activities.
Cooperative (<i>Cooperativa</i>)	<ul style="list-style-type: none"> To be required more than 11 members for legal registration. Organization for productive activities.
Water Users' Association, Board of Directors for Irrigation Canals (<i>Junta General de Usuarios Dirección de Aguas de Canales de Riego</i>)	<ul style="list-style-type: none"> Operation and maintenance of irrigation system, authority to distribute irrigation water, etc.

Source: Elaborated by the Study Team based on a General Study

Rural organization is composed of communities with a parent of the “*Minga*” practice which is an ancestral habit dated from pre-Inca times, helping to share the work among friends, relatives and neighbors, and it also possesses a deeper meaning by working with a high degree of solidarity among the members.

With a progress of depopulation due to accelerated phenomenon of exodus of local people for working abroad, the *Minga*-related activity has been changed as joint-working group for development of social infrastructure and this activity together its participation has been lowered. Conventional productive *Minga*-related activity is conserved in such areas as payment of wages and interdependency of farm labor.

Minga

Minga, which is an ancestral habit dated from pre-Inca times among indigenous people, is a gratuitous form of labor supply and services within regional communities. Its activities are represented by labor supply in cooperative manner for public works and farming and had been developed in and around Andean Region.

After the fall of the Incaic Empire and under jurisdiction of the Spanish Invader, indigenous people had been forced to work at ranches and Minga-related activities had been declined. Coming to an end of colonized period and subsequent implementation of agrarian reform program, indigenous people had been distributed farmland, which led to organize communities at village and settlement level. Under the circumstances, traditional Minga-related activities have been revitalized with active participation in such public works within the communities as road, irrigation canal, electric supply, water supply, etc. On the other hand, mutual labor supply system for farm work is called "Cambiamanos".

And, it should be pointed out that keen participation of local people in Minga-related activities is promoted and fostered by laying down of penal regulations, should a family belonging to communities fail to supply designated number of labor force for Minga-related activities.

(5) Other Social Characteristics

Other social characteristics of the two provinces in question were analyzed with reference made to such indicators as illiteracy rate, school enrollment rate, birthrate, mortality rate at birth and participation rate to medical services.

The illiterate rate is elevated as a canton is located far from the urban area of each province and school enrollment rate, birthrate, mortality rate at birth and participation rate becomes higher as a canton is located nearer to the central area of each province. In particular, with regard to the participation rate to medical services, cantons located at central part of each province are featured by distinctively higher rate. Meanwhile, cantons located in rural area suffer from higher birthrate and mortality rate at birth, reflecting inadequate sanitation and medical circumstances in rural area.

Table: Other Social Characteristics of the Two Provinces

Provinces	Cantons	Illiteracy Rate	School Enrollment Rate	Participation rate to Medical Services
Azuay	Cuenca	11.04	6.90	47.77
	Girón	17.47	3.53	2.30
	Gualaceo	22.21	3.53	6.49
	Nabón	33.34	2.49	4.33
	Paute	25.00	3.12	5.85
	Pucará	19.32	3.95	4.56
	San Fernando	13.27	4.39	8.17
	Santa Isabel	15.00	4.28	9.77
	Sigsig	20.52	3.34	4.45
	Oña	30.84	2.72	5.34
	Chordeleg	21.13	3.44	2.89
	El Pan	17.12	3.83	1.73
	Sevilla de Oro	12.34	4.77	15.27
Guachapala	24.06	3.48	18.32	
Cañar	Azoguez	76.22	5.10	17.72
	Biblian	74.05	3.59	5.21
	Cañar	84.67	3.47	8.43
	La Troncal	85.93	4.59	3.85
	El Tambo	80.89	3.85	3.15
	Déleg	69.90	2.97	3.57
	Suscal	84.79	2.31	2.92

Source : SIISE3.5

3.2 Industrial Sector

3.2.1 Agriculture and Livestock

(1) Land Use

The Study Area is located within a wide range of land elevation ranging from 50 m.a.s.l. to 4,500 m.a.s.l. and thus has a physical potential for cultivation of diversified cereals, vegetables, fruits, beans, root vegetables, flowers, medical plants, pastures and trees/shrubs. Actual land use of the Study Area is as given in the table below; 23.8% of the total land are used for crop cultivation, 22.9% for pasture and 10.2% for forests. On the other hand, land elevation ranging from 3,000 m.a.s.l. to 3,500 m.a.s.l. or about 41.9% of the total land is occupied by high plateau pasture and since soil conditions and climate are unfavorable for agricultural activity, its actual land use as productive land is quite difficult.

Table: Actual Land Use

Land Use	Area (ha)			Proportion (%)		
	Azuay	Cañar	Total	Azuay	Cañar	Total
Banana	570	4,727	5,297	0.1	1.5	0.5
Coffee	0	3,614	3,614	0.0	1.1	0.3
Orchard	6,601	43	6,644	0.8	0.0	0.6
Cacao	4,863	276	5,139	0.6	0.1	0.5
Sugarcane	5,633	19,954	25,586	0.7	6.3	2.3
Associated crops	79,275	19,369	98,644	9.9	6.1	8.8
Corn	88,521	32,005	120,526	11.0	10.1	10.8
Rice	0	33	33	0.0	0.0	0.0
TOTAL CROPS	185,463	80,021	265,483	23.1	25.2	23.8
Pasture	187,570	68,428	255,998	23.4	21.7	22.9
TOTAL AGRICULTURAL LAND	373,033	148,499	521,481	46.5	46.9	46.7
NOT DEFINED	6,328	0	6,328	0.8	0.0	0.6
Barren and vegetation growth	8,811	9,093	17,904	1.1	2.9	1.6
Tree formations	82,809	31,533	114,342	10.3	10.0	10.2
Moor herbaceous vegetation	331,076	126,446	457,522	41.3	40.1	40.9
TOTAL UNUSED LAND	429,024	167,072	596,096	53.5	53.1	53.3
TOTAL	802,057	315,523	1,117,579	100.0	100.0	100.0

Source: Ministry of Environment

(2) Employees in the Agricultural and Livestock Sector

43.7% of the employees in the agriculture and livestock sector are represented by female employees and the proportion of female laborers excels that of male employees in four cantons: Cuenca, Sigsig, Bibbian and Déleg. The number of the employees in the agriculture and livestock sector occupies 16.34% of the total population in the two provinces. The distribution of the employees in the agriculture and livestock sector by sex, province and sub-sector is as given in the table below.

Table: Distribution of Employees by Sex, Province and Sub-sector

	Number			Share to Total Population (%)		
	Azuay	Cañar	Total	Azuay	Cañar	Total
Population	599,546	206,981	806,527	—	—	—
Farm Laborers	99,633	32,174	131,807	16.62	15.54	16.34
Male	55,038	19,208	74,246	55.2	59.7	56.3
Female	44,595	12,966	57,561	44.8	40.3	43.7
Agriculture	44,318	15,437	59,755	44.5	48.0	45.3
Livestock	55,315	16,737	72,052	55.5	52.0	54.7

Source: III Censo Nacional Agropecuario

(3) Agriculture and Livestock

The percentage of arable land with slope exceeding 20% that is not suitable for farm work and is at the same time vulnerable to land erosion accounts for 43.7% of the total area for arable land. On the other hand, lands with steep slope may be used as grazing land. Furthermore, lands with slope exceeding 10% that is not suitable for mechanized farming represent 53.2% of the total area for arable land and 58.2% for pasture.

Table: Distribution of Arable Land and Pasture by Slope (%)

Land Use/Inclination	0~3 %	3~10%	10~20%	20~30%	>30%	Total
<u>Arable land</u>						
- Azuay	38.0	3.6	9.9	12.1	36.4	100.0
- Cañar	57.3	1.6	8.5	9.7	22.9	100.0
- Total of Study Area	43.8	3.0	9.5	11.4	32.3	100.0
<u>Pasture</u>						
- Azuay	38.9	2.2	11.2	15.4	32.2	100.0
- Cañar	40.6	2.8	6.4	15.4	34.6	100.0
- Total of Study Area	39.3	2.3	10.0	15.4	32.8	100.0

Source: Ministry of Environment

a. Crop production

An output of crops is increasing in parallel with expansion of cultivated area. Nevertheless, productivity of crops is depressed in most of crops in comparison with other regions, attributable to lack of financial resources required for procurement of inputs, dependence on rain-fed tillage, conventional cropping practice, deficient input of fertilizers, inadequate cropping technology and so on. Thus, improvement and upgrading of cropping technology is a pressing agenda in farming activity of the area.

Cultivated area, output and unit yield of crops by province are as shown below.

Table: Cultivated Area, Output and Unit Yield of Crops in Azuay Province

	Cultivated Area (ha)		Output (t)		Unit Yield (t/ha)	
	1990	1992	1990	1992	1990	1992
Dry Soft Corn (Grain)	37.24	48.73	23.188.880	30.415.420	650	650
Dry Kidney Bean (Grain)	10.8	10.35	2.820.940	2.416.900	330	320
Dry Faba Bean (Grain)	8.8	170	383.39	61.31	480	490
Cacao (Dry Almond)	6.16	6.66	947.7	650.38	160	100
Potato (Fresh tuber)	1.04	2.34	2.486.330	6.608.240	2.4	2.92
Sugarcane (Flesh stem)	6.57	5.44				
Yong Faba Bean (Pod)	210		498.1	118.8	2.51	2.33
Yong Kidney Bean (Pod)	1.15	510	1.336.920	827.62	1.31	1.7
Banana (Fresh Fruit)	1.8	2.34	10.531.120	9.390.300	6.44	5.12
ZAMBO						
Soft Corn Choclo (Cob)	2.37	2.23	3.478.720	4.529.950	1.48	2.07
Hard Dry Corn (Grain)	4.02	4.1	4.013.380	4.126.840	1.01	1.01
Young Pea (Pod)	890	810	498.1	118.8	2.51	2.33
Wheat (Grain)	1.24	1.98	375.34	527.74	310	270
Barley (Grain)	1.34	1.21	745.44	517.93	550	450
Pea (Grain)	300	710	60.84	143.88	200	240
Tree Tomato						
Oat						

Source: III Censo Nacional Agropecuario

Table: Cultivated Area, Output and Unit Yield of Crops in Cañar Province

	Cultivated Area (ha)		Output (t)		Unit Yield (t/ha)	
	1990	1992	1990	1992	1990	1992
Sugarcane (Flesh stem)	9.39	9.4	597.758.550	617.400.000	63.69	70
Dry Soft Corn (Grain)	9.15	1.25	5.020.730	3.125.830	560	
Dry Kidney Bean (Grain)	4.07		1.623.920	298.84	500	
Banana (Flesh Fruit)	5.07	7.65	93.540.720	116.762.320	18.98	19.47
Cacao (Almond)	3.81	3.32	925.55	781.25	250	260
Faba Bean (Grain)	450	970	299.94	444.92	540	450
Potato (Flesh Tuber)	2.79		11.368.460	51.05	4.19	3.5
Rice (With husk)	2.33	2.34	6.256.610	8.540.390	2.68	3.65
Barley (Grain)	2.81	2.96	2.317.300	1.938.300	660	660
Wheat (Grain)	1.3		1.040.090		850	
Multi-purpose Sugarcane (Stem)	3.39	4.1				
Hard Dry Corn (Grain)	1.72		3.948.370		1.45	
Young Faba Bean (Pod)	170	270	516.47	133.55	3.63	720
Soft Corn Choclo (Cob)	1.06	3.14	1.969.200	3.571.950	1.87	1.19

Young Pea (Pod)	1.08	1.36	1.247.490	1.495.100	1.19	1.11
Kidney Bean (Pod)	170	3.96	267.33	1.466.640	1.65	400
Coffee (Golden Grain)	890	760	219.09	212.78	270	310
Young Pea (Grain)	1.08	640	346.35	102.46	330	200

Source: III Censo Nacional Agropecuario

b. Livestock

Dairy production is the leading livestock activity. In general, small and marginal livestock farmers keep 3 – 6 heads of dairy cattle and set bulls produced through natural breeding for farm labor and for beef production. Species bred in the area are represented by conventional ones called as “Criollo” and hybrid species for dairy and beef cattle account for as small portion as only 1.2%. Although it is reported that an average milking capacity of Criollo cattle is 12 liters/day/head, the productivity in the area remains such depressed level as 3 liter/day/head. So as to raise productivity of dairy cattle, it is essential to introduce improved pasture, to renovate feeding system of conventional pasture with introduction of silo, to introduce more appropriate breeding technology and to employ more appropriate management practice for animal sanitation.

Feature of cattle farming in the Study Area is summarized in the following table.

Table: Raised Cattle by Canton and by Purpose

Canton/Parroquia	For Beef (Hybrid)	Dairy Cattle (Hybrid)	For Dual Purpose			Total	Milk Production Liter/day
			Hybrid	Criollo	Cross-bred		
Total Azuay	1,921	2,194	613	297,317	39,572	341,617	79,640
Cuenca	861	1,357	430	108,459	22,017	133,124	31,045
Girón	—	29	—	17,543	1,145	18,717	5,448
Gualaceo	—	14	—	20,339	506	20,859	4,931
Nabón	10	517	—	20,699	1,222	22,448	4,608
Paute	—	157	20	15,403	1,531	17,111	3,165
Pucará	761	—	136	22,628	5,381	28,906	5,016
San Fernando	—	52	—	8,894	1,634	10,580	3,722
Santa Isabel	289	—	—	26,827	3,591	30,707	7,068
Sigsig	—	—	—	34,643	1,307	35,950	8,970
Oña	—	—	—	3,455	—	3,455	528
Chordeleg	—	—	—	5,736	—	5,736	1,716
El Pan	—	68	27	3,620	105	3,820	920
Sevilla de Oro	—	—	—	6,039	582	6,621	1,659
Guachapala	—	—	—	3,032	551	3,583	842
	—	1,179	74	109,785	28,714	139,752	173,767
Azoguez	—	38	—	24,610	1,770	26,418	27,134
Biblian	—	928	74	14,493	5,018	20,513	45,832
Cañar	—	12	—	54,099	18,010	72,121	82,903
La Troncal	—	—	—	881	2,008	2,889	1,450
El Tambo	—	166	—	4,338	734	5,238	8,134
Déleg	—	—	—	7,935	980	8,915	5,676
Suscal	—	35	—	3,429	194	3,658	2,639

Source: III Censo Nacional Agropecuario

c. Marketing of agro-products

Marketing infrastructure within the Study Area is under-developed, so agro-products of small and marginal farmers are sold individually at the nearest small-scaled local markets. Only limited farmers make use of marketing channel to major cities of the country, meanwhile the reminder depends on middlemen for marketing of their agro-products. The similar situation is observed with regard to marketing of dairy products; small and marginal cattle farmers are forwarding milk without proper quality control.

Existing marketing network of the agro-products in the Study Area mainly consists of the following two channels, namely: (1) To be transported to processing and manufacturing plants through

middlemen and to be sold processed and manufactured products to consumers by retailers and (2) To be purchased directly by processing agents and to be sold processed products to consumers by retailers. Apart from these two channels, very small portion of agro-products are marketed through the following channels: (3) To be transported to processing and manufacturing plants through cooperatives specialized in collection and forwarding of agro-products and to be sold processed and manufactured products to consumers by retailers, (4) To be transported directly to grocers by cooperatives specialized in collection and forwarding of agro-products, and (5) To be sold directly to consumers by cooperatives specialized in collection and forwarding of agro-products. The latter three channels are established in the limited area (only a couple of examples) where consistent agricultural and dairy products is attained and cooperatives specialized in collection and forwarding of agro-products are organized owing to supports of public agencies.

The said marketing channels together with proposed marketing channels in the future are illustrated below.

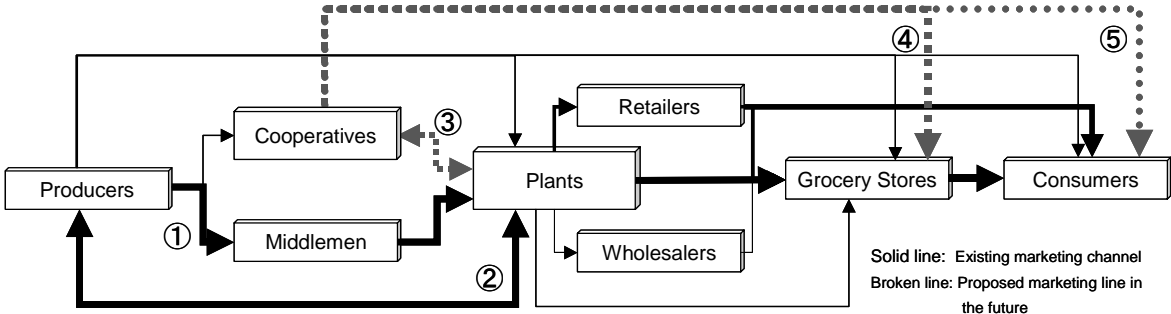


Figure: Marketing of Agro-products

In the case of channel (1) above, small and marginal cattle farmers who are not in a position to be accessible to relevant market information tend to be prejudiced by depressed farm-gate prices offered by middlemen. Meanwhile, in the case of channel (2), benefited farmers are those who can comply with rigid request of processing and marketing agents with a consistent production and quality control and, at the same time, are stationed in areas easily accessible to this channel.

3.2.2 Non-Agricultural Income

The industries other than agriculture such as commerce, hotels, restaurants and handicrafts, which are considered to be unconventional industries for the Study Area, have considerable impact on regional economy. In the province of Azuay, the agriculture sector, the leading industry, keeps a balance with non-agricultural industries in terms of economic impact. In the province of Cañar, on the other hand, the agricultural sector remains the leading industry and contributes considerably to creation of job opportunities. Handicrafts manufacturing is actively conducted at community level of rural area, contributing greatly to income formation of local people. In relation with tourism, it is evaluated that the area has high potential for being blessed with relevant resources like: Caja and Sanga National Parks, Inca Ruins (Ingapirca, Sigsig and Cuenca), etc. For development of tourism, it is indispensable to encourage public relations and promotion of publicity, development of traffic infrastructure and local industry represented by handicraft manufacturing, and to implement an integrated development of these inter-related industries.

Table: Distribution of Major Industries

Sectors	Azuay Province	Cañar Province
Agriculture, Hunting and Fishery	23.1	45.3
Mining and Quarrying	1.0	0.1
Handcraft	18.1	10.0
Electricity, Gas and Water Supply	0.4	0.2
Construction	8.0	8.3
Commerce, Hotels and Restaurants	18.4	10.7
Transport and Communications	4.7	4.7
Finance	2.7	1.1
Welfare and Social Services	16.5	13.9
Others	7.0	5.6

Source: SIISE 3.5 (2001)

3.3 Gender and Poverty

3.3.1 Gender

(1) Domestic Position of Women within Household

The provinces of Azuay and Cañar have been regarded as the provinces with the highest rate of depopulation in Ecuador caused by an exodus of adults as migrant workers since about 30 years ago, and with higher proportion of female head of household because their husbands have been emigrated to other cities or have been abandoned their family member after getting job as migrant workers. Under the situation more women tend to participate in development of communities or cantons; in particular, at the cantons with higher proportion of men leaving as migrant workers, women are willing to be employed or to engage in small-scaled agricultural work for attaining income to sustain their family members. In the case of families without male head of household leaving for working abroad as migrant workers, remaining wives are forced to sustain economically their family in addition to being engaged in routine activities, until their husbands shall get job abroad to attain enough and consistent income and shall have been paid off totally their debts borrowed for leaving abroad in seek of job opportunity. The frequency of engagement in productive activity by children become higher year after year; these children are expected to take care of cattle while their mothers are engaging in farm labor. Meanwhile, even though at the cantons with relatively lower rate of exodus of male population as migrant workers, activity of women in rural area is diversified from looking after children to engaging in farm labor and their work load is significantly heavy.

(2) Proportion of Female Employees

The unemployment rate of the economically active population older than 12 years in Cuenca, capital of the Azuay Province, was 5.4% for men and 6.9% for women in 1988, but the same for women was elevated to 7.2% in 1996. According to the information on general labor market in the province of Azuay in 2001, the percentage of women having jobs was 53.1% of the women' economically active population older than 12 year and the remaining 46.9% were jobless or in seek of job opportunities. In spite of an increase in total female population in 2001, the said percentage was lowered than that in 1990 which accounted for 55.9%, and similar incident is taken place in the province of Cañar. In sum, less people were employed within the province in comparison with previous years. Finally, it should be indicated that the information cited before does not include household labor without remuneration.

Table: Participation of Labor Market Among Economically Active Population in 2001

Sector	Province of Azuay			Province of Cañar		
	Total	Women	%	Total	Women	%
Urban Area	237,484	124,961	52.6	56,318	26,062	46.3
Rural Area	197,771	106,134	53.7	90,057	45,457	50.5
Total	435,255	231,095	53.1	145,375	71,519	49.1

Source : SIISE3.5 (2001)

Table: Participation of Labor Market Among Economically Active Population in 1990

Sector	Province of Azuay			Province of Cañar		
	Total	Women	%	Total	Women	%
Urban Area	166,894	88,430	53.0	49,114	23,767	48.4
Rural Area	177,751	104,258	58.7	75,592	41,401	54.8
Total	344,645	192,688	55.9	124,706	65,168	52.3

Source : SIISE3.5 (2001)

(3) Female Organizations

Female organizations in the Study Area consist of association, cooperative, group activities, etc. and the activities of these organizations are represented by handicraft manufacturing like knitting, Panama hats, embroideries, potteries and so on, as well as by fostering women to engage in crop production, raising of small animals and development of forest resources. Although being under-developed administratively, the said organizations play an important role in routine life of rural women.

Up to recent year, an agricultural development had been conducted targeting group and supporting programs for agricultural development, rural finance and agricultural technical had been put into implementation comprising male group as their beneficiaries. As a consequence, the female group had been left behind the development process, under-evaluating their contribution to productive activities. It is observed, nevertheless, that the proportion of participants represented by the female group in such legal rural organizations as rural community, water users' association and various committees has increased nowadays, with an aggressive participation in organizations closely related with basic services and productive activities. However, the role of women still remains an insignificant level like nothing but participation, without being nominated as leaders of organizations or persons in charge of administration and management of organizations.

Public and private organizations in which women take part in somehow are as listed below.

- Azuay Women's Association – AMA
- Aurora Social Development Center
- Azuay Education and Training Center for Rural People – CECCA
- Ecuadorian Cooperative Committee with the Inter-american Women's Commission – CECIM
- Canton-based Coordinator for Women in Azogues – COCMA
- National Institute for Children and Family, Azuay Branch – INNFA, Training Program for Women
- Ministry of Agriculture and Livestock – Agriculture and Livestock Bureau in Azuay – Rural Development Department
- Arquidiócesis Cuenca Social Pastral
- Azuay Rural People Union (UNASAY)
- Azuay Women's Network

(4) Women's Participation in Rural Activities

The study carried out at the communities disclosed that an access and control by household are not biased neither to men nor to women and that the decision right within household remains in parallel between ambos sexes. Almost all family members participate in raising of livestock, but milking is undertaken with more dependence on women. So as to conduct sanitary control and to attain consistent output of milk, it is indispensable to carry out milking early in the morning every day and women's work load is considered to be heavy accordingly. The participation rate of men at important meetings is higher than that of women, but an opposite result is observed in case of routine meetings. *Minga* (Group work at community level) and *Cambiamanos* (Interdependency of farm labor among farmers) are of the same kind of cooperative working system, but the participation rate by sex is diversified by canton. The table below shows participation degree by sex for various kinds of rural activities.

Table Participation Degree in Rural Activities by Sex (Evaluated in 10 Degrees)

Canton	Sex	Important Meeting of Organization	Routine Meeting of Organization	<i>Cambia manos</i>	<i>MINGA</i>	School Activities	Religious Activities	Activities at Communities
Sigsig	M	4	6	1	6	1	3	3
	F	5	8	0	7	1	5	4
Suscal	M	5	8	2	5	2	4	3
	F	6	8		7	1	5	2
Cachi	M	9	9	2	8	2	5	5
	F	1	8	2	1	3	2	0
Bulan	M	7	6	0	6		4	7
	F	3	5	0	5	3	4	2
San Gerard	M	8	8	0	5	3	9	5
	F	4	5	0	4	1	8	0
Total	M	33	37	5	30	8	25	23
	F	19	34	2	24	9	24	8

Source: Socio-economic Survey by the Study Team (2003)

3.3.2 Poverty Analysis

(1) Historical Background of Poverty

The poverty in the Sierra Belt Region is closely related with disadvantageous farming practice at limited and steep farmlands as well with depressed income level due to lack of alternatives for job opportunities other than agriculture-related activities. In addition, this depressed income level prevents local population from enjoying adequate standard of education and hygienic life, which, in turn, worsen productivity of farming activities, bringing about a vicious circle of poverty. This situation is especially the case at remote rural areas where more economically active people leave their places for urban area and overseas to settle there or to work there as migrant workers, in seek of more cash income. The prevailing feature of poverty in the region is explained in the following manner:

Table: Degree and Scope of Poverty

<p>Low productivity of agriculture and livestock farming</p> <p>↓</p> <p>Decline in regional economy due to increase of migrant worker</p> <p>↓</p> <p>Serious vicious circle of poverty</p>	<p>Most of the farmers have small and marginal size of land (less than 5ha), engaging in farming practice at lands with steeper slope.</p>
	<p>Therefore, the productivity was extremely low and their activity was mainly limited to self-sufficient-oriented production. They hardly had surplus production for sale at markets.</p>
	<p>Living costs had been soared due to the dollarization of the national currency, even though drop in price of agricultural products caused by liberalization and modernization measures taken by the government. Under the situation, local people could afford nothing but foodstuff and education and had no margin to expend other necessities. This was especially the case among small and marginal farmers engaging farm labor at lands with steep slope.</p>
	<p>Many workers emigrated from Ecuador to Western countries to settle illegally because Ecuadorian people could go abroad without difficulty. Consequently, the agriculture and livestock farming sector had lost trunk labor force in the rural areas and more farmers had lost their farmlands to pay off their debts borrowed for traveling abroad in seek of job opportunities. This was especially the case among small and marginal farmers engaging farm labor at lands with steep slope.</p>
	<p>Regional economy was gradually declined due to devastated process of farmlands together with depopulation of inhabitants in rural sector.</p>
	<p>Under limited budgetary allocation of the central government, the agriculture and livestock was severely influenced to result in decline of the regional agricultural and livestock production as a whole.</p>
	<p>Therefore, most of the farmers were forced to engage in less profitable agricultural and livestock production throughout the region.</p>
	<p>The said situation, in turn, leads to further lowering of agricultural productivity and accelerated deterioration of regional economy. As a result, poverty became more prevalent among local people and finally vicious circle of poverty became conspicuous.</p>
	<p>The vicious circle of poverty mentioned before is not a peculiar phenomenon in remote rural area but has expanded gradually to flat land area, and has become common throughout the Sierra Belt Region.</p>

The poverty situation in the provinces of Azuay and Cañar in comparison with other provinces is as described in Chapter 2 and historical background of poverty in the provinces in question is analyzed hereinafter.

Small-scaled farmers prevail in the provinces of Azuay and Cañar and the majority of these farmers are marginal farmers to have been granted land as a consequence of agrarian reform program. Agricultural productivity of these farmers is depressed depending on inadequate farming practice under limited size of farmland. Because agricultural production of these farmers is limited mainly for subsistence of family members, thus in-house handicraft represented by production of Panama hat has been in fashion among these farmers so as to sustain their families. Income stemmed from this activity farmers remain extremely depressed, due to exploitation of profit by middlemen or export agencies.

Historically, the Eastern mountain zone of Azuay Province and Cañar Province has been characterized as a province with higher proportion of indigenous people. Until the implementation of agrarian reform program in the 80s, greater part of the lands in the province were held by large land owners managing large-scaled plantations and ranches or by Christian churches. The indigenous people lived around these large-scaled plantations and ranches were employed in an extremely unfavorable condition. Moreover, there existed a conventional farm labor practice called “*Huasipungo*” in which farm laborers were employed with a grant of tiny and inadequate land not suitable for sustaining their family; still worth is that these laborers were forced to work at plantations or ranches of landowners without being paid remuneration. This feudalistic practice had been changed in the 70s and the above-mentioned “*Huasipungo*” was put to an end with implementation of agrarian reform program. After that, farmers were granted lands, but their living standards were not enhanced but were worsened because the said agrarian reform program was carried out without comprising institutional supporting services for agricultural development, empowerment and capacity building of beneficiaries and rural finance services.

The agricultural sector is likely to be oppressed in recent years under the progress of globalization and free trade program. In the light of such situation, competitiveness of agro-products of the region produced under inadequate conditions has been declined being inferior to that of the neighboring countries offering goods with lower price, and economic situation of farmers has been impaired further without being secured with enough farm income to sustain their households.

(2) Prevailing Situation of Poverty

Various information relevant to poverty are compiled in the summarized report of the National Population Census 1990 carried out by the Executive Office of the President, which comprises statistics data on population, income, education, public health and hygiene, social infrastructure, etc. The poverty indices, which are the indicators for the poverty analysis, are defined below.

a. Poverty at canton level

Of 22 cantons within the Study Area, the cantons with relatively high poverty indexes are located around the northern and southern borders of the provinces, meanwhile the city of Cuenca and its surrounding cantons are featured by relatively low poverty indexes. This fact intimates that the core of the economy of the Study Area falls on the city of Cuenca, located almost at the center of the Study Area and the cantons with more geographically advantageous location to the city of Cuenca, that is to say, with closer economic linkage with the city of Cuenca, are featured by lower poverty indexes. The cantons of Suscal and El Tambo, which

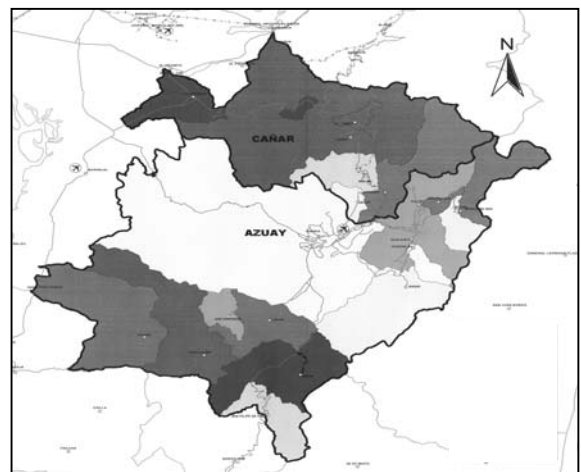


Figure: Poverty at Canton Level

have higher proportion of indigenous people, represent higher poverty indexes and thus call for measures to be taken by relevant government organizations to alleviate such poverty conditions.

Table: Poverty Indexes by Canton

CANTON	Province	Poverty Index	Ranking	Extremely Poverty Index	Ranking
Cenca	Azuay	52.03	1	18.28	1
Chordeleg	Azuay	67.52	2	25.65	4
El Pan	Azuay	69.88	3	19.05	2
Deleg	Cañar	69.90	4	21.48	3
Sigsig	Azuay	71085	5	30.71	7
Biblian	Cañar	74.05	6	31.95	10
Ona	Azuay	74.59	7	30.72	8
San Fernando	Azuay	75.09	8	27.17	5
Guadaceo	Azuay	75.66	9	31.55	9
Paute	Azuay	75.90	10	32.71	11
Pucara	Azuay	75.93	11	40.54	15
Azogues	Cañar	76.22	12	35.36	13
Sevilla de Oro	Azuay	76.72	13	32.93	12
Guachapala	Azuay	78.62	14	29.94	6
Giron	Azuay	80.23	15	38.43	14
El Tambo	Cañar	80.89	16	45.10	18
Santa Isabel	Azuay	81.01	17	43.25	16
Cañar	Cañar	84.67	18	52.10	19
Suscal	Cañar	84.97	19	60.69	21
La Troncal	Cañar	85.93	20	45.04	17
Nabón	Azuay	87.91	21	55.19	20

Source : SHISE3.5 (2001)

b. Poverty analysis at parroquia level

Similar to the analysis at canton level, the parroquia with higher poverty indexes are located around the southern and northern borders of the Study Area. The parroquias located at the central part of canton are generally featured by relatively low poverty indexes and the farther a parroquia is located from the central part of canton, the higher is the poverty index. On the other hand, regarding the cantons having larger surface area like Cuenca, the poverty index varies considerably among parroquias and a comparison on poverty situation among these cantos scarcely makes a sense.

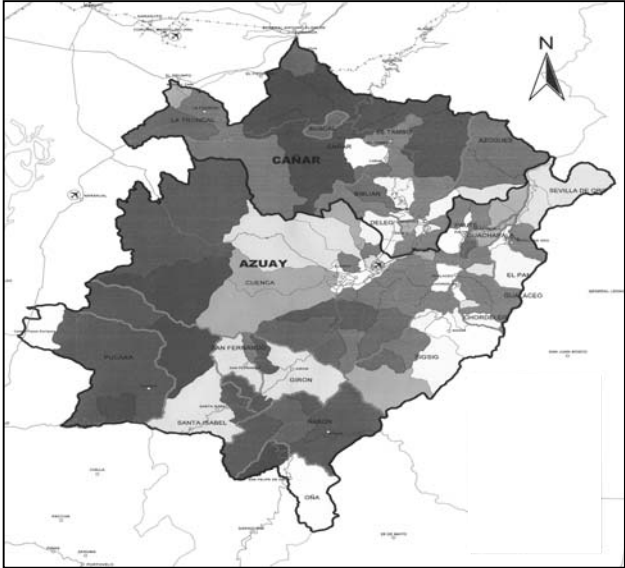


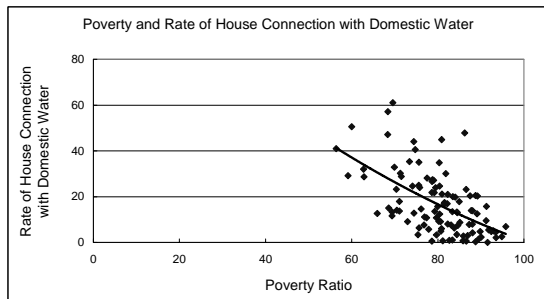
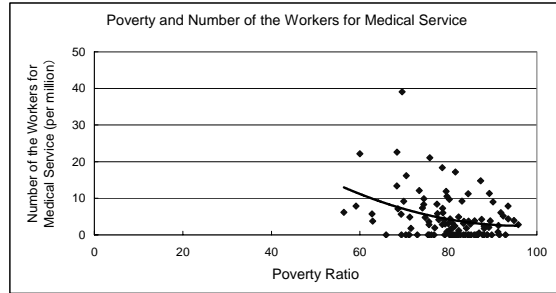
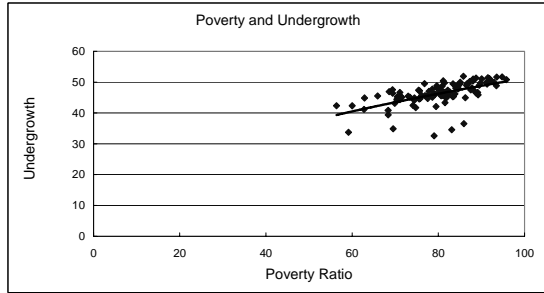
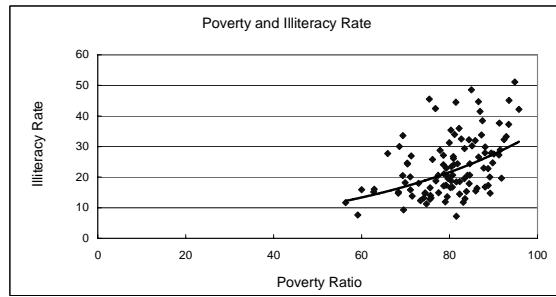
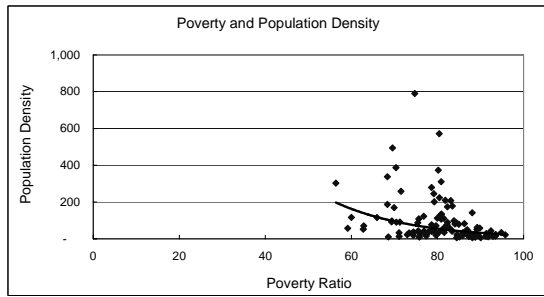
Figure: Poverty at Parroquia Level

The chart to be shown hereinafter indicates the correlation between the poverty indexes and various social indexes of 121 parroquias in the Study Area. Generally speaking, the parroquias with higher poverty indexes are likely to suffer from worsened social conditions. The social indexes which are somehow correlated with the poverty index are: “Illiteracy rate”, “Undergrowth of infants”, “Accessibility to water supply” and “Number of employees in agriculture, livestock and forestry sector”. The correlation of the poverty index with respective social index is as explained hereinafter.

- Population Density:

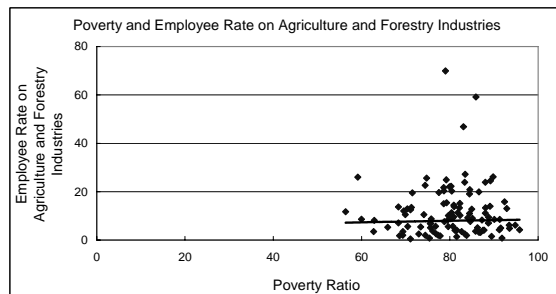
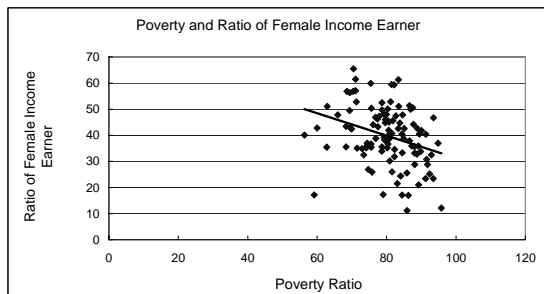
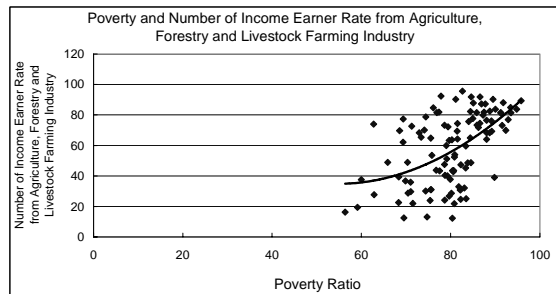
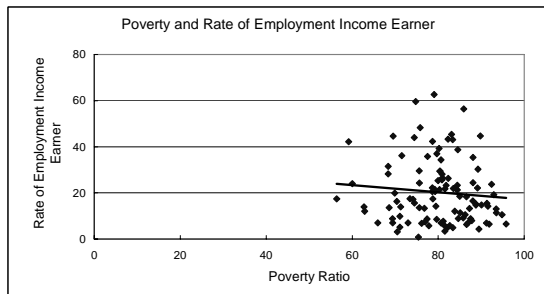
The correlation with the poverty is hardly observed, which suggests that there is almost no disparity in terms of poverty between urban and rural areas except for the central city, Cuenca.

- **Illiteracy Rate:**
No close correlation is observed but it is likely that the parroquias with higher poverty index indicates higher illiteracy rate.
- **Undergrowth of Infancy:**
The undergrowth of the infancy is closely correlated with the status of poverty. This may be explained by the fact that the parroquias with higher poverty index are featured by lower self-sufficiency rate of foods and by deficient resources for procurement of foodstuff.
- **Number of Persons in charge of Public Medical Service:**
No intimate correlation is reported. This indicates that the persons in charge of public medical services as dispatched in impartial manner, although more persons are dispatched to Cuenca and Azogues, central cities of each province so as to render core medical services at province level in these cities.
- **Accessibility to Water Supply by Household:**
A certain degree of correlation is observed. This indicates underdevelopment of water supply system at parroquias in rural sector.
- **Ratio of Salaried Employee:**
No correlation is observed between the salaried employees among economically active population with the poverty index. This intimates indirectly that there is no considerable disparity in terms of income between the salaried employees and farmers in the area.
- **Persons engaging in the Agricultural, Livestock and Forestry Sectors:**
No close correlation is observed but the parroquias with higher proportion of persons engaging in agriculture, livestock and forestry sector tend toward higher poverty index. This indicates that the parroquias without economic sector other than agriculture, livestock and forestry are featured by higher poverty index.
- **Ratio of Female Salaried Employees:**
No correlation is observed. Because double-income family is common throughout the Study Area, female salaried employees play an important role in economic activities of the region.
- **Employees in agriculture, livestock and forestry sector;**
No correlation is observed. This means that income stem from agriculture, livestock and forestry sector has no significant difference with that from other sources, or those who are employed in agriculture, livestock and forestry sector have other sources of income.



Coefficient of determination (square of correlation)

	Population Density	Illiteracy	Under-growth	Workers for Medical Service	House Connection with Domestic Water
Poverty	0.1655	0.2260	0.3183	0.1079	0.3207



Coefficient of determination (square of correlation)

	Employment Income Earner	Income Earner from Agriculture, Forestry and Livestock	Female Income Earner	Employee on Agriculture and Forestry Industries
Poverty	0.0088	0.2987	0.0961	0.0012

Figure: Social Indexes at Parroquia Level

3.4 Farmers in the Study Area

3.4.1 Socio-economic Features of Farmers

A survey on farmers at six (6) target communities of the pilot project was conducted in an attempt of fact finding on socio-economic conditions of farmers. The target communities together with their features and the target persons of the present survey are as given in the table below. The leading industry in the Study Area is agriculture and livestock and the situation of “Depressed income” causing poverty is closely related with declined productivity in this sector. The said socio-economic survey revealed that farmers in these areas are aware that poverty situation is caused by depressed productivity in agriculture and livestock production.

Table: Socio-economic Features of surveyed Area

Target Area	General Features
SIGSIG Canton: GIRON Parroquia: SIGSIG	The parroquia in this district is featured by lower poverty index (Ranked in 101 st out of 121 parroquias) and has less migrant workers in comparison with other parroquias. But the surveyed parroquia is far from the urban area of Sigsig and located on a mountainous slope of land under disadvantageous farming condition. This situation intimated that poverty condition in this parroquia is more serious than the index. The leading industry of the area is agriculture, and vegetables and fruits trees are produced partly under irrigated farming. Average household members: 4.0 persons Average farm size (ha/family): 1.52 ha (Arable land: 0.70 ha and Pasture: 0.82 ha).
SUSCAL Canton: SUSCAL Parroquia: SUSCAL	This parroquia has relatively higher poverty index within the Study Area (Ranked in 30 th out of 121 parroquias). The majority of the population in this parroquia are represented by indigenous people. The leading industry is agriculture and most of the harvests except for potato are for subsistence of farmers’ household. Average household members: 6.2 persons Average farm size (ha/family): 2.33 ha (Arable land: 0.49 ha and Pasture: 1.84 ha).
OÑA Canton: OÑA Parroquia: OÑA	In this area destitute farmers are predominant (Ranked in 9 th out of 121 parroquias). Small-scaled irrigation works are in operation, but they are not efficiently used to conducting advanced farming. Marketing network is under-developed (far from major markers) and technical assistance is hardly rendered. Under the circumstances, traditional and subsistence farming for production of corn and other basic grains prevail. Average household members: 3.5 persons Average farm size (ha/family): - ha (Arable land: - ha and Pasture: - ha).
CACHI Canton: BIBLIAN Parroquia: CACHI	The poverty level in this area is placed almost in the middle within the Study Area (Ranked in 57 th place out of 121 parroquias). The majority of the population in this parroquia are represented by indigenous people. More people leave the area as migrant workers both within the country and abroad. Moreover, not a few male adults go outside the area for working, thus daytime population of male adults is fewer. Average household members: 3.6 persons Average farm size (ha/family): 11.09 ha (Arable land: 0.98 ha and Pasture: 10.11 ha).
BULAN Canton: PAUTE Parroquia: BULAN	The poverty index of this parroquia is placed almost in the middle within the Study Area (Ranked in 47 th out of 121 parroquias). But, socio-economic situation at the surveyed community was presumed to be better than that judged by the statistical data, because farmers there have launched on advanced crops cultivation. Moreover, small-scaled farmers in this area earn more income from agriculture than those in the other areas. Then, less people leave the area seeking employment opportunity outside the area. Average household members: 5.2 persons Average farm size (ha/family): 2.87 ha (Arable land: 0.58 ha and Pasture: 2.30 ha).
SAN GERARDO Canton: GIRON Parroquia: SAN GERARDO	This parroquia is featured by higher poverty index within the Study Area (Ranked in 17 th out of 121 parroquias). But, socio-economic situation at the surveyed community was presumed to be better than that judged by the statistical data, because farmers there have launched on relatively advanced cattle farming. However, it is observed that not a few people leave the area seeking employment opportunity outside the area. Average household members: 5.1 persons Average farm size (ha/family): 6.31 ha (Arable land: 0.66 ha and Pasture: 5.66 ha).

3.4.2 Farm Balance of the Surveyed Area

The survey was conducted targeting 6 communities within the Study Area and the following results relevant to income and expenditure of farmers' household were revealed.

(1) Household Income

Subject to division of income into three categories: agriculture, livestock and non-agricultural sector (Including remittance by migrant workers), income derived from the non-agricultural sector occupied the leading portion with a share of 52.2%, which was the case in the area of Suscal, Sigsig and San Gerardo. Meanwhile, in the areas of Oña and Bulan, the largest source of income is represented by agriculture, despite its share in general remains in 13.8%. And, the share of livestock in general is 34%, but the sector together with non-agricultural sector accounts for the primary source of income in the areas of Cachi and San Gerardo. Production cost for crop farming and livestock is extremely depressed because farming system follows conventional method without using machinery and equipment; as agricultural inputs, locally available resources are used.

Table: Source of Income by Sector

Area	Source of Income						Total
	Agriculture		Livestock		Non-agriculture		
	US\$/Year	(%)	US\$/Year	(%)	US\$/Year	(%)	US\$/Year
Sigsig	238	(9.5)	263	(10.4)	2,017	(80.1)	2,518
Suscal	5	(0.1)	516	(18.9)	2,216	(81.0)	2,737
Oña	1,128	(45.3)	583	(23.4)	780	(31.4)	2,491
Cachi	344	(7.7)	2,314	(51.8)	1,812	(40.5)	4,470
Bulan	1,893	(37.0)	1,006	(19.7)	2,220	(43.4)	5,119
San Gerardo	126	(1.3)	4,530	(46.6)	5,065	(52.1)	9,721
Average	3,734	(13.8)	9,212	(34.0)	14,110	(52.2)	27,056

Source: Socio-economic Survey by the Study Team (2003)

An average monthly income per person (Including total family members) is US\$ 82.2 in the Study Area in general, which outstrips by far the poverty line in Ecuador, which is US\$ 55/month; the highest income falls on the area of San Gerardo and the income in the areas of Sigsig and Suscal is below the poverty line.

Table: Average Monthly Income

Area	No. of Family Member	Income per Person	
		US\$/Year	US\$/Month
Sigsig	4.0	629	52.4
Suscal	6.2	442	36.8
Oña	3.5	712	59.3
Cachi	3.6	1,242	103.5
Bulan	5.2	984	82.0
San Gerardo	5.1	1,906	158.8
Average	4.6	986	82.2

Source: Socio-economic Survey by the Study Team (2003)

Of the 61 surveyed farmers, 22 farmers has income stemmed from remittance from their family member(s) working within the country or abroad as migrant workers, representing considerable portion of their income; in the area of Suscal, 8 farmers of 10 surveyed farmers had income derived from the said remittance and in the area of Cachi, 7 farmers of 10 surveyed farmers had the same source of income. As the table above indicates, there is a distinct disparity between the monthly average income of Cachi and that of Suscal, which may be explained by the fact that the greater portion of household income of farmers in the area of Suscal depend on income stemmed from non-agricultural sector (remittance by migrant workers), meanwhile in the area of Cachi, almost the same amount of income as non-agricultural sector was gained from cattle farming.

Table Farmers with Income as Migrant Workers

Area	No. of Surveyed Farmers	No. of Farmers with Income as Migrant Workers
Sigsig	21	5
Suscal	10	8
Oña	29	-
Cachi	10	7
Bulan	10	1
San Geraldo	10	1
Total	61	22

Source: Socio-economic Survey by the Study Team (2003)

An average income per month is US\$ 82.2/person exceeding the poverty line; of 61 farmers surveyed, 9 farmers had a monthly income below the extreme poverty line (US\$ 28/person) and 15 farmers below the poverty line. The proportion of the farmers with monthly income below the extreme poverty line and the poverty line is the highest at Sigsig area, representing 14 of 21 farmers surveyed, which is followed by Suscal area with 5 of 10 farmers surveyed. Meanwhile, no farmers surveyed had income below the poverty line in Cachi area. In this analysis, monthly income of farmers surveyed includes income derived from non-agricultural activities.

Table Farmers with Income below Poverty Line and Extreme Poverty Line

Area	No. of Surveyed Farmers	Income Below		Subtotal
		Poverty Line	Extreme Poverty Line	
Sigsig	21	8	6	14
Suscal	10	2	3	5
Oña	-	-	-	-
Cachi	10	0	0	0
Bulan	10	3	0	3
San Geraldo	10	2	0	2
Total	61	15	9	24

Source: Socio-economic Survey by the Study Team (2003)

(2) Expenditure

Household expenditure was surveyed with regard to such items as “Food”, “Education”, “Water & Energy”, “Transportation”, “Clothes”, “Medical Services” and “Miscellaneous Cost”. An average yearly expenditure among 61 surveyed farmers amounted to US\$ 438/person, less than US\$ 40/person/month. By item, food cost occupied the largest proportion with an amount of US\$ 240/year, or equivalent to nearly 55% of the total expenditure; next to food was transportation cost, followed by education cost, water and energy cost, clothes cost and medical services cost, in order of proportion to the total expenditure. The transportation cost accounted for 12% of the total expenditure, which suggests that activities of farmers in the Study Area are not limited within their communities but are connected with surrounding communities and cities.

Table Average Expenditure of Farmers' Household by Item (Unit: US\$)

Area	Food	Educa-tion	Water & Energy	Transpor-tation	Clothes	Medical Services	Total
Sigsig	119 (73.4%)	3	8	18	8	6	162
Suscal	248 (56.4%)	20	39	84	40	9	440
Oña	126 (53.2%)	25	16	12	40	18	237
Cachi	308 (60.2%)	60	61	45	29	9	512
Bulan	293 (47.7%)	111	65	72	58	15	614
San Geraldo	347 (52.0%)	108	39	110	46	17	667
Average	240	54	38	56	36	12	438

Source: Socio-economic Survey by the Study Team (2003)

In the areas of Suscal and Sigsig with higher poverty index, the proportion of food cost is higher than other areas and that of education cost is, by contract, lower than other areas, with a proportion to the total expenditure less than 5%, despite the remaining area accounted for more than 10%.

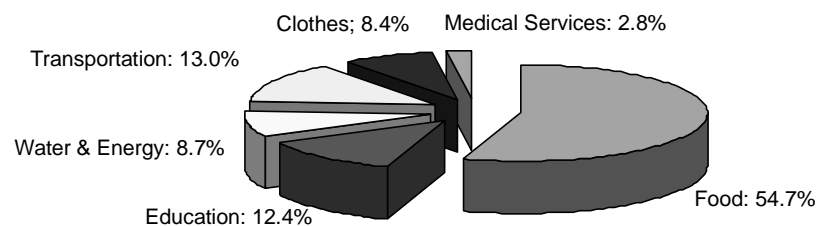


Fig.: Percentages of Farmers' Household Expenditure Items (%)

(3) Balance of Farm Household Economy

Referring to income and expenditure analysis of surveyed farmers cited before, farm household economy was summarized as given below. The balance of farm household economy resulted in surplus for all of surveyed farmers. By area it was revealed that farm household income was more depressed in Sigsig, Suscal and Oña than the rest of areas; especially, the lowest income level falls on the area of Suscal in which farmers mainly engage in production of subsistence-oriented crops and maintain their household economy depending on income derived from non-agricultural activities (remittance to be made by their family members working outside the region). By contrast, farmers in the areas of Cachi, Bulan and San Geraldo enjoyed higher farm income with higher proportion of income from livestock activity.

Table: Annual Balance of Farm Household Economy by Area (Unit: US\$)

Item	Sigsig	Suscal	Oña	Cachi	Bulan	San Geraldo	
1. Income per capita (US\$/Year)	540	442	712	1,242	984	1,906	
2. Household Income (US\$/Household/Year)	2,518	2,737	2,491	4,470	5,119	9,721	
2.1 Farm Income	Agriculture	238 (9.5%)	5 (0.1%)	1,128 (45.3%)	344 (7.7%)	1,893 (37.0%)	126 (1.3%)
	Livestock	263 (10.4%)	516 (18.9%)	583 (23.4%)	2,314 (51.8%)	1,006 (19.7%)	4,530 (46.6%)
2.2 Non-agricultural Income ^{1/}	2,017 (80.1%)	2,216 (81.0%)	780 (31.4%)	1,812 (40.5%)	2,220 (43.4%)	5,065 (52.1%)	
3. Expenditure per capita (US\$/Year)	162	440	237	512	614	667	
Cost for Foodstuff	119 (73.5%)	248 (56.4%)	126 (53.2%)	308 (60.2%)	293 (47.7%)	347 (52.0%)	
Cost for other items	43 (26.5%)	192 (43.6%)	111 (46.8%)	204 (39.8%)	321 (52.3%)	320 (48.0%)	
4. Balance per capita (US\$/Year)	378	2	474	730	370	1,239	

Remarks: 1/ includes overseas remittance and wages for working within the region.

3.4.3 Awareness of Farmers on Source of Poverty

The surveyed farmers as a whole are aware that poverty situation of the region incriminates depressed income, which is closely related with low productivity and profitability of agricultural and livestock sector, the leading industry of the region. This unsatisfactory situation of the sector in question may attributable to under-development of productive infrastructure such as “Limited farm size” and “Steep slope” as well as to immature farm administration such as “Inadequate farming technologies”, “Deficient capital” and “Disadvantageous marketing condition”. In addition, lack of labor force caused by absence of male adults to have been left seeking for employment opportunity outside the region constitutes one of the constraints on development of the region, and local people are not likely to appreciate the areas where remittance of overseas migrant workers accounts for greater portion of the income among farmers.

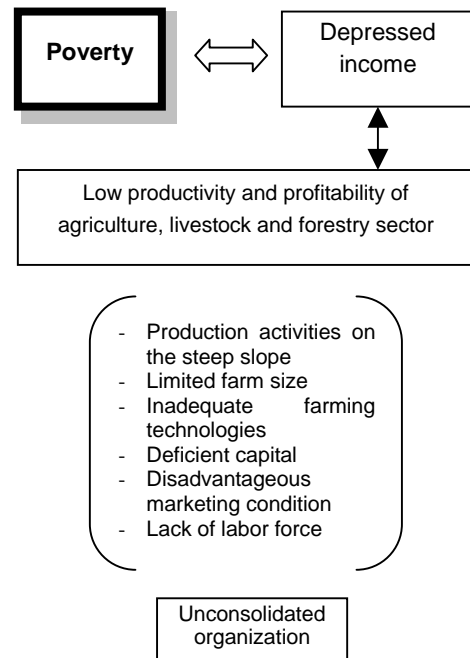


Figure: Awareness of Farmers

Apart from those mentioned above, it was pointed out that local people laid special stress on “Unconsolidated organization” of their organization and that this situation formed the basis of such constraints. It is judged that this viewpoint reflects the awareness of the local people on the importance and possibility of an organization, because cooperative activities is a long-established custom there.

Meanwhile, the development of the agriculture and livestock sector varies area by area and the awareness of people on relevant constraint on the sector is different accordingly.

Meanwhile, in the area of Sigsig where cash crops are introduced, it is identified as prevailing problems that farm productivity is depressed due to absence of irrigation system and adequate technical extension services are not rendered because proposed beneficiaries are not in a position to compensate the services.

In the area of Suscal where subsistence-oriented farming prevails, vulnerability of crops to damage according with precipitation, wind velocity and attack by harmful insects is recognized as major problem. And, it is also recognized as the point at issue that the varieties of crops and pest-control method corresponding to the unfavorable natural conditions have not been introduced to the area due to lack of relevant knowledge. It is thereby presumed that basic issues on raising farm productivity remain outstanding in the area where subsistence farming is mainly conducted.

On the other hand, in the area of Oña where low productive traditional farming is conducted, farmers are forced to engage in subsistence farming without being rendered technical assistance on irrigation farming, although the area is equipped with small-scaled irrigation works constructed by farmers’ association. This situation is due to difficulty of the area in marketing of their products because the area is located far from major consumption centers and transportation cost of the products to there is elevated. For development of the area, the farmers in this area are well aware of the necessity to introduce market-oriented products by upgrading subsistence farming and launching on farming of cash crops.

And in the area of Bulan where advanced farming is carried out, awareness of local people on problems is varied; for raising income, local people are aware of the necessity to tackle with such outstanding problems as inferior quality of products, absence of proper measures in controlling marketing of products, deficient financial resources for modernization of farming activities, etc.

Finally, in the area of Cachi where more income of farmers is represented by remittance by migrant workers, deficient provision of feed and inadequate sanitary control of animals identified as main sources for low productivity of cattle farming and in the area of San Gerardo where advanced cattle farming is conducted, farmers are likely to point out unsatisfactory marketing of products more seriously.

Table: Prevailing Characteristics and Major Constraints Identified by Farmers

Name of Area	Prevailing Agriculture and Livestock farming	Major Constraints Identified by Farmers
SIGSIG	Combination of subsistence farming and cash crops farming	Insufficient supply of irrigation water to realize high-productive farming and farmers are not in a position of receive technical extension services due to declined farm income.
SUSCAL	Subsistence farming	Absence of basic farming technologies such as deficient knowledge and technologies on introduction of crops varieties and pest control method suitable to natural conditions of the area.
OÑA	Subsistence farming (Under irrigation)	Inadequate farming practice without rational use of existing small-scaled irrigation works and absence of cash crops and relevant farming technologies for forwarding products to major consumption center.
BULAN	Cultivation of cash crops	Absence of relatively advanced farming technologies on cultivation of high quality products and of proper measures in controlling marketing of products.
CACHI	Cattle farming	Basic factors such as depressed milk production per head of cattle due to deficient provision of feed and immature grazing practice (administration of grazing land, raising method, sanitary control of animals).
SAN GERARDO	Relatively advanced livestock farming within the Study Area	Relatively advanced administration method of cattle farming represented by marketing of products, etc.