

Chapter 4

Plan of Inter-institutional Linkage System for Small Scale Farmers

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4.1 Inter-institutional Linkage System

The formulation of concrete procedures, the role of each institution as well as the respective responsibilities of each one within the Inter-institutional Linkage System are proposed and they are directed to conform with the supporting system for small-scale farmers, in accordance with the basic guidelines. As previous conditions for this plan, the experiences of the Tungurahua Agreement and the Provincial Agricultural Council under implementation in the Sierra zone are to be analyzed in order to take advantage of the Lessons Learned of said cases and to establish the coordination system identifying the points to be taken into account for the Agricultural Forum and the Agricultural Roundtable.

4.1.1 Existing Linkage systems

There are very few examples of Inter-institutional Linkage Systems for the support of small-scale farmers in the Sierra; a successful example presently in execution is the Tungurahua Agreement. Also, the Chimborazo Agricultural Agreement that was conformed by the institutions pertinent to the MAGAP is to be considered.

(1) Tungurahua Agreement

- Antecedents of the Tungurahua Agricultural Agreement

The Tungurahua Agreement was formulated based on the agricultural strategy of the Tungurahua province, with the participation of all actors concerned with the agricultural development of the province. It started in July 2005, by the preparation of a list with all actors related with the agricultural sector and continued up to the formulation of the provincial agricultural strategy that was finally approved in April 2007 during the Forum promoted by the same province by the 350 actors involved with the agricultural sector in the province.

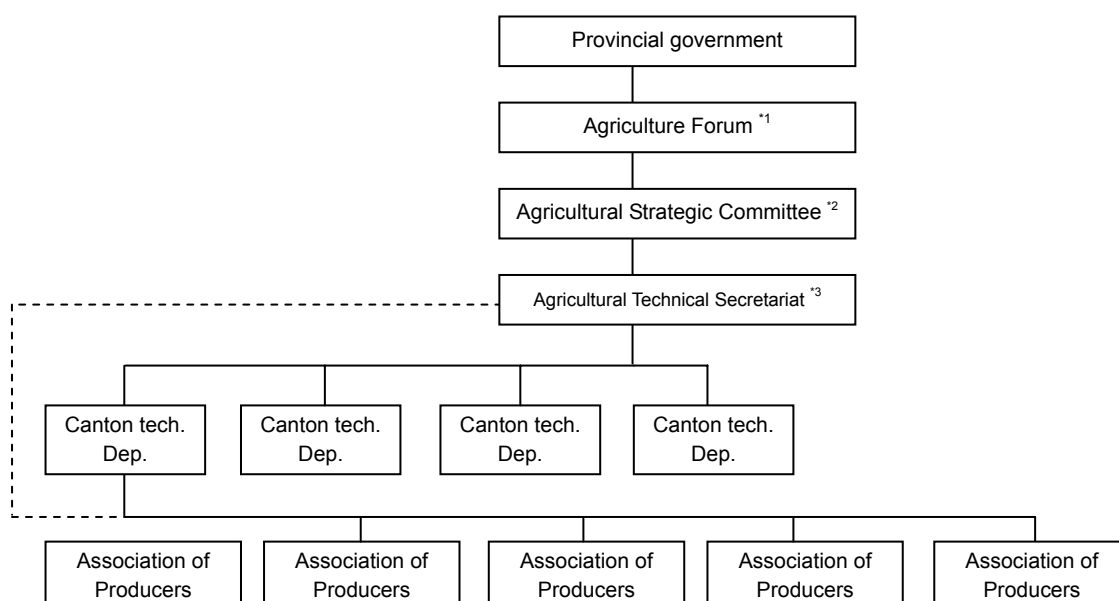
Table 4.1.1 Main activities conducted up to the approval of the agricultural development strategy of Tungurahua

Date	Activities up to the signature of the agricultural strategy
July- August 2005	List of involved entities
December 2005	Forum, workshops and seminars at canton level
January – October 2006	Preparation of the agricultural strategy and at regional and canton level
November 2006 to February 2007	Policies of agricultural strategy of each canton and priority order
February 2007	Definition of agricultural strategy policies
March– April 2007	Preparation of the implementation agreement of agricultural policies and strategy
April 2007	Political forum to divulge the strategy contents to the related governmental entities
April 2007	Approval of the agreement and agricultural strategy of the cantons at the provincial and municipal councils.
April 2007	Signature of the agricultural strategy by the 350 participants in the Forum sponsored by the province

The actions conducted up to the signature of the Tungurahua agricultural agreement are very similar to the ones necessary for the formulation and implementation of the future territorial ordainment plan (TOP) prepared at national level by the municipalities and provincial governments. Firstly, the list of actors concerned with the agricultural strategy was prepared and this is the same activity to be conducted by the canton governments for territorial development, in preparing a list of the actors involved with each development issue. The same methodology is applied to the elaboration of the provincial development plan that is the result of the sum of the development plans of each canton. Presently, the elaboration of territorial plans has started and the final result is still uncertain; however they should aim toward the same goal of the agricultural sector, with the basic idea of involving all actors in the formulation of the TOP , like in the preparation of the Tungurahua Agricultural Strategy, with the signature of all those concerned. However, the Inter-institutional Linkage System of the agricultural supporting entities proposed in the present Study is based in the territorial ordainment plan of both cantons and provinces; thus, the approval of the actors involved with the agricultural sector TOP at canton level is also required.

- Implementation system for projects based in the Tungurahua agreement

Agricultural development projects of the provincial and canton governments at the Tungurahua province are basically implemented under the following system. Information referring to projects of the MAGAP, INIAP, BNF, and other governmental institutions, in addition to NGOs are collected through the agricultural Forum.



Note: For details of *1, *2 and *3, see Table 4.1.2

Figure 4.1.1 Implementation system of the agricultural strategy of Tungurahua

Relevant entities comprised in the implementation system of the Tungurahua Agricultural Strategy are the “Agricultural Forum”, the “Agricultural Strategy Committee” and the “Agricultural Technical Secretariat”. Following, profiles of the same are presented.

Table 4.1.2 Profiles of the most relevant institutions

Institution	Profile
Agricultural Forum	<ul style="list-style-type: none"> • Forum with the participation of all entities concerned with the province agricultural development. Starting point for the establishment of the Tungurahua Agricultural Committee. • It is assembled once a year for the presentation of development results achieved during the year and to establish policies for the next year. Around 130 persons assisted in 2009 • Important decisions such as changes in personnel of the agricultural strategic committee require the approval of this forum.
Agricultural Strategic Committee	<ul style="list-style-type: none"> • Establishes the guidelines for the execution of the strategy for the provincial agricultural development. For instance, there are 9 axis of provincial agricultural development such as “technical dissemination”, “technical training”, “institutional strengthening”, “agro ecological conservation” and “irrigation” and the priority issues are determined by said Committee. It approves the individual projects of agricultural development and requests the budgetary measures for such purposes from the provincial government. Manages the collection of information about agricultural development projects in the province. • Each municipality has prepared its own development strategy for the formulation of the Tungurahua development strategy; those not capable of preparing their own plan were assisted in the matter. • Liaison with the international cooperation. However, agreements are signed by the provincial government. • Presently, it has 18 members. It is conformed by the provincial MAGAP, provincial government, municipalities, producers associations, universities and international cooperation institutions. • The committee has an elected coordinator; presently, it is the Director of Planning of the provincial MAGAP.

Institution	Profile
Agricultural Technical Secretariat	<ul style="list-style-type: none"> • Preparation of development projects together with the municipalities. Projects pass through the strategic committee to get the budget. Technical assistance in the preparation of projects of support to small-scale farmers and technical assistance for the technical management of municipalities. • In some cases it provides direct assistance to associations of producers without the intervention of the canton government. • In the beginning, 4 persons were assigned but due to more work, nowadays it has 8 members (1 from the MAGAP, 2 from the international cooperation, 5 from the provincial government (3 agronomists, 2 veterinarians). Hiring of 3 experts in agricultural management is planned.

- Considerations in relation to the Tungurahua Agreement and concerned entities

The main governmental entities of support to small-scale farmers are the provincial government, canton governments, MAGAP of Tungurahua province and other entities that carry out activities of support to small-scale farmers; Tungurahua agricultural committee builds a win-win relationship. A scheme of the relationship between the Tungurahua agricultural committee and other supporting entities to small-scale producers is shown below.

Table 4.1.3 Relationship between the Tungurahua agricultural committee and other supporting entities

Supporting entity to the small-scale producer	Summary
Provincial Government	<ul style="list-style-type: none"> • Most of the budget for the provincial agricultural development passes through the implementation system of Tungurahua agricultural strategy. So, this system can be considered as part of the implementation system of Tungurahua's provincial government agricultural development projects. • Most of the development budget is used to subsidize agricultural development projects of the municipalities.³⁶ • Under this system, development projects are planned in the strategic technical secretariat and approved by the strategic committee. In the end, Provincial government assigns the budget. So, the final decisions regarding the approval of projects are in charge of the provincial government. • In this system, provincial MAGAP would be the brain, and the canton governments, farmers associations, universities, NGOs and international cooperation entities occupy an important position so as to allow provincial government to implement the agricultural development strategies effectively and efficiently, at the same time assuring transparency and responsibility.
Canton Government	<ul style="list-style-type: none"> • Canton Governments are responsible for the implementation of agricultural strategy prepared at canton levels, in the frame of the Tungurahua agricultural strategy. Financial assistance is provided by the provincial government and it is possible to get technical assistance from the provincial government and the provincial MAGAP office. It enhances considerably the very limited capacity of project execution by the canton governments. • Previously, cantonal governments were not capable of hiring technical personnel due to budgetary restrictions; presently it is possible with the support of the provincial government.

³⁶ This subsidy is based on the agreement signed between the provincial government and the municipal governments. The agreement specifies the actions, input and results based on the canton agrarian strategy that comprises the provincial development strategy and details the division of responsibilities in the budget. Based on this agreement, municipal government should submit a half-year monitoring report in relation to the activities, input and results.

Supporting entity to the small-scale producer	Summary
Provincial MAGAP	<ul style="list-style-type: none"> Provincial MAGAP is the main implementer of the provincial reactivation plan and almost never executes individual projects; they are executed through the agricultural strategic committee of Tungurahua. MAGAP technicians are members of the strategic technical secretariat and the agricultural strategic committee, forming thus, the cooperation between the agricultural strategy of Tungurahua and the MAGAP projects and programs. With this system, dissemination projects of provincial MAGAP are implemented in cooperation with the provincial and canton government projects.
Parroquia government	<ul style="list-style-type: none"> Presently, parroquia governments still do not have an important position in this system However, according to the new Constitution, they will have an important role in the support of small-scale farmers in the future. Their concrete participation within the system of the agricultural strategy implementation is a very important issue to be discussed and should be defined in the next agricultural forum.

- Lessons Learned regarding the Tungurahua Agricultural Committee

Activities of the Tungurahua Agreement were launched in July 2005. The objective is similar to the coordination system proposed in the present Study, in which the foundation of the linkage system resides in the participation of all actors of agricultural institutions involved with the formulation of the plan; therefore, it can be said that the process to establish the linkage system is also similar. Thus, the Tungurahua Agricultural Agreement, as well as its implementation system can be taken as a quite useful reference for the present Study. Following, a scheme of the Lessons Learned from the Tungurahua Agreement is presented.

Table 4.1.4 Tungurahua Agreement Lessons Learned

Lessons Learned	Contents
The Inter-institutional Linkage System by stages	<ul style="list-style-type: none"> It took around one year and nine months to establish the Tungurahua agricultural committee. This process occurred by stages and it progressed based on the results reached at each stage
The Agricultural Forum is basically the supreme entity of the Tungurahua Agreement	<ul style="list-style-type: none"> The important contents and policies related to the development are approved by the Tungurahua agricultural forum. The agricultural forum is convened each year at the provincial level with the participation of all actors involved in the agricultural sector.
Implementation of measures for small-scale farmers in poverty are centered in the canton governments	<ul style="list-style-type: none"> The implementation of agricultural development under the Tungurahua Agreement is centered in the canton governments.
The provincial government and the provincial MAGAP center their actions in the support to canton governments	<ul style="list-style-type: none"> The provincial government provides economic support and technical assistance to the canton governments. The provincial office of MAGAP provides technical assistance to the canton governments
An agricultural committee to take care of the direction and the most relevant issues has been established	<ul style="list-style-type: none"> The agricultural committee evaluates the guidelines of agricultural development at provincial level, as well as the implementation of agricultural development strategies. The agricultural committee is comprised of the main members of the Forum.

Lessons Learned	Contents
A technical secretariat for the agricultural strategy has been established to prepare, among other things, the agricultural plan of the municipalities	<ul style="list-style-type: none"> • Support to prepare the implementation plan of the strategic agricultural development plan of the cantons' municipalities. • Technical assistance to the municipalities for the formulation and concrete implementation of agricultural development projects • The strategic technical secretariat is comprised of the main members of the Forum.
The provincial government is ultimately responsible for the Tungurahua Agreement	<ul style="list-style-type: none"> • The provincial government is the major responsible party. • The provincial government manages the agricultural technical secretariat, the agricultural committee and the forum.

(2) Agricultural Evaluation Committee of Chimborazo province

The provincial agricultural evaluation committee is an institutional coordination entity established by MAGAP. The provincial agricultural evaluation committee was established in 1977 by Ministerial resolution and modifications were made later concerning functions and regulations in 1985 and 1994. In Chimborazo province, this Committee was operative about until 2005, presently it is in force but no activity is conducted.

- Members of the Evaluation Committee

It is comprised of the MAGAP and concerned institutions such as INDA, BNF, INCA, INIAP and INAR. Local, provincial and municipal governments are not considered among the institutions.

- Functioning of the Evaluation Committee

Main functions of the Evaluation Committee established in the MAGAP resolution were:

- ✓ Identification of problems pertaining to provincial agricultural development
- ✓ Promote the implementation of agricultural development policies that were initially formulated by the MAGAP and its concerned institutions.
- ✓ Coordination between the public and private sector in the implementation of projects
- ✓ Support in the execution of MAGAP provincial offices' projects
- ✓ The role of provincial MAGAP in the Evaluation Committee is to manage the same and coordinate with other public institutions related to the agricultural activities inside the province.

- Lessons Learned from the Agricultural Evaluation Committee of Chimborazo province

The activities of the Agricultural Evaluation Committee of Chimborazo province effectively ended 10 years ago and presently no action is conducted. One of the main causes for this situation is related to the decentralization policy conducted by the Ecuadorian government, through the transfer of functions in the implementation of agricultural development projects to

local governments. Another cause to be considered is the lack of resources of the MAGAP provincial office, the main entity in the Agricultural Evaluation Committee that impeded the realization of independent interventions and it did not assign positions of leadership to the other members of the Committee. On the other hand, Annual Operative Plans (AOP) were exchanged among the concerned institutions and it allowed a better understanding of the activities conducted by each institution, depending on the involved persons.

Table 4.1.5 Lessons Learned from the Agricultural Evaluation Committee of Chimborazo

Lessons Learned	Contents
Improve mutual understanding in relation to the activities developed by the members	<ul style="list-style-type: none"> • Exchange of information among the institutions promoting mutual understanding
Continuity of coordination activities was not possible in the linkage system	<ul style="list-style-type: none"> • A concrete development plan for the province was nonexistent, consisting of a linkage system with unclear objectives. • Lack of budget to conduct activities in an independent way and to maintain the linkage system. • The provincial office of MAGAP had restrictions concerning project implementation criteria.

4.1.2 System of institutional Cooperation under the New Constitution

The new Constitution clearly establishes the role of the central and local governmental institutions regarding national development. Concerning small-scale farmers in poverty, who are the objective of the present Study, the roles are quite clear; while MAGAP is in charge of formulating sector plans at the national level, the implementation of projects is under the responsibility of regional, provincial and parroquia governments. However, regional governments are not established yet and this should occur at a later stage; therefore, the schedule for the creation of said governments and details about functions as well as other aspects are yet to be defined. Also, as established by the Constitution, regional development of Ecuador should be based on the territorial development and it is established that this is the responsibility of the provincial

Table 4.1.6 Role of government entities in the new Constitution

Entities	Role in the development of small-scale farmers
MAGAP	Elaboration of policies for the agricultural sector and rural communities
Provincial government	Entity responsible for the territorial development. Formulation and implementation of territorial development at provincial level. Implementing entity of the agricultural development.
Canton government	Formulation and implementation of territorial development at canton level
Parroquia government	Implementing entity of the agricultural development

governments. Hence, territorial plans are presently being formulated at canton level through the municipal governments under orientation of the provincial governments. The elaboration of the TAP at provincial level should occur once the plans at canton level are finished.

According to the new Constitution, the TAP is the most important previous condition for the institutional reorganization proposed in the present Study and each institution within the

Inter-institutional Linkage System is required to follow said plan. On the other hand, regional development was launched under the new Constitution only recently, and the political framework for the support to small-scale farmers is in the transferring stage. Therefore, it is necessary to carefully evaluate the role of the support to small-scale farmers under the Inter-institutional Linkage System considering the role developed by each institution at the moment, as well as the future programmed plans.

The agricultural production activities presently carried out by small-scale farmers are centered on activities of communitarian production and transportation; in a very few cases it ranges to the level of provinces. On the other hand, territorial development is executed at canton and provincial levels; so in principle, support to small-scale farmers should be conducted by canton governments. However, when support expands beyond the boundaries of the canton towards larger areas or when the support is at the national level, each institution has to take charge of the support to be provided. This situation can be inferred from the example of the implementation conditions and the system of the Tungurahua Agricultural Agreement in which canton governments are in charge of the majority of the agricultural development projects. Also, according to the new Constitution, parroquia governments are the implementing entities of agricultural developments but considering the present level in several aspects such as technology, human resources and budget, the implementation capacity is very limited and while strong policies to strengthen the capacity of parroquia governments are not implemented, they will not be able to be the central entity to provide support to small-scale farmers.

It would be most proper if the implementation of the support to small-scale farmers were to be centered in canton governments but considering the actual situation, capacity of canton governments both in technical and financial aspects are insufficient. Regarding the province of Chimborazo as an example, the execution of support to small-scale farmers is presently centered in the province and taking a closer look, the same occurs with the Tungurahua Agreement. On the other hand, the provincial TAP is prepared from the sum of all territorial plans at canton level, therefore, plans of the cantons are the elements to structure the provincial plan; thence, the provincial TAP is the same as the canton's. So, for the provincial government, the implementation of the canton government development plans is equivalent to the implementation of the provincial development plan. In this way, under the territorial development plan, provincial governments should provide financial support to the canton governments. This situation effectively occurs in the division of responsibilities between the provincial government and the canton governments under the Tungurahua Agreement. Canton governments count on coping with little technical personnel and do not have much experience with agricultural development projects; and technical assistance is indispensable. Therefore, the provincial office of MAGAP, the regional government and other concerned institutions provide technical assistance required by canton governments. Considering the situation of current activities and the above mentioned conditions concerning the division of roles of the main institutions for the development of small-scale farmers under the new Constitution, it should be as follows.

Table 4.1.7 Division of roles for the development of small-scale farmers in poverty

Supporting entity	Division of roles for the development of small-scale farmers in poverty
MAGAP	<ul style="list-style-type: none"> • Formulation and implementation of the agricultural sector national policies and dissemination of the system to provinces and cantons • Implementation of rural agricultural development projects and programs at national level, already in course through the implementation of “Buen Vivir Rural”. • Continuity of current functions in the provincial offices of MAGAP at national level regarding dissemination of projects, individual projects, cooperation with other entities, etc.
Provincial Government	<ul style="list-style-type: none"> • Elaboration of the territorial plan at provincial level and support to municipalities in the elaboration of their plans. • Implementation of agricultural developments at provincial level • Support to canton governments in development projects, as the entity responsible for the territorial development
Canton Government	<ul style="list-style-type: none"> • Elaboration of a territorial plan at canton level • Implementation of agricultural development at canton level
Parroquia Government	<ul style="list-style-type: none"> • Implementation of projects together with the provincial and municipal governments. Parroquia government has budgetary restrictions, so its contribution is at the human resources level.

4.1.3 System of institutional Cooperation for the Support to Small-scale Farmers

It is necessary to establish a system of institutional cooperation for the support to small-scale farmers both at canton and provincial levels; for such, the structure of said system is proposed in the following Figure. Services for the benefit of small-scale farmers under this scheme would be centered in activities at canton level following the example of Tungurahua province. This means that several institutions and entities would act under a coordinated policy of agricultural development, close to the small-scale farmers, through the Forum. On the other hand, the system of institutional cooperation at provincial level will consist basically of the coordination of actions oriented to small-scale farmers, pertinent to those things that are to be implemented at provincial level by reasons of technical, financial and human resources provided by the provincial government or by the MAGAP to the municipalities or other entities.

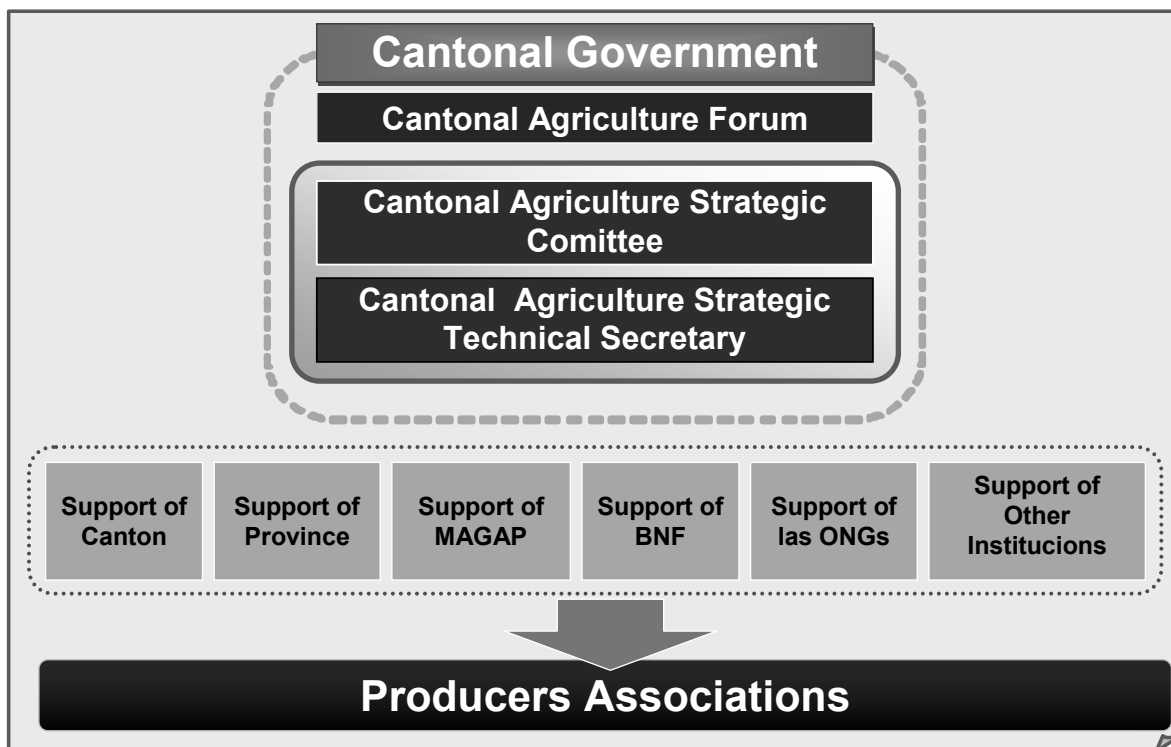


Figure 4.1.2 Division of roles for the development of small-scale farmers in poverty

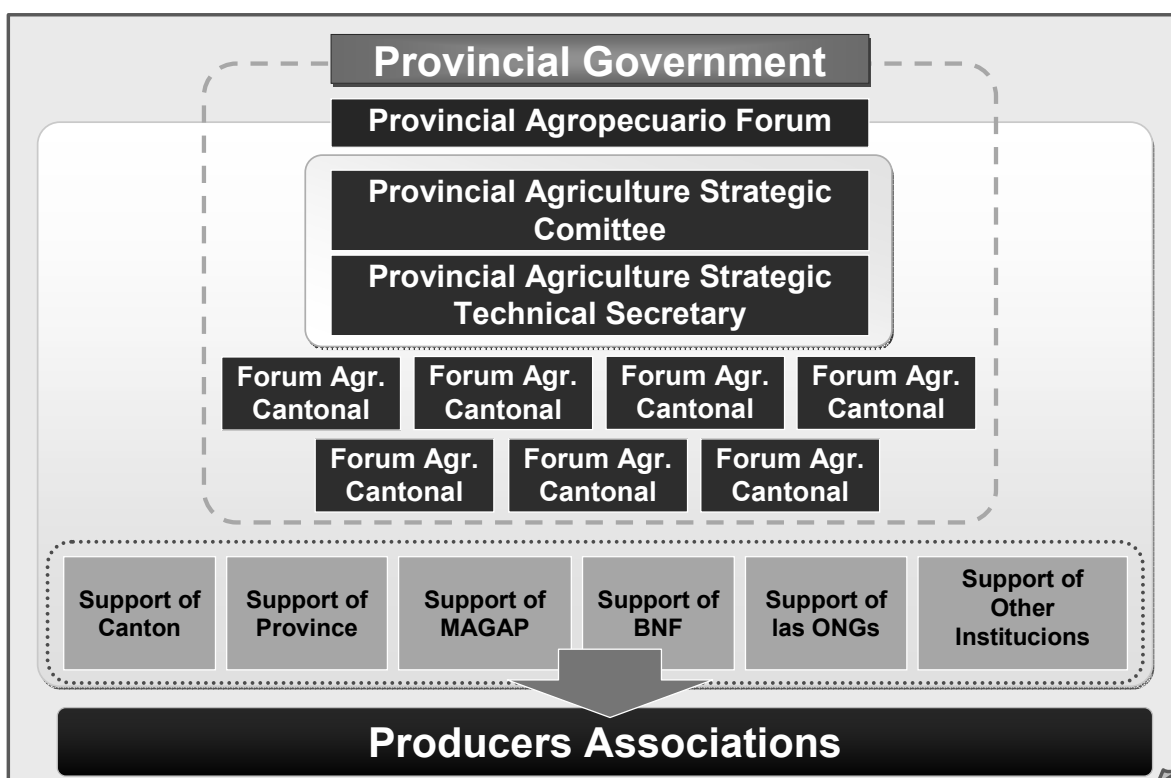


Figure 4.1.3 System of institutional Cooperation at provincial level

Following, the functions to be performed by the forums, the strategic agricultural committee and the technical secretariat are proposed.

(1) Agricultural Forums

Said forums are to be integrated by all actors involved in the agricultural development at canton and provincial levels. They are to be periodically conducted (once a year) to share the achieved results among the members, as well as the basic development policies and to coordinate priority issues. However, forums are not to be only a place to organize an annual general assembly, but most important, it is to become an umbrella for the sector development, a place of co-management and institutional cooperation in different dimensions through the open and free exchange of information among the members. Thus, both canton and provincial governments should timely meet with the different work groups or periodically issue pertinent information, providing in this way, opportunities and opportunity for the interaction among the actors.

(2) Strategic agricultural committee

This commission is to be created in the respective canton and provincial roundtables in order to analyze and make decisions about basic policies of agricultural development at canton and provincial levels. This commission will collaborate with canton and provincial governments in the administration of forums, together with the support in the coordination and exchange of information among the forum members. Also, the provincial commission will be in charge of analyzing the different supporting policies to the municipality agricultural development, while the municipality commission will submit the requests to the provincial level. Canton and provincial committees are to be integrated by the representatives of the canton and provincial governments, MAGAP and other relevant entities and institutions involved in the issue of support to small-scale farmers.

(3) Strategic Agricultural Technical Secretariat

The objective of this secretariat is to provide technical support to the organizations that are providers of support services. Some of them might need technical support or to take lessons from projects previously executed by other organizations. The provincial technical secretariat should particularly attend to the technical requirements not only of canton governments, but also the other actors of support to small-scale farmers at canton level. Thus, this secretariat will provide technical support to the canton actors in close coordination with the canton unit responsible for the agricultural strategies.

(4) Members of the Committees and the Strategic Agricultural Technical Secretariats

Following, the members of those two entities at canton and provincial level is summarized.

Table 4.1.8 Members of the agricultural strategic committees and strategic agricultural technical secretariats

	Prov. Gov.	Munic. Gov.	MAGAP	Others	Notes
Canton Level					
Strategic Agricultural Committee	1	2	1	According to the needs	Provincial government and provincial office of MAGAP: responsible for municipalities
Strategic Agricultural Technical Secretariat	1	2	1		
Provincial level					
Strategic Agricultural Committee	1	By number of municipalities	1	BNF, universities, NGOs, international cooperation, etc.	Prov. Gov.: Chief of planning MAGAP: provincial director
Strategic Agricultural Technical Secretariat	3	—	3	Institutions under the MAGAP, universities, etc.	

Both the Committees and the technical secretariats are to be installed and administered by the respective canton and provincial governments.

4.1.4 Procedures for the establishment of an Inter-institutional Linkage System

In order to establish the institutional cooperation for the support to small-scale farmers it is important for entities and actors involved in agriculture to understand the objectives and their participation in the linkage system and the benefits to be obtained by each institution. In order to achieve the final objective, namely the implementation of development projects through a system of cooperation, it is necessary to implement the system by stages and in each of the stages, the activities and actors in charge, as well as the objectives and results to achieve have to be clearly defined. The following scheme shows the implementation stages of the linkage system for the support to small-scale farmers as well as the objectives, involved entities and results of each stage.

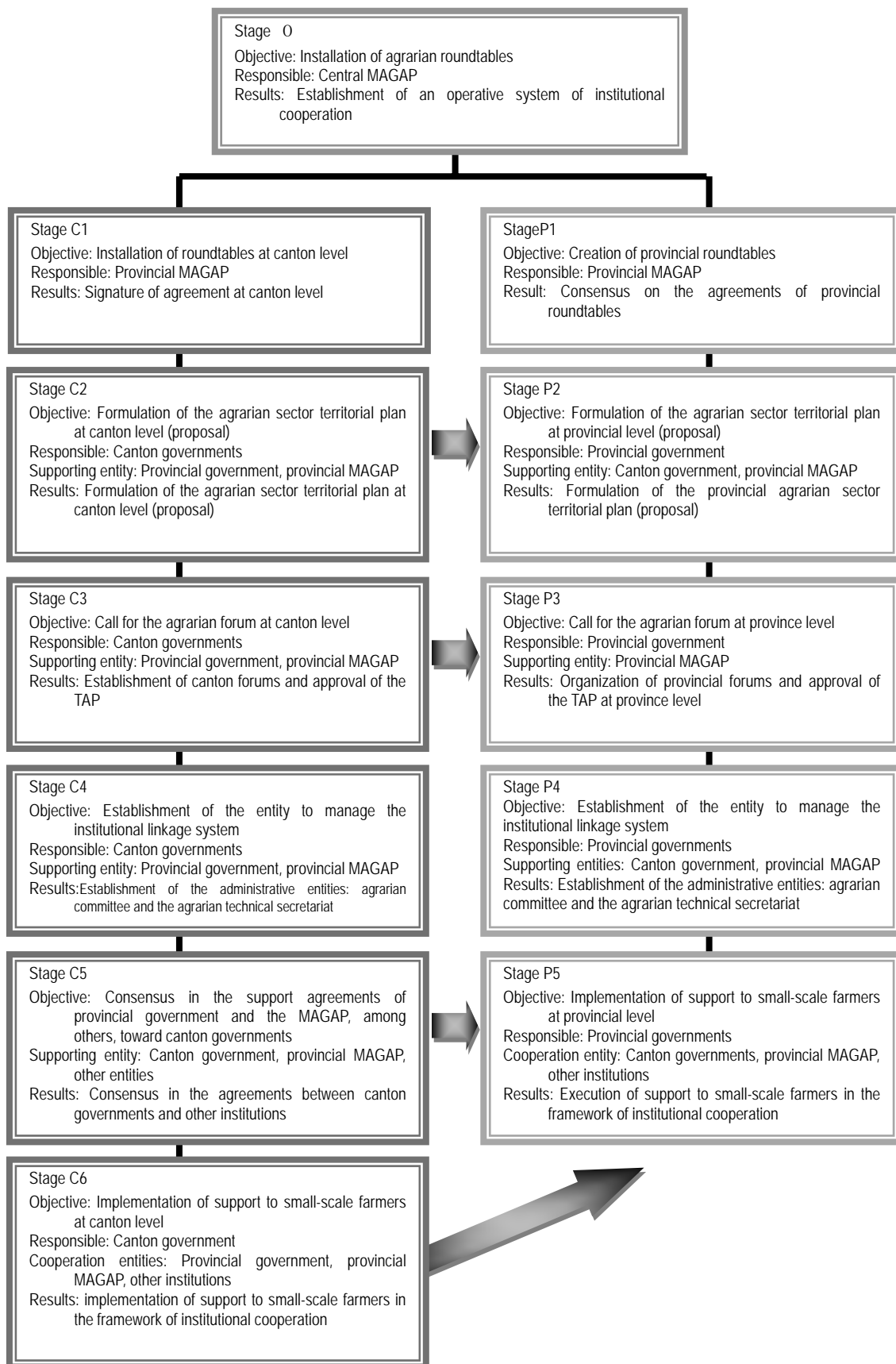


Figure 4.1.4 Procedures for the implementation of support to small-scale farmers through the Inter-institutional Linkage System

4.1.5 Activities at each stage up to the establishment of the Inter-institutional Linkage System

Followings shows the important points and contents of activities to be carried at each stage, up to the establishment of the Inter-institutional Linkage System. Regarding the input, they consist in costs of personnel, logistics, communications, office goods supply, etc. but each responsible entity and other involved entities should be in charge of them.

Stage 0

Objective: Installation of agrarian roundtables

Responsible: Central MAGAP

Results: Establishment of an operative system of institutional cooperation

[Activities and considerations]

- Creation of the office for the preparation of the agricultural roundtables at MAGAP headquarters
- MAGAP's Sub-secretariat of Planning or the Sub-secretariat of Institutional Reorganization should carry out the required procedures.
- Establishment of the Inter-institutional Linkage System and assignment of experienced personnel in the support to small-scale farmers to organize and work in the framework of said system.
- Observations: Design an organization scheme to allow the good use of experiences accumulated by the provincial MAGAP in Tungurahua to create the Inter-institutional Linkage System and in the support to small-scale farmers.
- The agricultural roundtables preparatory office should establish an Inter-institutional Linkage System in the Regional Sub-secretariat to share information.
- Promote understanding about the TAP by the members of the agricultural roundtables preparatory office.
- Seminar to promote the understanding of the TAP and the present plan directed to all personnel at national level
- Observations: It is convenient if all the technical personnel participate in this seminar after they have performed a central role at the canton roundtables.
- Integral support of activities to establish an Inter-institutional Linkage System in all provincial offices of MAGAP in the country.
- Preparation of a format for the monitoring of activities to establish the Inter-institutional Linkage System within the provincial MAGAP in order to regularly monitor activities and results (once a month).
- Provide support to provincial offices that require it according to the monitoring results.
- Other required activities

Procedures at canton level

Stage C1

Objective: Installation of roundtables at canton level

Responsible: Provincial MAGAP

Results: Signature of agreement at canton level

[Activities and considerations]

- Creation of a “Task Force” by the provincial MAGAP to promote the Inter-institutional Linkage System.
- Selection by the provincial MAGAP of responsible experts in the canton and parroquia governments.
- Observations: Experts of the Provincial offices assigned for each canton should basically be in charge of attending to the municipalities and the parroquias. Otherwise, the respective chief of provincial MAGAP will assign the responsible persons.
- Explain about the mechanism of the Inter-institutional Linkage System at canton level to the authorities of provincial, municipal and parroquia governments, who are the probable members of the respective canton roundtable and achieving a consensus for its conformation.
- Preparation of the agreement to establish the canton roundtable and the signature of said document by the concerned parts.
- Observation: The three objectives of the roundtable are explained in Chapter 3. In the agreement both the objectives and the main activities to be carried out by each entity in order to achieve said objectives should be specified.
- Organization of the cantons' first roundtable and transfer the administration of said round table to the canton government.
- Monitoring of activities and results to communicate them to the Office for the Promotion of Agricultural Round Tables at MAGAP headquarters.
- Other required activities

Stage C2

Objective: Formulation of the agrarian sector territorial plan at canton level (proposal)

Responsible: Canton governments

Supporting entity: Provincial government, provincial MAGAP

Results: Formulation of the agrarian sector territorial plan at canton level (proposal)

[Activities and considerations]

Canton Governments

- Prepare the TAP assisted by the SENPLADES and by the provincial government.
- Participate in the canton agricultural roundtable and obtain the necessary information to prepare the provincial government agricultural TAP and the provincial MAGAP.

- Considerations: In the agricultural TAP the operative system of the project should necessarily be specified in the framework of the institutional cooperation.
- Prepare the canton agricultural draft TAP and submit it to the agricultural roundtable.
- Other necessary activities

Provincial governments

- Provide information and support to canton governments for the preparation of the agricultural TAP, through the roundtable.
- Other necessary activities

Provincial MAGAP

- Provide information and support to canton governments for the preparation of the agricultural TAP, through the roundtable.
- Monitoring of activities and results obtained to inform the Office for the Promotion of Agricultural Round Tables at MAGAP headquarters.
- Other required activities

Stage C3

Objective: Call for the agrarian forum at canton level

Responsible: Canton governments

Supporting entity: Provincial government, provincial MAGAP

Results: Establishment of canton forums and approval of the TAP

Canton Governments

- Select the basic participants according to the TAP and prepare the call for the canton agricultural forum.
- Considerations: Participants are to be selected in the roundtable. However, the participation in the forum will be basically free, so the largest number possible of members in the canton will be invited. Necessary preparation for attendance to the forum will be made, including reservations of local accommodations, printing of the draft TAP, etc.
- Chair the canton agricultural forum.
- Present the draft TAP to the participants, collect opinions and achieve the consensus and approval.

Provincial governments

- Support the activities of the canton governments for the call to the agricultural forum.

Provincial MAGAP

- Support the activities of the canton governments for the call to the agricultural forum
- Monitoring of activities and results obtained to inform the Office for the Promotion of Agricultural Round Tables at MAGAP headquarters.

Stage C4

Objective: Establishment of the entity to manage the institutional linkage system

Responsible: Canton governments

Supporting entity: Canton government, provincial MAGAP

Results: Establishment of the administrative entities: agrarian committee and the agrarian technical secretariat

Canton Governments

- Dissolve the agricultural forum and the agricultural roundtable that were formed to support the preparation of the agricultural TAP and create the agricultural commission incorporating the former members of the roundtable in addition to the representatives of the farmers' organizations and other relevant actors.
- Create the agricultural strategic technical secretariat under the agricultural commission as an entity of technical assistance and advisement in the canton projects of agricultural development to be implemented in the framework of the TAP and the institutional cooperation.

Provincial governments

- Cooperate and provide human resources for the creation of the agricultural commission and the technical secretariat.

Provincial MAGAP

- Cooperate and provide human resources for the creation of the agricultural commission and the technical secretariat.

Stage C5

Objective: Consensus in the supporting agreements of provincial governments and the MAGAP, among others, toward canton governments

Supporting entity: Canton government, provincial MAGAP, other entities

Results: Consensus in the agreements between canton governments and other institutions

Canton Governments

- Consensus for the technical and financial cooperation agreements between the provincial governments, provincial MAGAP and the institutions that integrate the forum.
- Support in the creation of the specific institutional cooperation between the different institutions forming the forum.

Provincial governments

- Consensus in the supporting agreement with canton governments.

MAGAP

- Consensus in the supporting agreement with canton governments.
- Monitoring of activities and results obtained to inform the Office for the Promotion of Agricultural Roundtables at MAGAP headquarters.

Carry out the projects of support to small-scale farmers in the framework of the institutional cooperation. Provincial MAGAP will monitor activities and results obtained to inform the Office for the Promotion of Agricultural Roundtables at MAGAP headquarters.

Stage P1

Objective: Creation of provincial roundtables

Responsible: Provincial MAGAP

Result: Consensus on the agreements of provincial roundtables

【Activities and considerations】

- Provincial MAGAP will create the Task Force to promote the institutional cooperation.
- Provincial MAGAP will assign the provincial director or the planning chief as responsible for the promotion of the institutional cooperation at canton level.
- Present the concept of institutional cooperation at provincial level to the constituents of the agricultural roundtable (provincial and municipal governments) and achieve the consensus for the creation of the roundtable.
- Prepare the agreement for the creation of the agricultural roundtable at the province and the signature of the same by the parts.
- Considerations: The three objectives of the roundtable are mentioned in Chapter 3. In the agreement, the main actions to be developed by each institution for the fulfillment of said objectives and goals are to be specified.
- Call to the first session of the agricultural round table and transfer of responsibilities to the respective provincial government in the chair of the subsequent roundtable sessions.
- Monitoring of activities and results obtained to inform the Office for the Promotion of Agricultural Round Tables at MAGAP headquarters.
- Other required activities

Stage P2

Objective: Formulation of the draft territorial plan for agrarian sector of provincial level

Responsible: Provincial government

Supporting entity: Canton government, provincial MAGAP

Results: Formulation of draf provincial territorial plan for agrarian sector.

【Activities and considerations】

Provincial governments

- Prepare the TAP assisted by the SENPLADES
- Call to the agricultural roundtable at the province and obtain the necessary information to prepare the provincial governmental agricultural TAP and the provincial MAGAP.
- Considerations: It is necessary to specify in the agricultural TAP the project operative system within the framework of the institutional cooperation.
- Prepare the provincial agricultural draft TAP and submit it to the agricultural roundtable.
- Other required activities.

Canton Governments

- Provide information and support to provincial governments in the preparation of the agricultural TAP, through the roundtable.
- Other required activities.

Provincial MAGAP

- Provide information and support to provincial governments in the preparation of the agricultural TAP, through the roundtable.
- Monitoring of activities and results obtained to inform the Office for the Promotion of Agricultural Round Tables at MAGAP headquarters.
- Other required activities.

Stage P3

Objective: Call for the agrarian forum at province level

Responsible: Provincial governments

Supporting entity: Provincial MAGAP

Results: Organization of provincial forums and approval of the TOP at provincial level

Provincial governments

- Select the basic participants according to the TAP and prepare the call to the provincial agricultural forum.
- Considerations: Participants are to be selected in the round table. However, the participation in the forum will be basically free, so the largest number possible of members in the province will be invited. Necessary preparation for the call to the forum will be made, including reservations of local accommodations, printing of the draft TAP, etc.
- Moderate the provincial agricultural forum.
- Present the provincial TAP draft to the participants, collect opinions, and achieve consensus and approval.
- **Canton Governments**
- Participate in the agricultural forum.

Provincial MAGAP

- Support the activities of the provincial governments for the call to the agricultural forum.
- Monitoring of activities and results obtained to inform the Office for the Promotion of Agricultural Round Tables at MAGAP headquarters.

Stage P4

Objective: Establishment of the entity to manage the institutional cooperation system

Responsible: Provincial governments

Supporting entities: Canton government, provincial MAGAP

Results: Establishment of the administrative entities: agrarian committee and the agrarian technical secretariat

Provincial governments

- Dissolve the provincial agricultural forum and the agricultural roundtable that were created for the support to the preparation of the agricultural TAP and create the provincial agricultural commission incorporating the former members of the provincial roundtable, in addition to the representatives of the farmers' organizations and other relevant actors.
- Create the agricultural strategic technical secretariat under the agricultural commission as an entity of technical assistance and advisement in the provincial projects of agricultural development to be implemented in the framework of the TAP and the institutional cooperation.

Canton governments

- Cooperate in the administration of the agricultural commission and the technical secretariat.

Provincial MAGAP

- Cooperate and provide human resources for the creation of the agricultural commission and the technical secretariat.
- Monitoring of activities and results obtained to inform the Office for the Promotion of Agricultural Round Tables at MAGAP headquarters.

Stage P5

Objective: Implementation of support to small-scale farmers at provincial level

Responsible: Provincial governments

Cooperation entity: Canton governments, provincial MAGAP, other institutions

Results: Execution of support to small-scale farmers in the framework of institutional cooperation

Carry out projects of support to small-scale farmers in the framework of the institutional cooperation. Provincial MAGAP will monitor activities and obtained results in order to inform the Office for the Promotion of Agricultural Roundtables at MAGAP headquarters.

4.1.6 Schedule from the structure of the Inter-institutional Linkage System to the implementation of support to small-scale farmers

The structure of the linkage system has as the objective to support the preparation of the agricultural sector plan in the Territorial Ordainment Plan within the policies of decentralization promoted by SENPLADES as well as give support in the execution of projects to provide assistance to small-scale producers smoothly and efficiently at canton and provincial levels. The present Study proposes MAGAP to reflect the agricultural sector policies in the future regional development plan, of which the Territorial Ordainment Plan is part, and in this way lead the agricultural and rural regional development. For this purpose, the linkage system has to be prepared taking into consideration the schedule of the Territorial Ordainment Plan.

SENPLADES has planned to finish the Territorial Ordainment Plans by the end of 2011, to take the necessary budgetary measures to implement said plans from 2012 on; they are to be revised yearly to proceed with the annual planning. In order to allow projects to be implemented in year 2012 based in the Territorial Ordainment Plans of cantons and provinces, they will have to be simultaneously finished in the end of 2011 (including the requirements for budgetary measures). Actually, as provincial plans have to reflect the canton plans, it is estimated that provincial plans would be finished approximately 6 months after the finalization of the canton plans.

So, it is estimated that a certain time will be necessary for canton and provincial governments to finish the elaboration of their respective plans, as well as to create a system to assure the budget, according to the schedule; so, in order to make the elaboration of plans at national level more transparent, with harmony and efficiency, Model or Sample of linkage systems required by SENPLADES have been implemented in the several regions with some institution, and the model will be good practice of elaboration of the TAP.

To start the support to small-scale farmers from 2012 on, according to the Territorial Ordainment Plan, it is necessary that MAGAP installs a preparatory unit for the agricultural roundtable for the support to the elaboration of the Territorial Ordainment Plan through the creation of an Inter-institutional Linkage System and start discussions with cantons and provinces about this system, and in this way achieve a consensus; it is recommended to finish this process by the end of 2010. The Inter-institutional Linkage System should initially be installed at provincial level to later structure the canton Inter-institutional Linkage System through conversations between the province and the cantons.

Following, the schedule of the Territorial Ordainment Plan and the creation of the Inter-institutional Linkage System for the support to small-scale farmers is shown below.

Table 4.1.9 Schedule of the creation the Inter-institutional Linkage System up to the support to small-scale farmers

Content of Activities	Schedule		2010		2011		2012		2013	
	1	2	1	2	1	2	1	2	1	2
Trend of external conditions										
National Development Plan. (2009 – 2013)										
➤ Canton TOP preparation										
➤ Provincial TAP preparation										
Nat. Plan Rural Develop.(2010 – 2013)										
➤ Rural Extension System (2010 – 2013)										
Toward institutional cooperation (MAGAP)										
MAGAP: Installation of preparatory unit for the agricultural roundtable		≡								
Discussion and consensus between MAGAP and provinces		≡								
Discussion and consensus between province and cantons		≡								
Support for the TAP preparation at canton and provincial levels			≡≡≡	≡≡≡	≡≡≡	≡≡≡	≡≡≡	≡≡≡	≡≡≡	≡≡≡
Activities of cantons (municipal government)										
Installation of roundtable		≡								
Agricultural sector TAP preparation			≡≡≡	≡≡≡						
Installation of Agricultural Forum				≡						
Creation of the administrative entity				≡						
Agreement of support from provincial government, MAGAP, among others				≡						
Implementation of support to small-scale farmers										→
Activities of provinces (provincial governments)										
Installation of roundtable				≡						
Agricultural sector TAP preparation					≡≡≡	≡≡≡				
Installation of Agricultural Forum						≡				
Creation of the administrative entity						≡				
Implementation of support to small-scale farmers										→

4.1.7 Proposal for the operative system of basic policies of support to small-scale farmers in the framework of the Inter-institutional Linkage System

In this section, the contents of the preliminary operative system for the three types of support proposed in section 2.3 “Course of the Agricultural Support Services to Small-scale Farmers”, under the Inter-institutional Linkage System are proposed. However, it should be remembered that MAGAP is currently under a reorganization process, thus the elaboration of TAPs and the final

implementation policy should be analyzed and adopted once the reorganization plan of MAGAP is finished, to be analyzed in the framework of the canton and provincial TAPs, or else within the agricultural committees to be organized within the framework; the present proposal is in this way merely an ideal situation.

(1) Routine extension service

Following the “Buen Vivir Rural” Plan, in June, the extension service for small-scale farmers was launched through the ERA’s. To that end, and as indicated in Chapter 3, MAGAP is expecting to contract approximately 1.000 facilitators and of those, around 460 will work in the Sierra region for a period of three years. At the end of this period, ERA’s facilitators are to be re-contracted as extension agents. The extension service, as a matter of routine, will attribute relevance to the facilitation role, where facilitators will provide a close and basic support to small-scale farmers in their land management and at the same time, they will be liaison agents of the support service provider organizations. It implies that said service should be provided by an entity close to the small-scale farmer. Thence, municipalities should assume this role. However, to address matters regarding technical issues that are can not be solved by the same facilitators or matters regarding the continuous education of the facilitators, the establishment of a system with the intervention of MAGAP and other relevant institutions is required. Furthermore, for the necessary financial requirements to hire facilitators (and future extension agents), contributions from MAGAP and provincial governments are necessary to compensate the limited financial capacity of the canton governments.

(2) Maintenance and improvement of soil fertility and conservation

In this issue, as a first step, awareness-raising of small-scale farmers about the necessity to maintain and improve soil fertility and conservation, through extension activities is needed. At the same time it is necessary to provide information and advisement about the feasible actions and investments for each production unit. The actions and input of the supporting service provider organizations to relatively large projects should start once the actions of the first step are finished. For this purpose, regarding the National Program of Agricultural Revolution and Productivity Increase of MAGAP, extension activities for the maintenance and improvement of soil fertility and conservation will be part of the service provided by the ERA’s. Moreover, required projects in high need zones are to be implemented through extension activities.

The extension to small-scale farmers is not a service to be finalized in the short term, continuity is mandatory. Neither it has to be categorized in a limited area; relevant techniques should be disseminated to the entire Sierra region. For this reason, it is important to go on providing the supporting service, taking into consideration the relevant issues even after the conclusion of ERA’s activities.

(3) Articulation of projects

The support to small-scale farmers is to be executed in the framework of institutional cooperation dividing and articulating responsibilities among the different institutions and organizations that are providers of supporting services.

It is important to make to the minimum the overlap or duplication of efforts through the institutional cooperation and at the same time articulate the different projects with the purpose of achieving greater impact. For this reason, agricultural strategic committees, both at cantons and provinces, should make the necessary coordination and provide information to the different institutions involved.

4.2 Plan of Internal Management Strengthening

4.2.1 Existing Internal Management System

There are no previous experiences in the System of Project Management in programs and projects implemented both by the MAGAP and the provincial governments of Chimborazo and Tungurahua. Nonetheless, in the concept concerning project management to be developed by the respective institutions, the details required for the management system proposed by the present Study are included in the formats referred to regarding development support between canton and provincial governments and in application forms to be submitted by the beneficiaries to the provincial government at the time of selecting a Project.

(1) MAGAP

Most projects and programs of MAGAP have durations of several years and are prepared at the beginning of the year in the Annual Plan following the SENPLADES form; according to the Annual Plan, activities are developed and monitored at the same time. This existing Plan serves mainly to supervise personnel expenses in the development of activities; resources to be invested and results to be achieved are not specified. See document 4.2.1 MAGAP's Format of Territorial Intervention. In May 2010, MAGAP, through Ministerial Resolution No. 074 published the indicators related to the monitoring methodology for projects and programs. In it, management of projects is to be conducted under the cycle "Plan – Implementation – Evaluation – Improvement". The Resolution points out that projects are classified in: Investment Studies (Plan), Investment (Project Implementation), Operation/Maintenance and Modifications in reference to monitoring, that are respectively accompanied by the monitoring items and indicators of the results. The Format of Territorial Intervention, needed at the time of the application, can be easily filled in; there are five (5) evaluation criteria in order to make the project evaluation simpler in regard to the impacts on the small-scale farmers and the regional economy, according to the policies of the regional government.

The current SENPLADES format is an indispensable tool to apply for budget and to report budgetary achievements. However, it does not clarify the relationship between activities and

results of investments; therefore, the theoretical evaluations at the intermediate and final stages of a project that are required in a project management format can not be carried out. On the other hand, the existing Intervention Format in the framework of the new Project Management System clearly conceives the impact on small-scale farmers and the relationship with the policies of the regional government, additionally, it can be easily filled in, so it is worth qualifying it. However, the format should be improved for it, because it does not allow a clear description of the relationship between the activities, investment and results.

(2) Chimborazo Provincial Government

Chimborazo province also relies on a project monitoring and evaluation system, but it is not established in such a way that the Project Profile is prepared first and only later, several management improvements of the monitoring evaluation are developed based on the Profile. Particularly, it does not have a Territorial Intervention Format for the project that is required at the beginning of the project. However, the PPCH project has a simple Territorial Intervention Format that goes together with the project application form to be submitted by the farmers. The contents of the same are indicated in document 4.2.3 “Profile of Projects for PPCH 2010” in which the lack of items referred to activities and the relation between investments and results is observed. The provincial monitoring system is implemented with a focus on the control of budgetary flow assuring the transparency of the projects’ expenses to provide explanations to the tax payers.

The Chimborazo provincial Territorial Intervention Form for projects is a tool used by farmers to apply for a project. The same covers the mentioned objective but is not adequate for the executing institution of the project to carry out the project management.

(3) Tungurahua Provincial Government

The Tungurahua Provincial Government promotes agricultural development in the framework of the Tungurahua Agreement. The Provincial Government is progressing in the agricultural development of the province through financial and human resources support to canton governments so there are few projects directly managed by the province. On the other hand, canton governments prepare the applications according to the pre-established format or request financial support from the provincial government for the agricultural development. This format is not prepared for each project but clearly expresses the relationship between activities, investments and results. Besides, the canton government asks the provincial government for the results of the monitoring, according to the details described in the format, each six months. The activities, investments, results and indicators of results pointed out in items 10, 11 and 12 of the application can be quite easily filled in by the applicant. See document 4.2.4. “Format of Canton Application (Province of Tungurahua)”.

The format allows the identification of the relationship between “Activities – Investment – Results” and describes the results indicators leading to later monitoring, evaluation, improvement

and modification of the project. It also counts on a mechanism that does not require special techniques prepared by applicant, comparing with the Logical Framework.

(4) SENPLADES

Government institutions of Ecuador prepare the Annual Operative Plan (AOP) according to the SENPLADES format to be used by officers in the development of their respective activities and investments. AOP activities are monitored for weekly, monthly, quarterly and yearly results. However, this format and the monitoring are directed to the “monitoring of budgetary execution” and no descriptions about the project results are requested, so that the relation between activities and investment results are not specified. In the document 4.2.2 “Format for the Territorial Intervention for provincial government projects from the MAGAP document”, the Format of the AOP Monitoring Report prepared by the Chimborazo provincial MAGAP office is shown.

On the other hand, SENPLADES has prepared the format for the application of external cooperation, requiring that the project applicant prepare a project profile according to the logical framework and the elaboration of the Monitoring Plan based in the same. To those, it is necessary to add clarifications and contents in levels similar to a regular Feasibility Study such as the economic and financial analysis of the projects and the Environmental Impact Assessment among others.

Formats required for the AOP planning and monitoring are not proper for the Project Management System. Besides, although the project profile for external cooperation is complete, it would be difficult to introduce it in the Project Management System of each institution because it demands a huge load of work and capacity for the person in charge of the preparation.

4.2.2 Proposal of a Single System

(1) Unification of the Territorial Intervention Contents

It is necessary for the Territorial Intervention Form to consider activities, investments, results and results indicators that are the contents required to carry out improvements and modifications to the project. Although in some cases evaluation both of the project goals and the superior goal are conducted, said evaluations will be presently eliminated due to difficulty to establish the respective indicators to achieve and the monitoring activities.

The project is not to be independently

- Name of the Project.
- Location of the Project.
- Number of beneficiaries.
- Objective of the Project.
- Activities
- Investments
- Results.
- Indicator of Results.
- Impacts to be generated to small-scale farmers.
- Coincidence with policies of related entities.
- Others.

Figure 4.2.1 Existing Territorial Intervention Application Form

implemented but it is to be part of the development plan or programs at national, provincial or canton levels. Therefore, the additional inclusion of items in the Territorial Intervention Form specifying the contribution to the Superior Plan will allow the clarification of the project results to achieve the superior goal. For this purpose, contents clarifying the relationship between the Territorial Intervention Form and the Superior Plan will be included.

Although not all Territorial Intervention Forms cover the contents shown in the Figure, generally the contents of forms used by each institution are similar to the one shown above. According to the Figure, items particularly necessary in the Project Management System are shown in the dotted square and this part should be included in the Territorial Intervention Forms of all institutions. The Territorial Intervention Forms of Tungurahua province have a blank space to specify the Activities – Investment– Results and Indicators of Results and the MAGAP format has a space to describe the impacts to small-scale farmers and the relation with the involved institutions' policies. Hence, both the provincial government of Tungurahua and the MAGAP Territorial Intervention Form should add the items inside the dotted line.

Chart 4.2.1 describes the Activities, Investments, Results and Indicators of Results corresponding to the Tungurahua provincial government Territorial Intervention Form and Chart 4.2.2 shows the impacts on small-scale farmers and the relation with the concerned institutions' policies, corresponding to the MAGAP Territorial Intervention Form.

Actually, the items to be added to the Territorial Intervention Forms used by each institution are the following.

MAGAP

Document 4.2.2. Add to the MAGAP Territorial Intervention Form the Activities, Investments, Results and Indicators of Results that are missing, by taking as example the material of the Tungurahua provincial government. (Chart 4.2.1).

Chimborazo Provincial Government

Document 4.2.3. Prepare a new Territorial Intervention Form concerning projects of the provincial government taking as reference the MAGAP document (Chart 4.2.2) and the document of the Tungurahua provincial government (Chart 4.2.1) referring to: Activities, Investment, Results and Indicators of Results, impacts of the project and relation with policies of other institutions, missing in the application forms submitted by farmers of PPCH at Chimborazo province.

Tungurahua Provincial Government

Document 4.2.4. Prepare a new Territorial Intervention Form for the provincial government using as reference the MAGAP document (Chart 4.2.2) in issues of: government impacts and relationship with policies of other institutions, missing in the application form of subsidies submitted by the municipal government to the Tungurahua province.

Table 4.2.1 Items to be added in the activities, investments, results
and results of indicators
(From the Tungurahua provincial government Territorial Intervention Form)

1. Expected results through projects and activities by components

Component 1:		
Result 1.1:		
Activities 1.1:		
A 1.1.1		
A 1.1.2		
A 1.1.3		
Result 2:		
Activities 1.2:		
A 1.2.1		
A 1.2.2		
Component 2:		
Result 2.1:		
Activities 2.1:		
A 2.1.1		
A 2.1.2		
A 2.1.3		
Result 2.2:		
Activities 2.2:		
A 2.2.1		
A 2.2.2		

2. Indicators of achieved result by Component

Component 1.

Result 1.1		
Indicator 1.1.1		
Indicator 1.1.2		
Indicator 1.1.3		
Result 1.2		
Indicator 1.2.1		
Indicator 1.2.2		

Component 2.

Result 2.1		
Indicator 2.1.1		
Indicator 2.1.2		
Indicator 2.1.3		
Result 2		
Indicator 2.2.1		
Indicator 2.2.2		

3. Budgetary Items

Schedule Results/ Activities	1st. quarter	2d. quarter	3rd. quarter	4th. quarter	Municipality***			Honorable Council of Tungurahua Province -CPPT		
					Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Component 1										
Result 1.1										
A 1.1.1	xxxx	xxxx	xxxx	xxxx						
A 1.1.2	xxxx				xxxx					
A 1.1.3	xxxx							Xxxx		
A 1.1.4	xxxx				xxxx					
Result 1.2										
A 1.2.1	xxxx				xxxx			Xxxx		
A 1.2.2		xxxx							xxxx	
Result 1.3										
A 1.3.1		xxxx				xxxx				
A 1.3.2		xxxx							xxxx	
Component 2										
Result 2.1										
A 2.1.1			xxxx						xxxx	
A 2.1.2		xxxx				xxxx				
Result 2.2										
A 2.2.1	xxxx	xxxx						Xxxx	xxxx	
A 2.2.2		xxxx							xxxx	xxxx

Table 4.2.2 Chart to include the impact on small-scale farmers and relationship with other concerned institutions (MAGAP Territorial Intervention Form)

Analysis of Programs or Projects					
Impacts on beneficiaries and job generation	Excellent	Good	Regular	Bad	Nonexistent
Generation of new job opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvement in rural workers income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvement in the consumption level of rural population	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvement in the consumption level of urban population	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generation of job opportunities for women	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvement of productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvement in organizational capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Effect of project replication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scope and Location of the Program or Project	Excellent	Good	Regular	Bad	Nonexistent
Attention to rural groups located in poverty areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attention to small-scale and micro producers and communities on the Coast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attention to population and nationalities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attention to legally established groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attention to informal groups of agricultural producers and/or manual fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relation with the local development plan	Excellent	Good	Regular	Bad	Nonexistent
Planning zones (SENPLADES)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provincial Councils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Municipalities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parroquia boards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supporting institutions / NGOs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demand-Supply Analysis	Excellent	Good	Regular	Bad	Nonexistent
Availability of human capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of organizational capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adequate and sustainable use of local natural resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demand of goods and services referent to basic needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Level of satisfaction generated by goods and services in the unsatisfied demand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The quality of goods and services generated by the project are equal to the existent or superior?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(2) Evaluation Form

To this day, the Evaluation Form has not been implemented either by the provincial government or the MAGAP. Evaluation is to be conducted based on the monitoring results; such will be carried out from the results and results indicators of the project described in the Territorial Intervention Form. Projects will be evaluated according to the criteria of Relevance, Efficiency, Effectiveness, Impact and Sustainability. A sample of the project evaluation form and the basic concept of the evaluation criteria are shown below.

Table 4.2.3 A sample of the project evaluation form and the basic concept of the evaluation criteria

Date of elaboration: ___/___/___
 Date of approval: ___/___/___

Sample of Evaluation Form

Supporting Institution Name	Institution A		
Name of the Project	Project of Irrigation Infrastructure Improvement in Communities		
Scope of intervention	A Municipality	B Parroquia	C Community
Project Profile	<p>Presently cultivation lots are in a situation where volume of production depends on climate due to lack of irrigation water. This generates inequities in crop production for self-consumption; at the same time it makes it impossible to produce income crops of high production cost. The Project intends to improve said situation, achieve the productive strengthening of crops for self-consumption and at the same time improve the income of farmers. Roughly, it will be an open channel through which irrigation water will be conveyed from the spring located 8 km from the community to be stored in a tank to be installed near the community and then to be distributed to each lot through conduits for irrigation by sprinklers. Simultaneously, dissemination of vegetable cultivation techniques will be carried out.</p>		
Duration of the Project	Start	May 2011	Finalization December 2011
Cost of the Project	USD 25,000	Amount in charge of the population	USD5,000
Involved Institutions	Institution B		
Role of the involved institutions	Institution B will be in charge of the dissemination of vegetable cultivation techniques.		
Name of the agricultural sub-sector	Irrigation	Technological dissemination	

Contents of the Project Evaluation

Criteria of Evaluation	Evaluation at the time of planning	Evaluation at the end of the Project	Observations to evaluation at the end of the Project
Relevance	<ul style="list-style-type: none"> Promotes “increase of productivity”, “strengthening of competitiveness” and “improvement of the irrigation system” pointed out as strategies of the Agricultural Policy 2007-2020. Agrees with the Guidelines of Agricultural Development of Municipality A in the framework of the provincial agricultural development strategy. The present project is a development launched under request of the population, organizing communitarian work for the plan elaboration through which the Irrigation Cooperative was established and later, the beneficiaries' contributions were approved. 	<p>No changes in the relation between the policies and the present Project have been observed.</p>	
Efficiency	<ul style="list-style-type: none"> Achievement of results. Applies to the production goal by crop established by MAGAP: 3,9t/ha in maize and 20t/ha in potato. Irrigation area: 100ha Duration of construction works for irrigation infrastructure: 3.5 months Construction cost of irrigation infrastructure: USD 20,000 Cost of technology transfer (administration of infrastructure, cultivation techniques): USD5,000 	<ul style="list-style-type: none"> Achievement of results: Maize 3,3t/ha, potato 15t/ha. Irrigation area: 100ha Duration of construction works for irrigation infrastructure: 4.0 months Construction cost of irrigation infrastructure: USD 18,000 Cost of technology transfer: USD5,000 	<ul style="list-style-type: none"> Achievement of results. Irrigation area has achieved the established goal, not the same in the case of productivity; estimated causes are problems with soil and crop variety. Works were not finished at the established period due to road inaccessibility because of the rain. During the Assembly of the Irrigation Cooperative, it was decided that beneficiaries would contribute to the total cost of sprinkler purchase with 2,000 dollars.
Effectiveness	<p>Goals of the Project</p> <p>Family expenses for self-consumption crops.</p> <p>Qualitative information.</p>	<ul style="list-style-type: none"> Goals of the Project Family expenses for self-consumption crops were reduced. Increase of income 200 dollars/year through the sales of agricultural products. 	<ul style="list-style-type: none"> Goals of the Project In the creation of the Irrigation Cooperative, beneficiaries were requested to keep household accounts but out of 60 families, only 20 have attended to this request. Besides, no farmer kept accounts before the start of the Project, so it was impossible to carry out a quantitative evaluation in respect to the previous year. Qualitative Information. The increase of agriculture crop production thanks to the intervention of the support institution has generated expectations among small-scale farmers in the application of new farming technologies in the community. Regarding agricultural product commercialization, communities carried out the collective introduction of products in the market.
Impact		<ul style="list-style-type: none"> Impacts on society. 	<ul style="list-style-type: none"> In the community there are some five lots still not benefited by irrigation. Although said farmers participated in the technological advisement,

Criteria of Evaluation	Evaluation at the time of planning	Evaluation at the end of the Project	Observations to evaluation at the end of the Project
Sustainability		<ul style="list-style-type: none"> Impacts on the environment. Technical aspect Institutional aspect 	<p>productivity both in maize and potatoes was small compared to the beneficiary farmers generating an income gap.</p> <ul style="list-style-type: none"> The Irrigation infrastructure system is by gravity not requiring complicated maintenance and can be easily maintained by the Irrigation Cooperative. Besides, according to the system, the supporting institution provides assistance in case of infrastructure damage. Presently, hydraulic expenses for infrastructure maintenance are being satisfactorily collected, with exception of some farmers that have delayed the payment. It is necessary that support institutions go on periodically assisting the institutional management of the irrigation cooperative.

Evaluation Review

Lessons, proposals and future guidelines Person in charge	<ul style="list-style-type: none"> It is necessary to apply some corrective measures to mitigate the economic gap generated within the community. The execution period of the work should be established with more length than the one first considered, due to factors such as natural disasters. In some cases, good coordination with Institution B was not achieved by lack of communication with the same. It is necessary to create a system to allow closer contact. The contribution assumed by the beneficiaries in the purchase of sprinklers was defined after discussions with the Irrigation Cooperative. It has allowed farmers to take more care handling the infrastructure and equipment, compared to other zones.
Lessons, proposals and future guidelines Administrator	<ul style="list-style-type: none"> Concerning the economic gap within the Community, mitigation measures will be applied, by discussing with the Irrigation Cooperative the inclusion of communal expenses to cover the hydraulic expenses, although it would be in a small measure. Continuity of technical assistance is necessary for the present zone in order to bring maize and potatoes close to the initial production goal. For the following year, the introduction of soil improvement and introduction of improved varieties are planned, applying the ERA methodology. Concerning introduction of improved varieties, the participation of supporting institution D in the present Project is considered. Visits to assist the Irrigation Cooperative will continue for 3 months approximately. For the project implementation it is necessary to coordinate with the Irrigation Cooperative a strict Agreement regarding the distribution of expenses, revising the present agreement model.

Prepared by : XXX YYY

Approved by : AAA ZZZZ

1) Relevance

The Development Project should be planned and implemented as part of a broader framework, such as the Policies and Measures for Development, and as a tool to answer the beneficiaries needs. The relevance of the Project should be evaluated from this concept. Following, some questions for the evaluation of relevance are shown.

At National Policy level: Agreement between the Project goal and the National Plan of Development.

At Regional Policy level: Agreement between the Project goal and the development plans promoted by the municipal government and aimed sub-sectors.

Necessities: Agreement between the Project goal and the needs of the population.

2) Efficiency

The Project is considered efficient when results (output) previously considered are obtained by a quantity of investment equal to or smaller than the programmed amount. In the case of the present Project, investment is to be measured for the duration of the Project execution (months) and Project expenses. In case there is a large difference between the programmed investment and the execution of the same, it is important to clarify the reasons that cause it and also learn from it to apply those lessons in the following project. Following, some criteria applied for the evaluation of efficiency are mentioned.

Results: achievement of the considered results.

Duration: Actual duration in respect to the initial plan.

Investment: Actual investment volume compared to the initial plan.

3) Effectiveness

Project effectiveness is considered significant when the project goal is achieved by the obtained results; that is, when the planned value (goal) is achieved. The level of goal achievement is firstly studied by a quantitative analysis; although the qualitative analysis is equally important to identify the beneficiaries' circumstances and opinions hidden behind the results of the quantitative study. Some evaluation criteria about effectiveness are the following.

Results of operational effectiveness indicators: achievement level of the Project goal planned value.

Qualitative information: positive changes generated by the Project such as the level of satisfaction of users and beneficiaries in relation to the obtained results, and factors that promoted or impeded the goal achievement

4) Impact

Clarify the positive or negative impacts generated by the Project towards the society, economy and natural environment.

- Socioeconomic Impact: impacts toward economic development; positive and negative changes in the lives of the persons affected by the Project (includes beneficiaries and entities affected by land acquisition and/or resettlement of population); in case of negative impacts, the adequacy of the mitigation measures, among other things.
- Environmental Impacts: impacts generated by the Project affecting the environment and the adequacy of the mitigation measures for the negative impacts, etc.

5) Sustainability

A Project is considered highly sustainable if the obtained result (output) goes on achieving the project goal in the medium and long terms. In general, the sustainability evaluation is focused on the institutional position, capacity and development of operation and maintenance (O&M) activities of the institution that operates and maintains the results. Specifically speaking, the farmers' organizations and the supporting institution are the objects of the present Study. Following, some criteria for the evaluation of sustainability are mentioned.

- Technical aspect: technical capacity of the farmers' organization (including training information and preparation of the operation and maintenance manual) and follow up system of the supporting institution.
- Institutional aspect: situation of the follow up conducted by the farmers' organization and the supporting institution regarding the Project.

4.2.3 Execution of the Internal Management System

The Project Management System is constituted of: preparation of the Territorial Intervention Form, monitoring of results indicators described in the same, evaluation of monitoring results and the feedback of said evaluation to the next Project. In the framework of this cycle, those responsible for the elaboration of the Territorial Intervention Form and following processes are shown below. Also, the person responsible for the Project Management Systems as a whole, in the case of MAGAP is the Planning Director of the provincial Office, and in the provincial government the responsible person is the Director of the Project Implementation Department.

Table 4.2.4 Implementation System of Internal Management

Phase	Content	Person in charge	Approval
Planning	Elaboration of Territorial Intervention Form.	Person in charge of the Project	Person responsible for the Project (Ex.: Planning director of the MAGAP provincial office).
Monitoring	Realization of monitoring, periodic information	Person in charge of the Project	Person responsible for the Project
Evaluation	Elaboration of the Evaluation Form.	Person in charge of the Project	Person responsible for the Project
Modification and Improvement	Revision of next project's content.	Person in charge of the Project	Person responsible for the Development (Ex.: Director of the MAGAP provincial office).

4.2.4 Development of the Internal Management System

As proposed in the present Study Report, if from now on projects are to be implemented under the system of co-management by entities to support small-scale farmers, the alignment of the Territorial Intervention Form of the Internal Management System and the Project evaluation form proposed in the present Project will be important to form an “institutional communication system”.

The Project Management System is a system to be modified efficiently and effectively by the operator, according to the management progress. In the case of the present Project for instance, the application of the Logical Framework was put behind because of technical problem and a lot of that represents to the elaborator. But the implementation of the Logical Framework is indispensable to achieve a more advanced Project Management System. Besides, the projects to support small-scale farmers are to be carried out based on the TAP where the agricultural development goals at canton and provincial levels are put into evidence. Moreover, progress in the organizational re-design and decentralization suppose future changes in the circumstances surrounding small-scale farmers, a fact that also creates the need to modify the Project Management System, adjusting it to the circumstances.

4.3 Plan of Capacity Strengthening of Agricultural and Rural Development Facilitators

4.3.1 Basic guidelines for capacity strengthening

MAGAP should implement training projects needed to strengthen the capacity of ERA's facilitators who provide direct assistance to producers (including regional development technicians of the provincial Office). Capacity strengthening of facilitators should be balanced in three aspects, namely the specialty of the beneficiaries, the coordination and the facilitation directed to the effective implementation of the “Buen Vivir Rural” Program. It is particularly important to strengthen the facilitation capacity directed to the implementation of participative type agricultural and rural development projects. Moreover, the same should be a program to allow the participation, in equal conditions, of those responsible for the rural and agricultural development including the

provincial and municipal government and NGOs, among other entities, under MAGAP's initiative, in order to promote decentralization and a territorial approach.

4.3.2 Proposal for the Capacity Strengthening System

Continuous training is to be conducted in order to allow persons in charge of communitarian development to acquire the necessary abilities. A training program of new facilitators of ERA's establishes as first phase a period up to year 2013 of "Buen Vivir Rural". Additionally, self-discipline, on the job training (OJT) and regional training are to be implemented to strengthen practical training. For on-the job-training (OJT), technicians of regional development of the MAGAP provincial office will orient ERA's facilitators. Regional training should consist of "building the agricultural and rural development facilitators net" and the "meetings of agricultural and rural development facilitators" and it is assumed that all persons in charge of rural development in the institutions participating in the agricultural forum at provincial and municipal level proposed in item 4.1.1 should attend it.

4.3.3 Implementation System

MAGAP should create a Unit responsible for the elaboration of the detailed program for development facilitators' capacity strengthening in the Secretariat to prepare the establishment and operation of the Roundtable. Once the detailed program is prepared and the executing entity with the respective proper budget is defined, the workers' capacity development program is to be transferred to a proper project sub-secretariat. After the coordination in the regional sub-secretariat is finished, the MAGAP provincial office is to be in charge of the program implementation with the cooperation of the entities under MAGAP, the provincial government, municipality governments, universities and education entities, farmers' organizations, NGOs, among others.

4.3.4 Generalities of Individual Programs

(1) Training for the formation of rural and agricultural development facilitators

Objective:

Implementation of continuous education (planned) directed to the capacity strengthening of rural and agricultural development facilitators, particularly MAGAP's ERA's facilitators, who work in the Sierra Zone and are dedicated to the support of small-scale farmers.

Responsible Entity:

MAGAP headquarters

Executing Entity:

MAGAP (Regional Sub-secretariat, Provincial Office)

Coordination Entity:

MAGAP Provincial Office, provincial government, municipal government.

Entities and target population:

Facilitators of MAGAP's ERA's (including those responsible in regional development of MAGAP, as necessary), rural and agricultural development facilitators of provinces and municipalities, and other stakeholders (NGOs, Parroquia boards, educational and research entities).

Procedures:

- 1) The MAGAP headquarters' department in charge prepares a staggered program (regular and continuous training) as a continuation of the introductory training (mainly related to PRA and ECA) carried out by MAGAP and directed to ERA' facilitators ³⁷.
- 2) Regional Sub-secretariat of MAGAP together with the provincial Offices prepare a training and formation program by province for the 2010-2013 period (period of the "Buen Vivir Program").
- 3) Present the training program to the provincial and municipality governments to call interested parties (rural and agricultural development facilitators) to participate in the training and provide information to other concerned institutions (like NGOs) in the province.
- 4) Prepare a detailed annual plan and implement the training and also carry out an Evaluation Meeting at each stage with the participation of the training coordinators, trainers and participants.
- 5) Annual review of the training program

Necessary input: Training expenses (rental of space, per diem of participants, educational material cost), fees and per diem of trainers.

Table 4.3.1 Sample of Facilitators Training Program

Issues to be learned and understood	Basic Capacity (Field experience up to 2 years)		Practical Capacity (Field experience up to 12 years)	
	Class	Practice	Class	Practice
Specific Capacity	Introduction to agriculture and animal husbandry	Preparation of a sample cultivation schedule	Technical training based in each field (Ex. Labor saving techniques, high quality articles production, gender)	Practical training based in each field (Ex, results of experiences evaluation, sales strategies, reactivation plan)
	Environmental management	Elaboration of natural resources map		
	Rural development	SWOT, PRA, ECA		
Capacity of coordination	Policies	Elaboration of the Annual Operative Plan (AOP)	Elaboration of the future vision of the community	
	Dissemination methods	PCM problem analysis, practical workshops	Resolution of problems with dissemination methodology, logical framework	
Capacity of facilitation	Facilitation from an improvement approach	Improve dialogue capacity with conversation practices	Improve capacity to solve problems through dialogue practices	

³⁷ The present Report refers to the formation and training of facilitators who are going to accumulate experience, the better qualified are to be promoted to trainers. For that, another training program is required.

(2) Agricultural and Rural Development Facilitators Net

Objective: Preparation and use of a database necessary for the exchange of techniques and information among the agricultural and rural development facilitators at the provincial level aiming towards activities of support to an efficient and effective communitarian development.

Responsible Entity:

MAGAP headquarters

Executing Entity:

MAGAP provincial Office

Coordination Entity

MAGAP provincial Office, provincial council, representatives of supporting institutions to small-scale farmers (NGOs, Foundations, Universities, etc.) and representatives of the private sector (Cooperatives, Companies, etc.)

Target Technicians:

All facilitators, technicians and extension agents related to the agricultural and rural development (including the private sector)³⁸, at community level in the province.

Procedures

- 1) List of facilitators: name, e-mail address, scope of activities, intervention zone, name of the project, and representing organization.
- 2) Elaboration of the database and opening to the registered persons: It is necessary to consider the protection of personal information at the time of preparing the database
- 3) Administration and maintenance of the database: Voluntary update of registered persons and general updating twice a year.

Necessary input:

Assignment of a coordinator, systems engineer and one person responsible for the database management, installation and maintenance of the web homepage.

Expected results

- 1) Contact with similar projects and activities concerning location and contents allows the exchange of information.
- 2) In case the project or activities are executed in the same community or micro-watershed, mutual coordination will allow more efficient and effective implementation.
- 3) The use of the database allows the identification of the required professionals (trainers) or request the collaboration of the same, if they are required, etc.
- 4) The 3 previous results will directly contribute to the capacity strengthening of the persons in charge.

³⁸ MAGAP province office, entities under the MAGAP, provincial council, municipalities, Parish Boards, NGOs, associations, foundations, cooperatives, universities, etc.

(3) Meeting of agricultural and rural development facilitators in the province

Objective:

Provide a space for the exchange of updated information about regional development and technical information as well as the exchange of information and opinions in order to strengthen practical capacity of agricultural and rural development facilitators.

Responsible Entity:

MAGAP provincial office

Coordinator Entity:

MAGAP (Provincial office, other entities), provincial government, representatives of concerned entities (NGO, Foundations, Universities, etc.) , and representatives of private sector (Cooperatives, Companies, etc.)

Target entities:

All institutions and persons involved in communitarian development in the province

Methodology:

- 1) Elaboration of the event program: The representative of the event coordination entity establishes the date, location and program of the meeting
- 2) Invitation to participants and speakers: Prepare a procedure for the meeting including the necessary thematic tables (issue and number) and send invitations to the concerned entities, at the same time invite speakers and participants to the Tables.
- 3) Conduct the Meeting (General meeting, Thematic tables, group meetings): In the General meeting an expert will speak about common interest issues to be later discussed, the Thematic table for the expositions of specific themes and discussions and the Group Meeting for free discussion about issues proposed by the participants. Each meeting will have a coordinator who will conduct and conclude the same. In the General Meeting of Conclusions, the General Meeting, Thematic table and Group meetings, conclusions will be reported; also the date and location of the next event will be fixed.
- 4) Digitalization of the presentation contents and distribution to the participants: all contents and main discussions both of the General meeting as the Thematic Tables are to be digitalized and distributed to the participants.

Example of expositions in the Thematic Table

- 1) New techniques to be used in the extension: Presentation of agricultural techniques to be applied by small-scale farmers. These will be officially presented in the Facilitators Meeting as “New techniques for the extension promotion”, with the approval of the entities in charge of the investigation and governmental entities.
- 2) Presentation of successful projects: Presentation of successful project activities by the facilitator in charge. Said projects are highly applicable in zones with similar socioeconomic environment.

- 3) Development, validation and presentation of techniques in situ: As it consists in the presentation of “development, validation and presentation” activities carried out in situ, said results can be immediately used or replicated in other projects

Expected results

- 1) The obtaining of new techniques related to the agricultural and rural development of the region promotes the individual capacity strengthening of individuals, and at the same time allows them to reflect those techniques in the improvement of the project quality under his responsibility.
- 2) The exchange of experiences and discussions with other facilitators in charge of similar activities allow the participants to find solutions to the existing problems.
- 3) Technical information acquired during the meetings can be directly applied in the respective jobs for they are reports of activities and meeting with actors rooted in the region.

Necessary input:

Rental of the venue, expenses of the meeting and coffee break (not necessary in case participation cost is charged), expenses for the elaboration of digital documents and transportation costs (as necessary).

Chapter 5

Technology Required for Small Scale Farmers in poverty

Chapter 5 Technology required for small scale farmers in poverty

5.1 Plan of the institutional linkage system for small scale farmers and required technology for small scale farmers

The coordination system proposed in Chapter 4, “Plan of Reorganization of the Agricultural Supporting Service”, is based on the framework of territorial development. This system, aimed to reduce poverty should be institutionalized in the rural development of Ecuador at national level. On the other hand, the problem of poverty, especially in the rural areas of the Sierra region is aggravating; therefore it is necessary to establish the coordination system proposed for this region and in order to obtain visible positive results, determine the technology required by small scale farmers and propose a model for a development project based on said technology, as soon as possible.

The efforts to increase income to fight against poverty start, in most cases, by identifying highly commercial crops, studying the trading channels, legalize organizations and strengthen them. However, in the Sierra region, before efforts to increase income, the four problems described in Chapter 2, namely, “destruction of the sustainable use of soil”, “loss of native crops and genetic deterioration”, “difficulty in trading surplus crops” and “delay in the establishment of agricultural organizations as base for the creation of the value chain”, which present a risk of destroying the productive and social foundation of the rural community should be firstly solved.

In this Chapter, besides the technology to increase income, the technology related to the production of subsistence crops and soil conservation are considered, for these elements are the sustaining pillars of the rural community, its agricultural development and production. The technology required by small scale farmers is precisely the one that allows the increase of income based on stable production of subsistence crops.

5.2 Evaluation of the agricultural development directed to small scale farmers in poverty

5.2.1 Priority issues of the agricultural sector development plan

Based on the new National Development Plan “Buen Vivir: 2009-2013”, MAGAP issued the Sector Plan “Buen Vivir Rural” in October 2009 focused in the “familiar farming as motor for development with environmental responsibility” centering on MAGAP interventions with small scale farmers with the objective of diversifying agriculture, animal husbandry and aquaculture to “increase the income of producers and food self sufficiency and in this way contribute to the good living of rural and coastal communities”.

5.2.2 Importance in the productivity increase of basic crops

According to the results of the survey carried out, around half of small scale farmers depend on

non-agrarian sector income (Table 5.2.1.) and as there are no job opportunities in the surroundings, most of the income is from money remittance generated by relatives who migrated to other areas of the country. From the property area viewpoint, (1.27 ha in average), the existing socioeconomic environment does not allow survival without income generated by migration, so the only way to increase income is by increasing the production of crops for self-consumption using the familiar labor force to assure self-supply; this will also augment the sales of the surplus production and so obtain better income.

Around half of producers support themselves with income from agriculture but it corresponds to an amount close to US\$ 215 dollars, similar to the income of producers receiving non agricultural income, who are equally in a situation of poverty.³⁹ (Table 5.2.1). This group has more land than the group that depends on non-agricultural income and migration is not so frequent; therefore, possibilities of increasing income with agricultural activities are higher. However, while major changes do not occur in the socioeconomic environment of the communities, the way to increase income equally will depend on the commercialization of agricultural production surplus of basic subsistence crops.

Table 5.2.1 Characteristics of the surveyed production units according to the producers' income and gender

Classification		% .of families	Total Area	Monthly income (US\$)					
				Agriculture	Animal farming	Internal Migration	Overseas Migration	Other Income	Total Income
Income source	Mainly agriculture	47%	2.74	119.7	66.0	24.8	3.0	2.4	215.9
	Mainly migration	53%	1.27	23.2	15.0	163.4	5.9	12.8	220.4
Producer	Male	60%	2.33	78.2	41.2	101.7	5.7	6.2	233.0
	Female	40%	1.40	54.0	35.8	93.1	2.7	10.6	196.2
Average		100%	68.6	39.0	98.2	4.5	70.5	218.3	68.6

Source: Results of the survey of 1192 families in the provinces of Cotopaxi, Tungurahua, Bolívar and Chimborazo by the Study Team in August 2009

As explained in Chapter 2 “Issues of agricultural management by small scale farmers” in the Sierra region, the 1) Collapse of the sustainable use of soil and 2) Loss of native crops and genetic transformations are demonstrations of the degrading conditions of the basic crops causing low production and productivity. In order to slow or reverse the increase of migration related to the collapse of rural society, the increase of basic crops productivity through soil improvement, seeds and cultivation methods together with the improvement of the environmental conditions of the region is urgent.

5.2.3 Introduction of intensive production management for commercialization as a triggering factor

Figure 5.2.1 shows the situation of use of soil in the four Sierra provinces on farms smaller than 2 ha. In Bolívar, Chimborazo and Cotopaxi provinces, cultivation areas for transitory crops are the majority (64-70%) but are considerably smaller in Tungurahua province (35%) and areas of

³⁹ La línea de pobreza de consumo regional de la sierra en abril de 2010 era de US\$541.6/mes, el gasto con alimentos era de US\$189.71/mes

permanent crops and cultivated pasture are relatively larger compared to the other provinces, 12% and 13% respectively. In Tungurahua province, transitory crops (basic crops) have been replaced by the introduction of commercial crops such as fruits. The percentage of areas with cultivated pasture is also high and dairy farming is quite active; the survey result shows much higher animal farming income compared to other provinces. (Figure 5.2.2).

In Tungurahua province, transitory crop production for self-consumption has been replaced by income generating products, such as fruits, vegetables and dairy production, even in small production areas, through the intensive agricultural management that has been disseminated to the small scale farmers, allowing the increase of income. On the other hand, the introduction of an intensive agricultural system requires the establishment of some conditions such as the organization of the productive base, strengthening of associations, improvement of production techniques and assurance with marketing. As analyzed in Chapter 2, the introduction of intensive agricultural production

directed to the market is the key to solve the agricultural problems pointed out in the Sierra region that are the stumbling blocks to proper commercialization of production surplus and cause the delay in the strengthening of producers associations, the foundation of the value chain structure. The associated intensive agriculture opens perspectives to develop monetized agricultural management. From the profitability viewpoint, specialization in intensive agriculture may be the final goal for small scale farmers to achieve increased income.

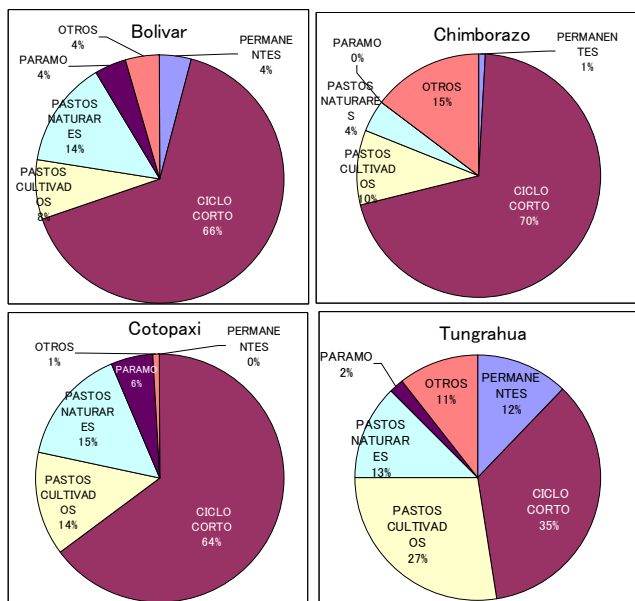


Figure 5.2.1 Land Use less than 2 ha

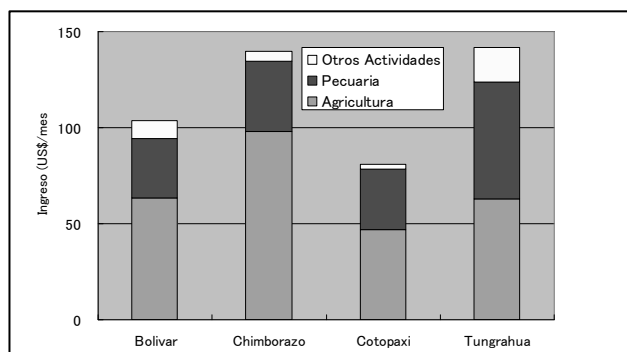


Figure 5.2.2 Detailed Farmer's Income in 4 Province in the Sierra Region

5.2.4 Introduction and establishment of tradable crops is easy to be applied with little input

Around 40% of small properties in the Sierra region are administered mainly by women peasants due to the effects of migration; they own smaller areas and both agricultural and non-agricultural incomes are lower than properties administered by men. The poorest layer of population in the Sierra is constituted by these families whose agricultural administration is in the women's hands.

Cultivation areas are limited and there is not enough labor force; so, support to these families in the agricultural sector consists of the introduction of tradable crops for self-consumption and also for the purpose of trading the surplus in local markets and in their own community, which could be feasible with low input, including the basic crops mentioned in 2). Presently, besides the basic crops, cuy, poultry, confined cattle for dairy, vegetable gardens, and home food processing are being produced; even so, support for tradable production with low input (technical improvement, associations, and marketing) still is an important issue to increase income of small scale farmers in poverty within a very narrow social environment.

5.2.5 Path to be followed by small scale farmers towards poverty reduction

Small scale farmers produce transitory crops basically for self-consumption and migrate to other zones or carry out work in their communities to obtain some income and consequently maintain their living. In some zones there are cases that the whole family goes to work away from home, leaving agricultural activities behind. It is difficult for small scale farmers to maintain their living with integrated management of the traditional farming practices and animal husbandary, and it is also difficult to continuously maintain land use due to degradation of soil; therefore, development models to allow small scale farmers to leave behind their conditions of poverty need to be formulated. For the development of small scale farmers in poverty the following development models are proposed based on the current arguments.

- Model 1: Mainly Production of food for self-consumption+ monetary income (paid jobs, diversification of low input crops)
- Model 2: Mainly commercial products (intensive agriculture) + production for self-consumption
- Model 3: Commercial products (intensive agriculture)
- Model 4: Resettlement (new frontiers)

Model 1 is recommended for cases where there are many restrictions (production infrastructure, access to the market, labor force, etc.). One part of the production is directed to the market but income depends basically on money remittance from outside the community or on work in the same community, and additionally, low input commercial products are introduced as a way to obtain income. In this model it is important to increase and stabilize production for self-consumption, and so assure basic necessities. It is applicable to a great part of the families in which women are mainly responsible for the agricultural production.

Model 2 is already being developed by several supporting entities. It is based on the introduction of infrastructure for intensive farming (irrigation facilities, greenhouses, collective collection, roads, etc.), the introduction of technical agriculture, associations, marketing, etc. In this case it is also important to maintain the production of basic crops for self-consumption.

In model 3 agriculture production is not for self-consumption; it is specialized in intensive production directed to the market and food has to be obtained elsewhere.

Model 4 is applied to cases where the production environment is unfavorable and cultivation areas are too small, additionally, there are limitations to obtain cash income; so, resettlement in new frontiers would be an option. This is an important development strategy to avoid the shrinkage of smallholdings due to property transfer by inheritance.

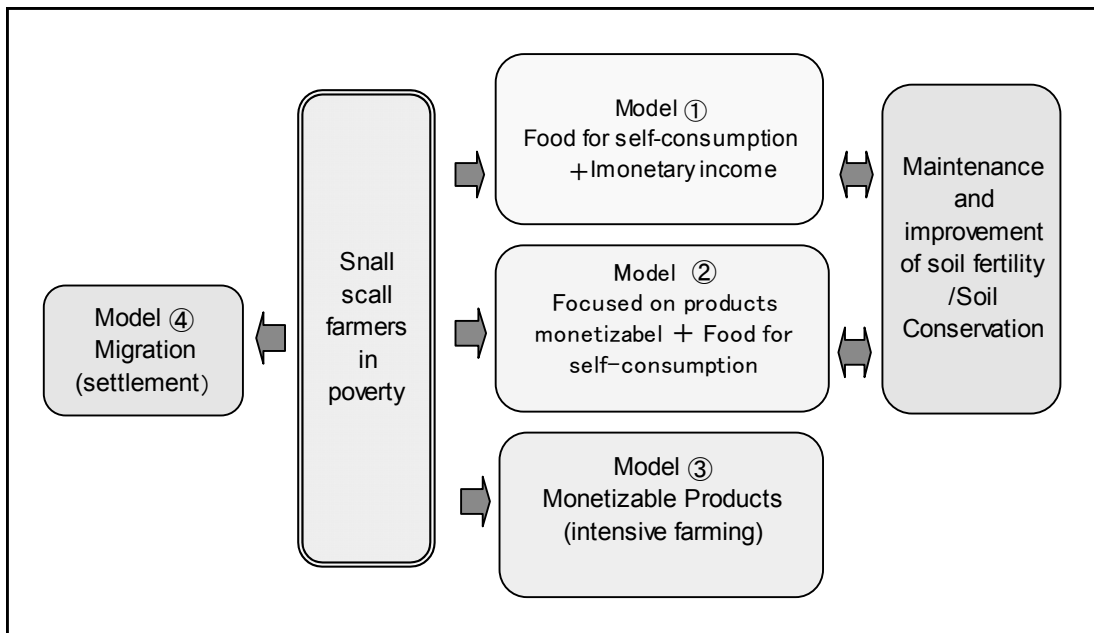


Figure 5.2.3 Development Model for Small Scale Farmers in Poverty

The choice of development model for the group of small producers that focus would change according to social and natural conditions, the existence or otherwise of development support and according to the strategy itself, and can not be determined only by the size of terrain or altitude of the farm. Specifically, we determine in a comprehensive manner by environmental factors such as land, market access, the bases for production, labor, and organization of production, etc. strategies and support organizations for development (Table 5.2.2).

Table.5.2.2. Factors to be considered at the time of the selection of a development model for poor small scale farmers in the Sierra region

Factors	Theme	Reference indicators		
		bigger	← Difficulty of Development →	smaller
Land	Size of arable land of farmer	<0.5 ha	0.5-2 ha	2-5 ha
	Inclination	High Slope (>20%)	Slope (5-20%)	flat / Moderate Slope (0-5%)
	Fertility of Soil	There is degradation and/or erosion	Normal	Fertile
	Altitude	>3.600 m	2,500-3,600 m	2,000-2,500 m
Access to market	Market possible go and come back in half a day	Market inside the parroquial area	Market inside the cantonal area	Market in the provincial capital
Base of production	Community road	Road not passable for vehicles	Vehicular passable road	Paved road to the main road
	Installation of irrigation	No exists	Exists partially	Exists
	Collection center / Processing facility	No exists / No exists	Exists / No exists	Exists / Exists
Manpower	No. of family members who can work in the field	No person can work full time	1 to 2 persons	More than 3 persons
	Migration for family	More than 2 persons	One person	Any person
Productive organization	Membership Organizations and their levels	Not belong to any organization	Organization belongs to first class	Organization belongs to the second and more upper class
Development support	Permanent extension	No exists	There is, but not periodically	There are periodically
	Programs / Project	No exists	Technology transfer, association, targeted support to some of the production chain.	Full support of the production chain (including the construction of infrastructure)

5.2.6 Issues to be considered in the support to small scale farmers in the reduction of poverty

Model 3 presents an established format and Model 4 is an intervention outside the frame of the supporting system to small scale farmers. Of the 4 development models, Models 1 and 2 are in the framework of basic interventions directed to poverty reduction.

Activities of models 1 and 2 can be grouped into 3 types that are “stable production of food for self-consumption and increase of productivity”, “introduction and establishment of commercial products feasible with minimum input” and “introduction and establishment of commercial products to require some amount of input that will be promoted by community or region level development”.

5.3 Course of the support to small scale farmers

Along with the progress of the development model described in 5.2.5, the course of support required for small scale farmers is as follows.

- 1) **Stable production of food for self-consumption and increase of productivity:** This considers production sustainability and increase in a system of traditional agricultural production with rotation of crops and animal husbandry that are collapsing; and sustainable

management of soil fertility, introduction of improved seeds (participative type production, certified seeds), soil conservation and other adequate techniques as support for the rotation system are proposed. This issue is related to the problem of food self sufficiency, with the regional agro-economic environment and also with the integral management of micro-watersheds and landholdings.

- 2) **Introduction and establishment of traditional type commercial agriculture:** Under unfavorable conditions such as lack of irrigation facilities, difficulty of access to markets and lack of labor force, an agricultural model with the assumption of improving nutritional conditions of families and at the same time commercializing products in nearby markets and in the same parroquia is aimed for. It is directed mainly to zones with limitations related to family labor force due to migration. Also in this case, support for the introduction of the proper technology, promotion of associations and marketing are required.
- 3) **Introduction and establishment of commercial products to require some amount of input promoted by community regional development:** Development projects to require some amount of input: it leads towards 1) Agricultural technological innovation 2) associations and 3) corporate management. The target for goal is not only the local market but also the national and international markets.

5.4 Gender and Inter-cultural approach

(1) Antecedents

Women represent 31% of the agricultural sector labor force in Ecuador. In the Sierra region, women are heads of families in an average of 26% homes among small scale farmers. Moreover, even when men are heads of families many migrate either to other parts of the country temporarily during the months of May to July or permanently to foreign countries; this situation has lead women to assume an even more important role in rural life. However, the rights to access public services by women, especially in productive areas, have not been respected in an equitable manner compared to men and they have to face many more obstacles to access services such as land, training, irrigation and micro-credit.

The previous situation is a serious violation of the rights acknowledged by the new Constitution and it is at the same time a loss for the country development. The State is responsible for assuring the full exercise of rights without any kind of discrimination. The new Constitution and the existing public policies in the country and the urgent incorporation of the gender and inter-cultural approach to the public services is demanded. Accessibility of women to financial and non-financial opportunities in equitable conditions cannot be an exception and it has vital importance in terms of gender equity because economic conditions are determinant in relation to gender and inter- cultural well being.

For the effect, services cannot be “gender neutral” that is not enough; they have to be “sensitive

to the different conditions between genders”. It means that the particular conditions of life that women experience have to be taken into account; for instance, the care of children and the family, the lack of a familial assets register and legal documents, lack of knowledge about administrative and legal procedures, besides a strongly marked patriarchal culture that sometimes discriminates and intimidates women in the exercise of their rights. It includes the under-valuing of labor and personal capacity of women by authorities that define programs and services also discriminatory at the implementation level in the day to day work. Besides, indigenous women suffer discrimination thrice for being “women, indigenous and poor”⁴⁰.

Therefore, in the scope of rural development, the full inclusion of women's rights with an inter-cultural approach by MAGAP in its policies and services will have not only an intrinsic value of assuring women’s rights in the rural areas but also, at the same time will positively affect the impact and coverage of services. In the long term, it will contribute to equitable and sustainable rural development. In order to achieve it, it is important to implement:

- 1) Change of service providers' perspectives and attitudes towards women and persons of different ethnic groups, and see them as persons entitled to rights similar to men, concerning production factors.;
- 2) Institutionalization of a mechanism inside MAGAP to assure the coherent and systematic incorporation of a gender approach from the perspective of rural women and inter-culture; and
- 3) Improve and modify the design of existing services and programs to be “gender-sensitive”.

(2) Legal and political framework in relation to agricultural services to incorporate the gender and inter-cultural approach

There are no sector policies or laws promoting gender equity as such. However, the existing policies and laws were formulated before the new Constitution so they are presently under review.

1) Organic Law of the food self sufficiency regime

This law, officially published in July 2009, covers all scopes from production to food consumption, including distribution and commercialization, as well as land use and water resources. In Title I of the “General Principles”, article 4 states that one of the basic principles is the equity of gender. In Title II “Access to food production factors”, Chapter I “Access to water and land”, article 6 stipulates that “The law regulating the land property regime will allow the equitable access to it, favoring small scale farmers and producer women that are heads of families”.

⁴⁰ CODENPE 2008. P.1-2.

2) Law of Agrarian Development (2004–02)

The law of agrarian development, as the base for the agrarian policies has as objectives the promotion, development and protection of the agrarian sector. This law reiterates the importance of training and acknowledgement of Indians, Montubios and Afro-ecuadorians. (Articles 3 and 4).

3) Agrarian Policies (2007–2020)

While these policies stress the importance of social inclusion of medium and small scale farmers, the gender issue is hardly mentioned. From the inter-sector scope, such policies enhance the “integral human development, especially in health and education services” and put forth the importance of including concepts of gender equity in the educational contents.

4) Agricultural sector Reactivation Plan (2007–2011)

In this plan, the integral development of Indians, Montubios, Afro-ecuadorians and agricultural producers in general is proposed.

(3) Recommendations for services to small scale farmers from the gender and nationalities viewpoint

The increasing role of women in agricultural production is acknowledged, as well as their entrepreneurship capacity and the high rate of reimbursement as micro-credit users. On the other hand, women do not have space to participate in the organizations' establishment or in the decision making processes. Although many services directed to small scale farmers are “gender neutral”⁴¹, usually they are designed and directed to men without considering the particular conditions of women (responsibilities as mothers and for housekeeping, illiteracy and/or cultural conditions such as male chauvinism, among others) and only in very few occasions are such services “Gender-sensitive”. As result, there is a perception that “Women do not have access to services though they are gender neutral”.

1) The land– INDA

Land ownership is a mandatory condition to access other services, such as training, credit and irrigation. INDA and PRAT⁴² have global goals established for new registrations, a generalized number, not specifying sex or nationality. However, the existence of discrimination toward gender and minorities cannot be denied.

Art. 6 of the Organic Law of the Food Self Sufficiency Regime states that it is “a law in which the regime of land ownership will allow the equal access to it, privileging small scale farmers and producer women heads of families,” so it is recommended to establish a modification of

⁴¹ Many supporting entities to small scale farmers interviewed in this Study such as BNF, affirmed that “Our products and services are directed to both sexes”.

⁴² PRAT: Program of Rural Land Regularization and Administration

PRAT's information system in order to promote the registration of women and nationalities to make monitoring easier.

2) Technical Assistance provided by the MAGAP provincial direction

Technicians of the provincial direction are in charge of technical assistance, besides inoculations, technical training, organizational development, commercialization and articulation with other institutions in the community. Problems and difficulties of MAGAP support services, from the viewpoint of gender and awareness-raising towards native population are the following:

Language and self-esteem

There are Indigenous women with low capacity to communicate in the Spanish language. Workshops and training for women about self-esteem are necessary, as well as about rights and leadership, as one of the prior conditions to use agriculture services.

Ordainment of government services and programs for effective support to women's development in rural areas

Likewise, in one meeting, the need to ordain the governmental entities and initiatives to direct development support to women in rural areas was mentioned. For instance, female users of the Human Development Bonus will be allowed to obtain technical assistance with priority from the government together with the bonus to strengthen their autonomy and economic security. It should naturally be accompanied by the afore mentioned training in women rights.

Commercialization

Technical assistance to allow collective sales is required. In the market, Indians are discriminated against and their products get lower prices, so technical assistance and credit could be individually provided but sales would have to be collective. It would also support the quality control of sales.

3) Training – INCCA

One requirement –Legal Person Registration

One requisite to participate in the training offered by INCCA is to be recognized as a legal person, making participation of women in rural sectors more difficult.

Care of children and the family

Training offered by INCCA is carried out in the place participants live facilitating the participation of women. However, sometimes it is difficult for women to participate because they have to look after their infant children. It is harder when training is provided for some consecutive days in a training center where participants have to be lodged; not only due to family duties but also because they need the husbands' permission.

4) Irrigation – INAR

There are cases of abuse in the use of community irrigation systems in terms of water

distribution and fee collection by the directive board. Many times distribution is not planned and in some cases water was not distributed to quieter members, including women.

Also when men are not present, women are in charge of irrigation infrastructure and water distribution and they participate in the irrigation committee. Therefore, participation of women in the decision making process is required.

5) Micro-credits– BNF

Notwithstanding the demands of PIO, BNF does not have a micro-credit financial line designed for women with a women's perspective in rural areas. BNF states that their “services are directed to men and women being gender neutral”; however, it has to be reiterated that financial lines being “gender neutral” is not enough; they have to take into account the particular conditions that women in rural areas live under. Technical training prior to the granting of micro-credit and follow up of users with along the execution of the same are necessary, therefore an institutional coordination mechanism at local level is required.

Possible negative impacts of micro-credit

BNF apply a mutual guarantee to organized women, they guarantee each other and in case one of them delays payment, the entire group does not receive the next credit. Although there is a mutual supporting system among them, women not capable of paying on time could affect the social net of women and they could be socially punished (ex. Excluded from the organization). In some occasions, women in rural areas request loans from other entities in order to pay back the first credit, generating higher expenses and thereby become highly indebted. Finally, possible negative impacts of micro-credit include the “feminization of responsibilities” such as assuming family economic responsibilities besides productive responsibilities.

5.5 Identification of the Technology and Necessary Services for Small-Scale Farmers

5.5.1 Farming Techniques

In the Sierra region, the type of crops and farming management types are diversified (Table according to the variations in altitude 5.5.1.1.). The tendency is that as altitude increases, the number of small scale farmers that focus their production on self-consumption crops increases, and in lower altitudes, closer to the urban centers, production is focused more on crops for the market. The potentialities, problems, development policies and the specific “Farming Techniques” should be organized considering the 4 climatic zones, farming types and agricultural products.

Table 5.5.1.1 Category of Farming Types and Main Crops by Altitude and Climatic Zone

Climatic Zones	Altitude	Farming Types		
		Focus on the Production of Self-Sufficiency + Cash Income	Focus on the Production of Commercial Crop + Self-Sufficiency	Focus on the Production of Commercial Crop
Andean	More than 3,601m	Andean Rhizomes Potato, Quinoa, etc•••		
Subandean	3,600~3,201m	Andean Rhizomes, Beans Potato, Broad Bean, Wheat, Barley, Quinoa, Lentil, Chocho, etc•••		
Temperate Interandean	3,200~2,501m	Andean Rhizomes, Beans Potato, Broad Bean, Wheat, Barley, Maize, Melloco, Oca, Chocho, Pea, etc•••	Vegetables Cabbage, Lettuce, Brocoli, Onion, etc•••	
Sub-Tropical Interandean	2,500~1,801m	Andean Rhizomes, Beans Potato, Maize, Frijol, Amaranth, etc•••	Vegetables, Fruits Cabbage, Lettuce, Brocoli, Onion, Carrot, Tomato, Tree Tomato, Raspberry, Apple, Plum, etc•••	

Source: JICA Study Team.

(1) Agricultural Potential for Small scale farmers

For the small farmer in the Sierra, major crops for self-supply and economic relevance are potatoes, maize, frejol beans, barley, wheat and broad beans. Actually, potatoes, maize and frijoles are ranked as strategic crops for small scale farmers in the “National Plan of Reform and Agricultural Productivity Including 9 farming products” of the National Plan for Good Living (Plan Nacional de Buen Vivir)” prepared by MAGAP. Traditional crops such as melloco, oca, chocho, peas and so on are also cultivated for self-consumption or for sale. If a small farmer cultivates one of the main 6 crops once a year, it is estimated that she/he can obtain a total income of approximately 1,000 US\$/ha (Table 5.5.1.2). Analyzing from the point of view of net profit, yield of barley and potatoes⁴³ are 906 and 883 US\$/ha respectively, so the rate of profitability is high (Table 5.5.1.2). Yield varies according to the quality of seed and mostly, potato production could double by introducing improved varieties⁴⁴. However, taking into account that the annual cash expenditure per farmer household is 1,800 US\$/year⁴⁵, it is almost impossible for small scale farmers to earn their living only with agricultural activities on one hectare, even if they sell the entire production of improved varieties of potatoes with higher profitability.

⁴³ Variety of native potatoes.

⁴⁴ Improved varieties “Gabriela” and “Esperanza” were developed by INIAP (See annex 1).

⁴⁵ Survey results carried out in the provinces of Tungurahua and Bolívar.

Table 5.5.1.2 Yield and Actual Income from Principal Crops

Name of Crop	Yield (ton/ha)	Expenditure ^{Note} (US\$/ha)	Total Income (US\$/ha)	Net Profit (US\$/ha)	Income/Expenditure	Profitability (%)
Potato	7.0	348	1,231	883	3.5	254
Maize	2.2	603	1,300	697	2.2	116
Frijol	1.4	795	1,300	505	1.6	64
Barley	4.5	414	1,320	906	3.2	219
Wheat	4.0	414	900	486	2.2	117
Broad Bean	2.0	620	1,260	640	2.0	103

Note: In general, small scale farmers depend on family labor in agricultural activities, and the labor cost isn't included in the expenditure.

Source: National Agricultural Census 2,000. MAGAP Chimborazo. FAO (Sven-Erik Jacobsen and Stephen Sherwood), *Cultivo de Granos Andinos en Ecuador-Informe sobre los rubros quinua, chocho y amaranto-*, Julio 2002. Aida Villavicencio V. y Wilson Vásquez C., *Guía Técnica de Cultivos*, 2008. Manuel Pumisacho y Stephen Sherwood, *El Cultivo de La Papa en Ecuador*, 2002.

Climatic zones and potential crops: It is considered that the alternative crops with competitive potential for small scale farmers that live in the Andean (more than 3,601m) and Sub-Andean (3,600~3,200m) zones is the quinoa, since it is possible to cultivate it organically up to an elevation of 3,800m and it resists poor soil, droughts and frost⁴⁶. Approximately 80% of the demand for quinoa in Ecuador is imported from Bolivia and Peru, only 20% is internally produced in the country⁴⁷. International demand in the United States, Europe and Japan increases every year, as well as the internal demand, and there is a high potential for local and international commercialization (Table 5.5.1.3). Also it is estimated that quinoa production could generate a gross income of 2,000 US\$/ha and it is one of the crops with high commercial value- (Table 5.5.1.4).

Table 5.5.1.3 Supply and Demand for Quinoa in Ecuador

Year ^{Nota}	Supply		Domestic Average Consumption (ton)	Demand		Lack of Demand	
	Total Average Production (ton)	Unitary Average Price (US\$/ton)		Average Importation (ton)	Total Average Demand (ton)	Unitary Average Price (US\$/ton)	Average (ton)
2006	721	484	3,405	1,567	4,971	494	4,250
2007	902	660	3,676	1,614	5,290	670	4,388
2008	1,084	990	3,948	1,661	5,608	1,000	4,524
2009	1,265	1,980	4,219	1,708	5,927	1,990	4,662

Note: Figures of 2008 and 2009 years estimated values.

Source: Técnico Corporación Puruha.

Table 5.5.1.4 Yield and Income from Quinoa Cultivation

Name of Crop	Yield (ton/ha)	Expenditure ^{Note1} (US\$/ha)	Total Income ^{Note2} (US\$/ha)	Net Profit (US\$/ha)	Income/Expenditure	Profitability (%)
Quinoa	1.2	543	1,980	1,437.1	3.6	264.7

Note 1: Expenditure is indicated by numeric value except the family labor cost.

Note 2: The value of total income is calculated with the average unitary price of supply in the Table 5.5.1.3.

Source: Técnico Corporación Puruha. INIAP "Pata de venado" (Taruka Chaki), 2008.

⁴⁶ About 2,000ha of quinoa is cultivated in Ecuador and it is considered that it could reach 90,000ha; that is to say, the third part of the total annual cultivated area in the Sierra (280,000ha) (Source: FAO(Sven-Erik Jacobsen and Stephen Sherwood), *Cultivo de Granos Andinos en Ecuador-Informe sobre los rubros quinua, chocho y amaranto-*, Julio 2002).

⁴⁷ Corporación Técnica Puruha.

Presently in Ecuador, 90%⁴⁸ of the quinoa is produced by small scale farmers and many women are involved in its cultivation. In the Sierra, the percentage of women who are occupied with agricultural activities on properties smaller than 5ha is approximately 40%⁴⁹, so they will have many opportunities to increase revenues through cultivation of quinoa, for it is relatively easy to grow, even for women farmers. Also, quinoa has a high content of proteins and energy value in comparison to other grains, at the same time it contains a lot of iron. As many women lack iron during pregnancy it may be said that quinoa is the ideal food to counteract the malnutrition.⁵⁰ (See annex 2, 3).

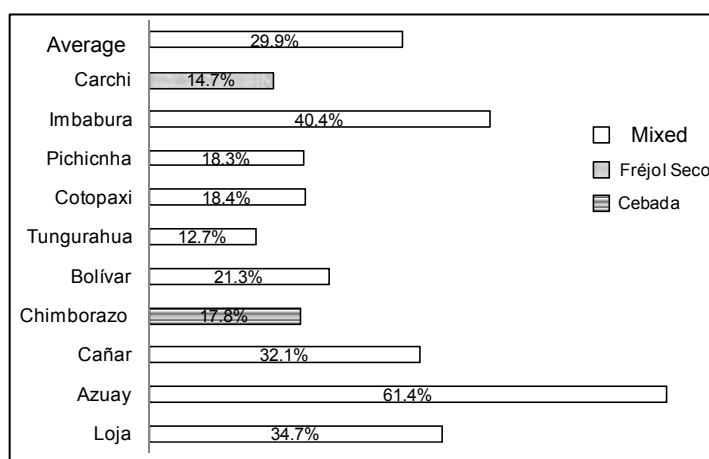
Besides the quinoa, chocho and amaranth are recommended as commercial crops (See annex 4). The current production of chocho supplies only 41%⁵¹ of the national demand and small scale farmers who live at high altitudes will have the possibility to increase cultivation areas for it can be produced in altitudes from 2,500m to 3,600m. On the other hand, amaranth can be cultivated in low valleys of the Sierra, between 1,500m and 2,800m. It can be consumed in many ways and demand may increase in the future through nutritional diversification⁵².

Table.5.5.1.5 Traditional crops with potential according to climate zones

Climatic zones	Potential commercial crops
Andean (more than 3,600m)	Quinoa
Sub-Andean (from 3,200 to 3,600m)	Quinoa, chocho
Temperate inter-andean (from 2,500 to 3,600m)	Chocho
Sub-tropical inter-andean (from 1,500 to 2,800m)	Amaranth

Cultivation methods and potential: in the 10 provinces of the Sierra there are many small scale farmers practicing mixed cropping (Figure 5.5.1.1).

The typical cropping pattern is maize-frijol or maize-broad bean. Provinces of Azuay and Imbabura stand out with 60% and 40% respectively, concerning cultivation area under this system,



Source: National Agricultural Census: 2000

Figure 5.5.1.1 Most cultivated crop according to provinces -Production Units with less than 5 Hectares-

⁴⁸ FAO(Sven-Erik Jacobsen y Stephen Sherwood), *Cultivo de Granos Andinos en Ecuador-Informe sobre los rubros quinoa, chocho y amaranto-*, Julio 2002.

⁴⁹ National Agricultural Census 2,000.

⁵⁰ Compared with wheat, quinoa has at least 1.5 times more calcium, 3.3 times more iron and double the zinc. Besides, quinoa flour does not contain gluten and represents an alternative for persons with problems of gluten intolerance (See annex 3).

⁵¹ FAO (Sven-Erik Jacobsen y Stephen Sherwood), *Cultivo de Granos Andinos en Ecuador-Informe sobre los rubros quinoa, chocho y amaranto-*, July 2002.

⁵² Amaranth use can be divided between the leaves and the amaranth grain. Seeds are used in soups, nougats, beverage, like popcorn and also in the preparation of bread, pasta and cookies.

while it doesn't reach 20% in Pichincha, Cotopaxi or Tungurahua (Figure 5.5.1.1). Tungurahua is characterized by the mixed cropping of fruits (tomatoes, apples, raspberries, pears and plums, etc.), cereals and pasture. Net income can vary considerably according to the input of materials and the demand and supply of product in the market, and yield of maize-frejol bean mixed cropping is higher compared with maize or frejol bean only, according to the harvested volume⁵³. Also, mixed cropping plays an important role in reducing the risk of losing the whole crop due to meteorological hazards, to mitigate soil erosion and to avoid the spread of diseases, pests and weed. For these reasons, for the small scale farmers that live with the focus of production on self-consumption, the system of mixed cropping favors a more efficient use of soil, and increasing income by sales of surplus production, besides assuring the self-consumption crop.

(2) Agricultural Problems for Small scale farmers

As the altitude increases, the agricultural production is quite limited due to meteorological factors, such as low temperatures, heavy rain and gales (See annex 5, 6, 7, 8, 9, 10), and at the same time, revenue from agricultural and livestock activities decreases. In the Sub-Tropical Inter-Andean zone (2,500~1,800m), agricultural and livestock revenues are approximately 3,000US\$/year on average; and it is approximately 1,500US\$/year in the Temperate Inter-Andean zone (3,200~2,500m)⁵⁴. However, in the Andean zone (more than 3,600m) and the Sub-Andean zone (3,600~3,200m), annual income is only 500~1,000US\$/year⁵⁵. In this way, altitude is a very important factor in agricultural production generating a difference of 2~6 times variance in agricultural income, especially for small scale farmers living at high altitudes, and it is quite difficult to make a living only on agriculture due to low productivity and long season rotation because of low temperatures, insufficient productive infrastructure and insufficient agricultural technical support service.

Migration of young people and men that abandon their lands have increased in recent years. According to the survey carried out in the 4 provinces, 40~50% of small scale farmers go to work in cities and big plantations. This increase of migration has caused the disintegration of traditional community activities like the "Minga" and the peasants' organizations. At the same time, elderly farmers and women are forced to practice agriculture in the traditional way, with cattle pulling plows in irregular terrain like hillsides and slopes along the mountain range, and there is not a system to allow them to receive new agricultural technologies under these circumstances.

According to the interviews with INIAP and small scale farmers, and the results of the surveys in the 4 provinces; in order to improve agricultural productivity of small scale farmers, five points regarding "Management of Cultivation Techniques" have to be worked out: "Seeds", "Land and Water", "Diseases and Pests", "Nutritional Improvement" and "Commercial Crops". "Nutritional Improvement" is not directly related to "Management of Cultivation Techniques", however this

⁵³ Source: Albrecht Benzing, *Agricultura orgánica-Fundamentos para la región andina*, 2001).

⁵⁴ Survey results carried out in 4 provinces (Cotopaxi, Tungurahua, Bolívar, Chimborazo).

⁵⁵ Survey results carried out in 4 provinces (Cotopaxi, Tungurahua, Bolívar, Chimborazo).

point was included due to the relevance of the issue in “Reduction of Poverty” for the present Study.

1) Seeds

- Inadequate conservation of harvested seeds: Insufficient management to control maize weevil (gorgojo) and molds during storage.
- Genetic degradation of traditional native seeds: Genetic degradation of local cereal seeds and low profitability due to low harvest yield.
- Inaccessibility to improved seeds for economic reasons: In the province of Cotopaxi, approximately 40%⁵⁶ of small scale farmers do not have access to good quality seeds and cannot purchase them for economic reasons. The network of farmers’ organizations does not work well in the distribution of good quality seeds in rural areas.

2) Land and Water

Nutritious Elements in the Soil

- Generally speaking, soil fertility is decreasing in the Sierra region: 70%⁵⁷ of the small scale farmers surveyed reported “reduction of soil fertility” and “lack of fertilizer”. Particularly in the province of Cotopaxi, more than 60% of farmers answered that they have problems with “lack of nutritious elements of fertilizers”. A great part of the soil in the Sierra is volcanic and lacks organic matter in general (See annex 12).
- Soil fertility decreases as altitude increases: pH varies from neutral to acid (See annex 12). Nitrogen, phosphorous and potassium in the soil go up down as the altitude increases (See annex 12). Organic matter decomposition is slower.

Use of Fertilizers

- Lack of knowledge regarding use of and required quantity of chemical fertilizers
- Livestock manure is not effectively used: Insufficient technology for processing and use of livestock manure as fertilizer.
- Lack of knowledge about agroecology.

Use of Land

- Division of land into small lots and inefficient use of soil.
- Agricultural tasks in lands with steep slopes.
- Lack of labor force for agricultural tasks.
- Inadequate handling of agricultural machinery like tractors that wears out land

Cropping System

- The tendency to monoculture, that is to say, cropping of the same product (Potatoes, etc.) in reduced areas causes loss of soil fertility.

⁵⁶ Survey results carried out in 4 provinces (Cotopaxi, Tungurahua, Bolívar and Chimborazo).

⁵⁷ Survey results carried out in 4 provinces (Cotopaxi, Tungurahua, Bolívar and Chimborazo).

- Crop rotation system, like the introduction of green manure such as alfalfa and clover in the cropping pattern has not been sufficiently implemented.
- Mixed cropping has not been sufficiently implemented. Monoculture is the cause for the increase of pests, diseases and weed.
- The agricultural calendar isn't fully used.

Use of Water and Irrigation

- Lack of water: More than 60%⁵⁸ of small scale farmers have difficulty in accessing irrigation water, one of the causes for low productivity. Particularly in the provinces of Bolívar and Cotopaxi, drought is the main reason for loss of crops, with a rate of 80%⁵⁹. Approximately 66%⁶⁰ of small scale farmers do not have irrigation installations.
- Lack of irrigation systems and effective use of water: Lack of training.

3) Diseases and Pests

- Inadequate application of chemicals (fertilizer, pesticide, and herbicide) producing negative impacts on the environment and health.
- The pest called “Moth (Polilla)” is the most serious problem in the cultivation of potatoes.
- Pests such as antcow, thrip, whitefly and worm damage the cultivation of cereals. There are many diseases caused by an epidemic called “Lancha” and nematoda. Especially in Tungurahua, problems with diseases and pests reach 50%⁶¹ of the small scale farmers' plots and it is the main cause for loss of crops.

4) Nutritional Improvement

- Production is insufficient to achieve a balanced diet and this causes malnutrition. According to studies of INEC, 40.1%⁶² of the indigenous population suffers from chronic malnutrition. Also, there is little habit of eating vegetables and food preparation lacks variety.

5) Commercial Crop

- The agricultural yield is low.
- Sales destinations are scarce: Lack of training for market information collection and lack of planned cultivation and commercialization systems according to the market demand. Inefficient functioning of farmers' organizations with the purpose of collective commercialization of agricultural products.

⁵⁸ Survey results carried out in 4 provinces (Cotopaxi, Tungurahua, Bolívar and Chimborazo).

⁵⁹ Survey results carried out in 4 provinces (Cotopaxi, Tungurahua, Bolívar and Chimborazo).

⁶⁰ Survey results carried out in 4 provinces (Cotopaxi, Tungurahua, Bolívar and Chimborazo).

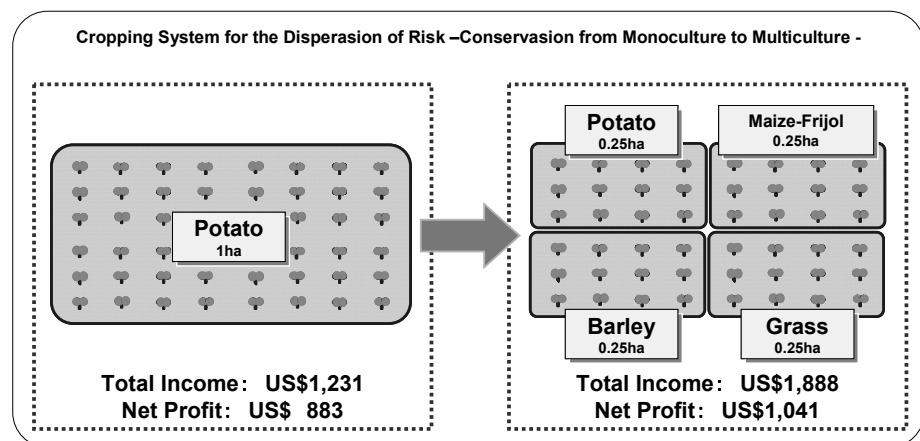
⁶¹ Survey results carried out in 4 provinces (Cotopaxi, Tungurahua, Bolívar and Chimborazo).

⁶² INEC: <http://www.ecuador.nutrinet.org/>

(3) Direction of the Development for Small scale farmers' Farming Techniques

Small scale farmers focused on Production for self-consumption need to carry out agricultural management with risk distribution by introducing Multiculture, like barley and pasture, instead of monoculture, to avoid climatic adversities and damage from diseases and pests, and so to improve income. (Figure 5.5.1.2). Also, from the point of view of poverty reduction, it is important to improve their nutritional condition through the implementation of home gardens.

To obtain more revenue selling agricultural surplus and commercial crops, small scale farmers' associations are needed to plan their production and sales. Through associations, farmers focused on commercial production will have more opportunities to dispatch more products such as quinoa, broccoli, cauliflower and raspberries to the market, depending on



Source: JICA Study Team.

Figure 5.5.1.2 Model of Cropping for Agricultural Revenue Stabilization the altitude and meteorological conditions. For example, ERPE⁶³ has associated small scale farmers and it has promoted production of organic quinoa for export to the United States since 1999. By assuring a fixed quantity in a group it will contribute to the promotion of the regional and community economies.

To promote farmers' organizations, trained personnel to perform as coordinators inside the communities are required. In the “National Plan of Rural Good Living (Plan Nacional de Buen Vivir Rural)”, MAGAP is planning to form facilitators in each province to support communities and farmers' organizations through the “School of the Agrarian Revolution (ERA)”. The strengthening of farmers' organizations through the facilitators is largely expected.

Observing the general panorama of agricultural production, the most important thing is to recover the fertility of the soil. Firstly, it is advisable to improve the crop rotation system. The crop rotation system presently used by small scale farmers is potato-potato-fallow or potato-broad bean-barley, etc (Figure 5.5.1.3). Although irrigation is needed in the dry season (April-September), after planting cereals in the rainy season (October-April), the cultivation of legumes and pastures is good to fix nitrogen in the soil and to reduce the erosion. Especially, a

⁶³ ERPE means “Popular Radiobroadcast Schools of Ecuador (Escuelas Radiofónicas Populares del Ecuador)” and it is an NGO to carry out rural development activities, such as organic cultivation, family economy and public sanitation.

variety of potato with high potential for nitrogen assimilation should be sowed after cultivating legumes or pasture (Figure 5.5.1.3). Taking into account that in the rhizosphere there are several bacteria beneficent both for potato and clover⁶⁴, the clover-potato combination is recommended. In land in preparation, movable fences are installed and then, by moving them in sequence, soil fertility is recovered taking advantage of the cattle manure.

Year	First Year		Second Year		Third Year	
Station	Dry	Rainy	Dry	Rainy	Dry	Rainy
Traditional	Fallow	Potato	Fallow	Potato	Fallow	
Convencional No. 2	Fallow	Potato	Fallow	Broad Bean	Fallow	Barley
Alternate	Clover	Papa	Alfalfa	Barley	Mixed Grass	

Source: JICA Study Team.

Figure 5.5.1.3 Crop Rotation System

Secondly, it is a method to introduce the green manures in the mixed cropping. “Vicia” of the leguminous group has a great effect to control the evaporation of water thus protecting the soil surface and it is possible expect a high yield in the mixed cropping of vicia-maize⁶⁵. Also, legumes such as broad beans and peas are introduced in the mixed cropping allowing the recovery of soil fertility, mixing them in during the period when stems and leaves are still green after harvesting the greenish grains.

Thirdly, regarding use of fertilizers, the content of organic matter in the soil is very low at 2 % in the Sierra zone and most of the soil is also characterized by the lack of phosphorus (See annex 12). Small scale farmers do not have enough organic matter for making compost with livestock manure and vegetable residuals; equally they do not know the technique or do not have the habit of elaborating it with these materials. Therefore, they mostly depend on poultry manure which is carried by truck from the Costa area. Depending on the crop, potatoes for instance, it is estimated that it would be necessary to spread about 10 to 15 tons of poultry manure for each hectare, at a price of 40~50US\$⁶⁶, which is not so expensive. The poultry manure has high nitrogen and phosphorus content in comparison with cow dung. Therefore, the introduction of poultry manure in the Sierra is proposed for soils extremely poor in phosphorous.

On the other hand, zero or reduced tillage is recommended as a cultivation system for soil conservation feasible for small scale farmers⁶⁷. According to data collected by INIAP regarding mixed cropping of maize-frijol, zero or reduced tillage presents higher capacity of humidity retention in the soil⁶⁸ as well as higher yielding and lower production costs⁶⁹, in comparison to

⁶⁴ Albrecht Benzing, Agricultura orgánica-Fundamentos para la región andina, 2001.

⁶⁵ Albrecht Benzing, Agricultura orgánica-Fundamentos para la región andina, 2001.

⁶⁶ Interview to a company of “Orchards Gatazo Zambrano” and to the farmers in Chimborazo.

⁶⁷ In Ecuador, soil erosion is a problem that affects 50% of the land. Loss by soil erosion in farm land reaches 80 ton/ha/year (Source: INIAP, *Evaluación de sistemas de labranza de suelos y fertilización en la asociación maíz-frijol voluble*, Boletín técnico No.121, 2004-Quito).

⁶⁸ For this research, plots with residue of barley and oatmeal were selected. Said residue stayed in the surface of soil in zero and reduced tillage plots.

the conventional way (See annex 10). In order to obtain satisfactory yields, a fixed quantity of fertilization would be necessary, but the management of conservation agriculture can be adopted by small scale farmers as an alternative for soil erosion control at low cost.

(4) Necessary Technology for the Support to Small scale farmers

As mentioned above, agricultural practices have to be improved according to the five guidelines mentioned in Table 5.5.1.6 to increase agriculture productivity and reduce poverty of small scale farmers.

Table 5.5.1.6 Measures for Technical Management of Cultivation

Problems to be solved	Details
Stable production and productivity improvement of self-consumption crops	
Obtaining good quality seeds	Improvement of seed selection and conservation
	Organization of farmers' communities for the distribution of good quality seeds
Improvement of productivity in the site	Establish and introduce fertilization methods (chemical and organic fertilizers) according to the climatic conditions (altitude) and type of crops
	Improve sowing systems with the introduction of the agricultural calendar
	Analyze and introduce an efficient irrigation system
Develop and disseminate soil conservation technology	Awareness-raising about the benefits of ecological agriculture to introduce it
	Analyze the possibilities of introducing reduced or zero tillage on slopes
	Disseminate the proper use of machinery, especially on slopes
Introduce the integrated control of diseases and pests	Training courses and introduction of integrated pests management (IPM)
	Utilization of biological pesticides (tests and introduction)
Put into practice and follow up of home gardening for commercial crops	
Promotion of activities to improve living conditions	Promotion of home gardening
	Dissemination of recipes using vegetables
	Organization of familial and agricultural book keeping courses
Put into practice and follow up of intensive agriculture as a method to develop communities and territories.	
Introduction of commercial crops and strengthening of marketing capacities	Introduction of commercial crops with added value (organic products, medicinal herbs, native products, etc.)
	Improve processing, distribution and sales of products by bettering organization

The following list shows the concrete techniques to be introduced in the support to small scale farmers:

Technique for the development	Stable production of self-consumption crops and improvement of productivity
Improvement in the selection and conservation of harvested potato seeds	Technique Improvement in the selection and conservation of harvested potato seeds of traditional potatoes to increase productivity
	Necessity: Low productivity of native potatoes is, among others reasons, due to the inefficient method of selection and conservation of seeds. The potato is one of the major crops for small scale farmers and priority and relevance are very high regarding improvement of agriculture income
	Observation: Small scale farmers do not know how to differentiate healthy and diseased seeds, how to store them, or how to prevent maize weevil (gorgojo) and fungi; therefore it is important to let these techniques be known to small scale farmers

⁶⁹ Zero or reduce tillage management leads to a reduction of costs for soil preparation, sowing and cultural tasks.

Technique for the development	Stable production of self-consumption crops and improvement of productivity
Introduction of mixed cropping maize and frejol beans with reduced or zero tillage	Technique: Mixed cropping of maize and frejol beans with zero or reduced tillage to conserve soil and improve income
	Necessity: Mixed cropping of maize and frejol beans with zero or reduced tillage reduces expenses and at the same time increases income. Also, it has great effects in soil conservation, being a very adequate system for small scale farmers. Although it depends on the expenses with fertilizers and other factors, net benefits are so high that income increases to some US\$ 1,400 as maximum per hectare (see Annex 13). This is one of the low cost agricultural techniques, sustainable and friendly for women and elderly persons.
	Observation: Mixed cropping of maize and frejol beans with zero or reduced tillage is not a widespread technique, requiring some tests beforehand.

Technique for the development	Stable production of self-consumption crops and improvement of productivity
Introduction of rotation system of clover and native potatoes	Technique: Clover and potatoes share bacteria beneficial for the soil, therefore rotation of said crops is pertinent.
	Necessity: The higher the altitude, the more the nitrogen decreases. Clover fixes nitrogen in the soil and it is forage for cattle.
	Observation: It is necessary to establish potato rotation regarding the future and analyze the possibility of introducing clover associated with other products.

Technique for the development	Stable production of self-consumption crops and improvement of productivity
Introduction of green manure	Technique: Introduction of leguminous like broad beans and peas in the crop rotation and associated crops system
	Necessity: It is better if small scale farmers mix them into the soil when stems and leaves are still green and after harvesting green grains twice or thrice. Income can be obtained from the harvested products.
	Observation: It is necessary to investigate the type of green manure to be introduced and how to cultivate it, for green manure cannot be used when irrigation is not available.

Technique for the development	Stable production of self-consumption crops and improvement of productivity
Integrated control of potato pests and diseases	Technique: Introduction of the integrated control of potato pests and diseases to promote ecological agriculture.
	Necessity: Moth larvae cause severe damage in potato cropping. Pest Integrated Management (PIM) will contribute to reduce the population of pests and increase crops.
	Observation: Farmers will have to acquire wide knowledge and techniques such as the distinction between beneficial and harmful insects, crop control, biological control, pesticide toxicity, ways to dilute pesticides, and crop dusting timing depending on the type of pests and diseases.

Techniques for development	Introduction of traditional and commercial agriculture practices
Nutritional improvement through home gardens	Technique: Nutritional improvement of farmers' families by cultivation of a wide range of vegetables and introducing them in daily cooking.
	Necessity: Ecuadorians consumes on average 2,278 kilocalories per day, sufficient energy to satisfy the minimum nutritional necessities (2,237 kilocalories per person per day according to World Bank); however, population in the rural zones of the Sierra consume an average of 1,971 kilocalories per day, not enough to supply the minimum nutritional necessities. This problem, in conjunction with a nutritional unbalance causes chronic dietary deficiency among the indigenous population. Therefore, the effect of home gardening to improve nutritional conditions is very high; besides, surplus can be sold.
	Observation: The way to promote home gardening depends on the availability of irrigation. At the same time, training in basic knowledge for preparation of organic fertilizer with daily waste is necessary.

Techniques for development	Introduction of traditional and commercial agriculture practices
Introduction of mixed cropping of raspberries and grass	Technique: Associated crops of raspberries and grass on slopes will allow the harvest of high earning crops, conserve soils and assure food for cattle.
	Necessity: Raspberries are more resistant to disease than strawberries and are relatively easy to grow. Besides, they can be harvested 10 months after sowing. By cultivating grass simultaneously, it is possible to contribute to soil conservation and assure cattle food. Raspberry thorns may hurt at the moment of pruning them; however INIAP is developing a new variety "Mora de Castilla" without thorns, with a yield of 20 to 30 tons per hectare and 12°brix. There is a high probability that it will replace the traditional raspberry.
	Observation: Raspberries do not resist many hours of transportation; therefore markets for sale have to be identified beforehand. At the same time, possibilities to form cultivation and processing zones have to be studied

5.5.2 Livestock Management Technology

(1) Potential Readjustment

1) Livestock Management and Technology for Small-scale Farmers

The livestock raised by small-scale farmers in Ecuador are considered to be the production materials to supply the necessities of life including foods such as meat, milk, furs and leathers, and the precious properties which are engaged in carrying goods in steep terrains and for cultivating agricultural fields. The livestock is raised in the stock-raising mixed agriculture system and the raising of livestock is done for diverse purposes including meat and milk production, use of fallow lands and cropped fields for pastures, use of crop residues for fodders, use of ridges for set grazing and mowing, use of cattle excreta for manures and use as draft animals. It is also important from the aspects that livestock is feasible by poor farmers having no land by securing fodders from common lands or by any other means and such poor farmers are employed by dairy product processing plants.

2) Stockbreeding by farmers as small-scale farm development models

The present status of stockbreeding by small-scale farmer models as defined in this Study is summarized in following table.

Table5.5.2.1 Stockbreeding by farmers as small-scale farm development models

Model	Clasification Criteria		
	Actual Situation of the Small-scale Farmers	Actual Situation of the Livestock	
		Milk/Pasture Production	Others
(1) ⁷⁰	Excessive limitation to introduce rentable cultures through the intensive agriculture.	<ul style="list-style-type: none"> – Daily Cow: one head or less – Pasture: 0,5ha or less – Use of páramo – Irregular Comercialization of Raw Milk 	<ul style="list-style-type: none"> – Raize of one suine – Raize of Cuye Mainly for Self-consumption <p>Trying the Possibility of a Rentable Agriculture</p>
(2)	Development Model to Enhence Several Support Organizations.	<ul style="list-style-type: none"> – Daily Cow: two or more heads – Pasture: 0,5 ha or more – Regular Comercialization of Raw Milk 	<ul style="list-style-type: none"> – Regular Comercialization of Cuye – Commercial Raise of suine, birds and quail <p>Trying the Possibility of a Rentable Agriculture</p>
(3)	Intensive agriculture exclusively for commercial objectives without doing self-consumption production.	<ul style="list-style-type: none"> – Intensive agriculture in small-scale UAPs – Development of milk production in large-scale 	–

Model ① has many restrictions (in terms of production infrastructure, access to markets and labor power) for introduction of cash crops in an intensive agriculture form. There are many farmhouses located in Andes mountainous climate zone (higher than 3,600m) and Andes sub-mountainous climate zone (3,600 to 3,200m high). The grasslands called ‘paramo’ are used to obtain fodder plants under the climatic conditions such as strong winds and heavy rains. The livestock species which can be raised are limited by altitudes. There are many areas in which it is impossible to raise milk cows due to the high altitudes. Bulls are grazed in paramos. In the Andes mountainous climate zones, mainly llamas and sheep are raised. Cuis are raised as domestic animals for meat consumption and about 10 cuis in average are raised in each farm. They are making self-supporting livelihoods because of the bad access to urban areas. Pigs are raised on food residues.

Model ② is the development model which is promoted by various support organizations at present. For introduction of intensive agriculture, the development of infrastructure (including irrigation facilities, vinyl houses, collection and shipment yards and roads), it is required the introduction of appropriate technology (tecnificación), organization and marketing. There are

⁷⁰ Model (1): Mainly self-consumption production + efective income (perform agricultural services, production of rentable cultures)
 Model (2): Mainly rentable cultures (intensive agriculture) + self-consumption
 Model (3): Rentable cultures (intensive agriculture)

many farmhouses located in the Andes greenhouse climate zone (2,500 to 3,200 m high), which are engaged in diverse agricultural production. Each farmer possesses 0.8 ha grassland on average and breeds 2 milk cows on average. In the areas where the infrastructure and market environment have been developed, milk cows are marketed regularly. Cuis, pigs, fowls and quails are commercially produced. An average of 2 pigs and 20 to 200 cuis are raised per farm.

3) Marketing Distribution Channels of Dairy Products

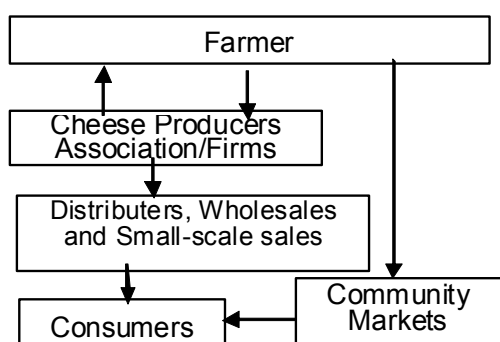


Figure 5.5.2.1 Marketing Chain of Dairy Products

The distribution channels of dairy products are shown in Fig. 5.5.2.1. Milk is collected by milk collector vehicles of cheese processors which make round tours in the areas where roads are developed for good traffic access.

The farm located in hilly areas, or those separated from roads, or those which have a low quantity of milk production per house are selling milk in two types: bringing milk to a processing plant and selling raw cheese processed by themselves. However, the cheese marketing network has not been developed yet and their shipping conditions are very unstable because cheese is sold by middlemen who visit those farmhouses irregularly.

Many cheese processors sell their products through the union of middlemen. The union of middlemen has the function of supervising the packing of products, implementing hygienic controls and filing the applications for products with authority in order to establish the brands of products.

4) Associated Project (CARDES)

CARDES is a project operated directly by MAGAP to support the cheese production (milk processing) and the processing and distribution of cuis (processing), vegetables and fruits. For livestock products, there are cheese processing plants and cuis slaughter/processing plants. The livestock-related projects implemented in Chimborazo Province are shown in Table 5.5.2.2 below.

Tabla 5.5.2.2 Related Project for Livestock by CARDES

No	Region	Beneficiaries		Processed Products	Production (dayly)	Instalation Utiliies	Finance
		Direct	Indirect				
1	Guamote	25	700	Milk	Milk 3.500ℓ	Monopolize	\$52.200
2	Colta	109	436	Milk	Milk 1.000ℓ Cheese 222 units	Processing.	\$55.538
3	Colta	115	460	Milk	Milk 1,000	Processing.	\$33.600
4	Riobamba	110	200	Cuy	200 cuy	Processing.	\$55.438
5	Riobamba	22	50	Milk	In planification	Processing.	Planing
6	Guamote	20	48	Milk	In planification	Processing.	Planing

5) Natural and Social Environments

The Sierra Region has terrain full of topographical variety and features various forms of stock breeding, livestock species and quantities of heads in different areas. In the study areas, the quantity of cattle is high. The altitude adaptable to milk cows is 3,200 m or less while the altitude adaptable to the existing species of beef cattle and draft cattle are up to 4,100m. Pigs are raised in the gardens of farmhouses in the altitudes up to 3,500m. The cattle species are mainly milk cows, Holstein, Jersey and the species mixed with Brown Swiss for milk and beef use, which have been imported from the United States of America. The farmers also breed the existing species that are adaptive to the environmental conditions. The raising form is grazing throughout the year and the breeding control is of grassland-dependant type. The productivity of the farmers using natural grasslands which are not fertilized or provided with soil improvement is low due to worse vegetation in the dry season. Pigs and cuis are raised on residues of foods and vegetables. The Sierra Region has being developed as an area of stock-raising where the number of cattle accounts for 79% of the national total and fresh milk production 73% of the total and the number of pig-breeding farmers is 73% of the national total. The potential for stock raising in the study area is summarized as follows:

Potentials

- Livestock is traditionally developed in the study areas.
- The number of cattle and the number of pig-raising farmers are high.
- Livestock is the production material to supply necessities of life including foods such as meats, milk, and furs and leathers.
- Livestock is precious property and used in transportation of goods and cultivation in steep terrains.
- The stock-raising mixed agricultural system is developed and organic matters are supplied to agricultural fields.
- The tastes for dairy products (such as cheese) are high.
- There are cheese processing plants in Riobamba and in its surrounding areas and the agricultural processing business can be developed.

(2) Arrangement of Issues

The questionnaire survey in 4 Provinces under the field survey included the items as described in “Chapter 18 Demands of Needs of UPA Producers” and the reasons for low productivity of agriculture and stock raising were summarized. As a result, most of the answers pointed out “shortage of water for irrigation”. The 10 causes in the higher rank are summarized in Table 5.5.2.3.

Table 5.5.2.3 Reasons of the livestock low productivity

		Indicators	Description
1	RH1	Lack of irrigation water	The small-scale farmers do not have the condition to irrigate the pasture.
2	SA1	Lack of access to credits	There are few farmers that have access to credits and the poor small-scale farmers do not get it due to the complex obtention procedures.
3	TA2	High cost of materials	High costs of the medicine for the livestock.
4	SA2	Access to courses and technology transfer	The small-scale farmers have low access to the courses and information of technical transfer.
5	TA5	Livestock genetics	The natural cross-breeding prevails, being difficult to improve the genetic capacity.
6	TA3	Lack of technical assistance	Lack of technical assistance for the individual UAPs.
7	TA1	Lack of knowledge	Low sensibility of the importance to conserve the reproduction data. It is not practiced the selection based on lactation data..
8	Rh2	Lack of irrigation system	Low coverage of irrigation system due to it's high construction cost compared to the actual disponible agricultural land.
9	S1	Low fertility	The farmers are trying to improve the fertility by introducing earthworms or fertilizers, but it is not sustainable due to it's high costs.
10	TA4	High cost of technical assistance	It is indispensable a cooperation of a veterinarian but this technical and diagnosis assistance have high costs.

The problems related to stock raising in the Block Diagram of Problems clarified in the problem analysis workshop in the JICA Technical Assistance Project “Capacity Development for Promoting the Sustainable Integral Rural Development for Poverty Reduction in Chimborazo Province” are summarized in Table 5.5.2.4. The causes of low productivity of the livestock are extracted from the main problems: 1) The productivity of the existing stock species is low; 2) The livestock pedigrees are low.

Table 5.5.2.4 Capacity Development for Promoting Sustainable Integral Rural Development for Poverty Reduction in Chimborazo Province

	Problems	Description
1	Absence of improved big and small animal races	Predominance of mixed races due to the high cost of cross-bred races. Predominance of natural crossed animals, being difficult to improve it's genetic capacity.
2	Disease of big and small animals	High mortality rate of borned animals due to lack of basic knowledge and hygienic control. The low reproduction rate due to mamite is a serious problem.
3	Lack of promoters and medicines	A veterinarian cooperation is indispensable, but their costs are high. The medicines have also high costs and they are with low disponibility.
4	Lack of pasture	The pasture without fertilization and soil improvement has reduced productivity.
5	Low knowlegde about livestock feeding	The small-scale farmers have low accessibility to the courses and technical information.
6	Lack of knowledge about the care of the livestock	The small-scale farmers have low accessibility to the courses, technical information and also to the support of public services.

Table 5.5.2.5 Capacity Development for Promoting a Sustainable Integral Rural Development for Poverty Reduction in Chimborazo Province

	Problems	Description
1	Livestock diseases	High mortality rate of borned animals due to lack of basic knowledge and hygienic control. The low reproduction rate due to mamite is a serious problem..
2	Lack of information about how to take care the animals	The small-scale farmers have low accessibility to the courses and technical information.
3	Lack of veterenarians	A veterianrian cooperation is indispensable, but their costs are igh. The medicines have also hig costs.
4	Lack of community level organization	The small-scale farmers are not organized neither exchange information.
5	Lack of pasture	The pasture without fertilization and soil improvement has reduced productivity.
6	Lack of pasture due to drought	The pasture without fertilization and soil improvement has reduced productivity during the dry season.
7	Lack of knowledge to increase the pasture	The small-scale farmers are not organized neither exchange information.

The above problems are shown in Fig. 5.5.2.2 Block Diagram of Problems.

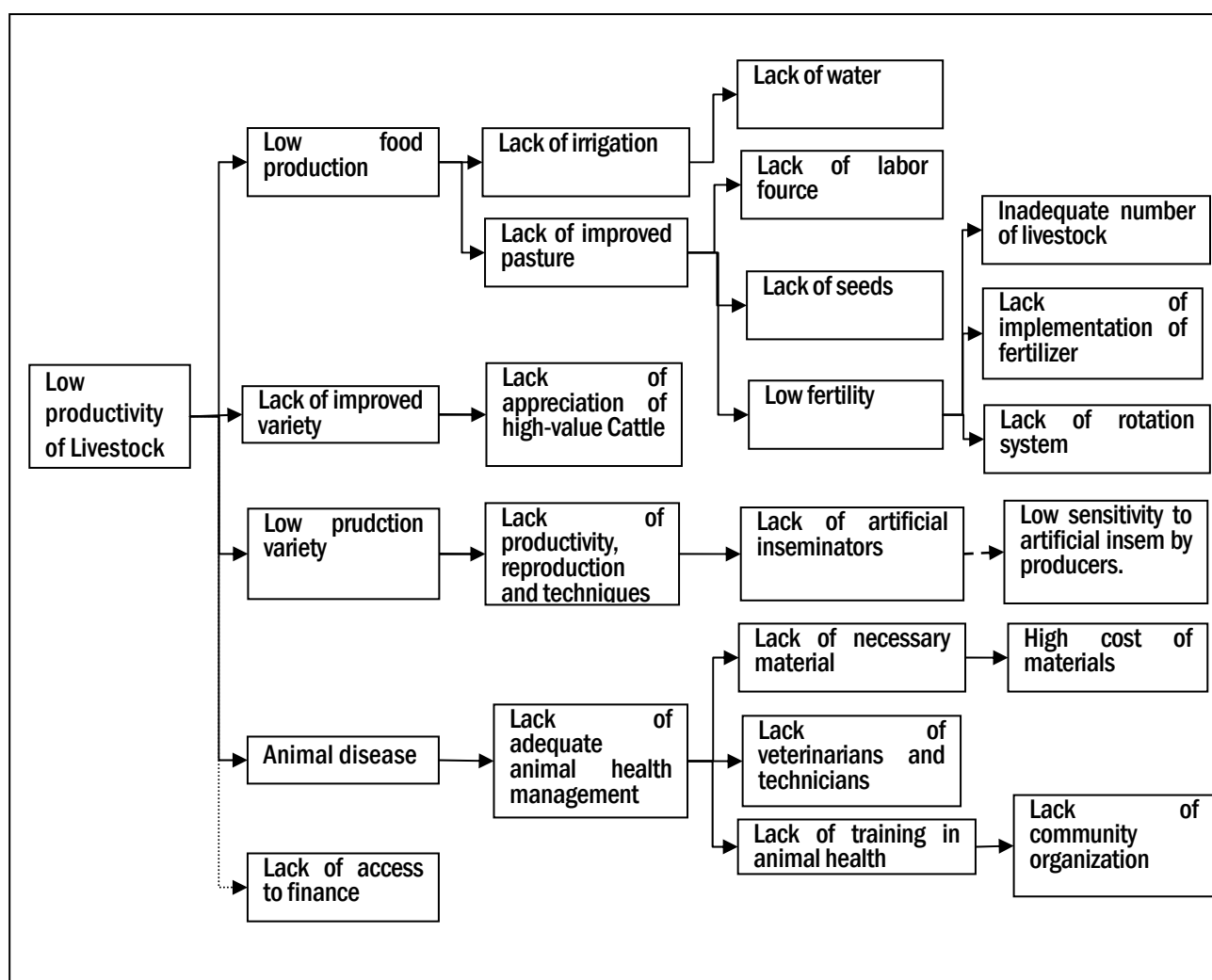


Figure: 5.5.2.2 Problem Analysis

1) Livestock technology of small-scale farmers in the study area

The livestock technology of small-scale farmers in the study areas will be described below.

① Raised cattle in study area

The cattle raised in the study area, that includes crossed species for milk and beef, uses interbred between the existing species and Holstein, Jersey (milk cow) and Brown Swiss (milk and beef cow) species. The mixed species features higher productivity (milk and beef) than the existing species. The existing species features low productivity, but higher adaptability to the environment at higher altitudes and higher resistance against underfed conditions due to shortage of fodders. The means to improve the productivity of stock raising are considered to be: ① Introduction of species with high productivity and ② Improvement of stock raising management.

The nutrition for cattle leads directly to the breeding performance. The delivery interval of the mixed species is shorter than that of the existing species. Therefore, it is preferred to interbreed the existing species with Holstein and Brown Swiss species which have high productivity in the study area.

② Livestock forms

The livestock form is grazing in natural grasslands. The weeds that cattle do not eat are not controlled. The soil is not fertilized and the grassland is not irrigated in general.

③ Milk production

The milk yield produced by each small-scale stock-raising farmer is 4 to 5ℓ/day in the case of feeding fodder plants only. Milking of cows is done by hand. Milking is done after the suckling of calves and after milking calves are suckled again. The consciousness of milking sanitation is generally low and the cleaning of nipples and dipping are not done, so that there are many cases of garget.

④ Breeding performance

The fecundation of mother cows is done at 33 months of age and the first delivery is made in the 43rd month in the small-scale farms in the study area. After that, one delivery is made every 2 years. Thus, the productivity is very low.

2) Factors impeding productivity and profitability

It became clear that the productivity and profitability of small-scale dairy farmers in this Study are impeded by the following 5 factors:

① Low spread of artificial insemination

As the small-scale dairy farmers do not fully understand the advantages of artificial insemination, natural fecundation is common and the bulls of which the ability is unclear or the stud bulls which are mixed species with strong beef bulls are generally used. The

improvement of the hereditary ability of bulls under set grazing is difficult.

At present, there are some cheese processing plants which are using artificial insemination as the core of such efforts, but the number of consultants specialized in artificial insemination is low and their technical capacity and acquisition of knowledge is insufficient to gain the confidence of the farmers. It is thought that these factors have delayed the spread of artificial insemination. As a result, the cattle groups are not improved and the productivity has not grown.

② Low productivity of fodders in grasslands

The small-scale poor farmers use mainly natural grasslands. Even if those are improved grasslands, they are not fully fertilized for soil improvement resulting in poor growth of grasslands, low productivity and low milk cow production.

Most of the farmers do not make silage adjustment for cows for milking and fodder supply. On the other hand, it is necessary to implement soil improving the crop rotation or any other method in confirming the effects of fertilization by soil analysis and nutritious evaluation of fodders (fodder analysis). However, it is difficult for small-scale farmers to make these analyses.

③ Poor quality of produced milk

Farmers do not have sufficient knowledge of sanitary control of milking cows and do not employ sanitary control for fresh milk. The fodder productivity in grazing lands is low and the milk quality is also low due to the poor nutrition.

④ Insufficient monitoring and control of individual cows' production and subsequent lack of breeding management

Many small-scale farmers do not fully recognize the importance of individual breeding records and the lactation ability of the individuals is not recorded. The cattle groups in which the sorting and selection of individuals by lactation performance is not done are not expected to improve their productivity.

⑤ Poor growth of calves

Farmers raise calves under natural upbringing by their mother cows for a long period of time. Therefore, the period of fresh milk production by the mother cows is shortened and the growth of calves is suppressed in their growing stage. If the calves are under artificial suckling, fresh milk is often supplied for a long period. But the sanitation management for raising them is so poor that diseases such as diarrhea spread and suppress the growth of calves. In their growing stage, the calves are often kept under set grazing in grasslands with poor vegetation and are not fully nourished during their growing period. These factors have adverse influence on lactation after they become mature cows.

(3) Purpose of Support of Small-scale Farmers and Development Policy

The goal of Program 4 “Participatory Technical Innovation Program for Improvement of National Stock Raising Productivity” in the National Plan for Good Rural Life (Plan Nacional de Buen Vivir Rural) by MAGAP is established as follows:

Goal: “Contribution to food sovereignty through the sustainable development of the stock-raising sector.”

For this upper goal, various programs are defined. 3 development models are defined in this Study. The goals and programs by MAGAP (Ministerio De Agricultura, Ganaderia Acuacultura Y Pesca) and the development models and the corresponding stock-raising technologies are summarized in the following Table 5.5.2.6.

Table 5.5.2.6 The development models and the corresponding stock-raising technologies are summarized

Development Model	MAGAP Program		Required Tecnics				
			Foraje Production	Race Improvement	Reproduction	Animal Sanity	Processo
Production stabilization for self-consumption and increase the productivity	Increase the productivity till 8 ℓ/head • day	Benefit the small-scale livestock farmers	⊙	⊙	⊙		
	Increase the meat production in hook till 55 %.		⊙	⊙	⊙		
	Increase the pasture capacity till 3 heads/ha		⊙				
Introduction and fixation of a rentable manual agriculture						⊙	
Introduction and fixation of an intensive agriculture with a determined magnitude of the investment as a initiative of local and community level	Fight against mouth-foot disease / control brucelosis and tuberculosis					⊙	
	Preserve the criolla race and increase the cattle				⊙		
	Silvo-pastoral system and pasture improvement		⊙				

The objectives of support for small-scale farmers and the development policy in the livestock sector are defined as follows:

- ◆ To allow livestock farmers to gain appropriate revenue and develop the production environment for a sustainable livestock.
- ◆ To produce healthy and high-quality livestock products to meet the needs of the consumers.
- ◆ To promote the common use of information and develop the environment to support a smooth distribution of livestock products.

The above objectives are interrelated with each other and if any of those is not attained, it is impossible to accomplish the support of small-scale farmers. Therefore, it is necessary to make comprehensive efforts for those items.

(4) Definition of Technologies Necessary for Small-scale Farmers

① Fodder production technology

The typical fodder plants cultivated in the Sierra Region include Kentucky bluegrass, perennial ryegrass, Italian ryegrass in the gramineae, alfalfa and white clover in the leguminosae. However, most of these are used for grazing and there are a few farmers which collect grasses to fulfill the lack of fodders in the dry season. The lack of fodders in the dry season is one of the problems. Usually 1.5 to 2 heads of cattle are grazed in 1 ha of grassland, but such grazing is extensive and weeds grow heavily and grasslands with excessive growth of uneatable grasses are seen. Therefore, it is necessary to give guidance to sweeping/mowing and removal of weeds.

② Breeder seed cultivation technology

The small-scale farmers have not kept any records at all and have been working without breeding records or knowing milk yields as well as without knowing the actual status of the capacity and milking quantity of each individual animal. To grasp the present status of these conditions, the data including date of birth, pedigree, parity, date of delivery, milk yield, and body size should be collected.

③ Breeding technology

As there are few consultants who can perform artificial insemination in the field and explain the characteristics and advantages of artificial insemination to the farmers correctly, the spread of artificial insemination is low. Thus, it is impossible to improve the hereditary features of the cattle. It is necessary to vitalize the enlightening activity for artificial insemination in order to promote it vigorously.

④ Cattle sanitation management technology

The farmers do not fully recognize the sanitation management of milking cows and sanitation management of fresh milk is not carried out. Therefore, it is necessary to furnish the enlightening education for them to correctly understand and recognize the necessity of sanitation management and artificial suckling.

(5) Practical Technologies Necessary for Small-scale Farmers

The practical technologies required to support the small-scale farmers are as follows:

The following are the skills needed to support small-scale farmers:

Guideline for the Development	Stable production of subsistence crops and improving productivity
Green fodder cultivation and introduction of silage	Technique : Combat the lack of feed and pasture in the dry season
	Necessity: The lack of feed during the dry season is a serious problem which the solution is very urgent and important to ensure stable food supply for the animals. Growing grass is easy and widespread in the region, while the introduction of silage requires training. Start the forage crop with minimal investment. It takes 9 m ³ of silage for each 10 animals, as construction investment will be about U.S. \$ 100 / 1 unit.
	Attention: The introduction of silage requires seminars to motivate the farmers. And for the introduction of forage crops need to study cropping patterns.

Guideline for the Development	Stable production of subsistence crops and improving productivity
Efficient and planned breeding cubs for sale	Technique: Introduction of the breeding of guinea pigs in cages and / or other more efficient ways of breeding and buy food collectively among groups and plan their sales.
	Necessity: The current supply of subsistence crops is poor and requires an urgent solution to stabilize. Cubs are highly priced source of protein and important for residents to ensure the food supply. Cuy breeding is widespread in the region and easy for farmers.
	Attention: It requires coordination with banks, as initial investment to buy cages. Cubs are highly commercial and profitable animals, but breeding can cause multiple diseases, so it will be necessary to obtain technical knowledge on hygiene and sanitation.

Guideline for the Development	Introduction and practice of artisanal and commercial agriculture
Introduction of collective management facility weaning of calves (shed)	Technique: Collective management of calves that allows a right to keep them healthy weaning.
	Necessity: Urge raising healthy calves. The calves are the heritage of the community, so it is important to keep them healthy. Now, to introduce a collective management of calf rearing, instead of raising them in the traditional way, farmers will need some training. It is essential to have proper installation and ensure food supply for the control the group, which is required to have knowledge and acquire skills. Also it will be required to invest the initially financial resources to build simple facilities, etc
	Attention: It is necessary to generate awareness and confidence of the community to raise calves together. Healthy calves are highly commercial and profitable. It is important to reduce the costs of parenting.

Guideline for the Development	Introduction and practice of artisanal and commercial agriculture
Construction of single milking pail	Technique: Building a healthy environment that can be milked in a hygienic manner and for knowing the health constantly calves and concentrated feed them when necessary.
	Necessity: Contamination of raw milk is a serious problem which solution is extremely urgent. It is great loss of profit by the farmers due to breast infection of the animals. Contaminated raw milk also causes a serious problem for processing plants, therefore the resolution is very important. Now, it is proposed to introduce a milking hygiene control, rather than the traditional way, because technically it is not difficult.
	Attention: It is necessary to conduct training, as farmers do not have basic knowledge of hygiene control. It will also need an initial investment to build a milking pail and buy devices to easily check breast infection.

Guideline for the Development	Introduction and practice of intensive agriculture with a particular investment to develop the community / territory
Sperm bank of quality animal species	Technique: Select high-capacity pets, recording and creating sperm bank for artificial insemination promotion
	Necessity: This technique is an urgent need to improve the capacity of domestic animals. In this way, it will make more effective breeding and production from the economic point of view. Farmers are aware of the importance of artificial insemination, but are reluctant to the introduction of this technique. It will require technical training to earn the trust of all and to promote awareness campaigns of artificial insemination. The initial investment is earmarked for a simple installation to preserve the sperm of animals. It will be very profitable due to the strong demand for better sperm species.
	Attention: It will require the collaboration of farmers to select highly trained and domesticated animals and equally is essential to conduct training to acquire knowledge of species selection and techniques.

Guideline for the Development	Introduction and practice of intensive agriculture with a particular investment to develop the community / territory
Manufacture and sale of high quality cheeses and efficient use of whey	Technique: Produce raw fat milk to produce high quality cheeses. In parallel it will need an efficient use of the milk to produce cheese.
	Necessity: Raw milk will be produced containing much fat to produce better quality cheese. At the same time, make an effective use of the milk to produce cheese, which is currently given to pigs. The dehydrated milk has high level of nutrition and is very profitable.
	Attention: It will be necessary to study the dehydration of whey, since this technique is not very popular in Ecuador.

5.5.3 Soil Conservation

In the region of the Sierra, a high percentage of small-scale framers’ agricultural land is gradually deteriorating⁷¹ due to soil erosion and loss of fertility. As a result, agricultural productivity decreased and this situation is one of the factors for the poverty of small-scale farmers in the Sierra region. In order to increase agricultural productivity in a sustainable manner, achieve the stabilization of farm management and food self sufficiency it is necessary to “maintain and increase soil fertility to stabilize and enhance the productivity of agricultural land” and “conserve soil through erosion control measures to prevent soil loss” and furthermore, reduce poverty.

In this section, the issue of soil erosion will be examined to identify the necessary techniques and services to reduce and mitigate soil erosion, as a basic factor of agricultural production, in order to stabilize and improve agriculture productivity.

(1) Actual Situation of Soil Erosion

The problems of soil erosion in the Sierra region are due to land clearing, plowing and other farming practices carried out under climatic and topographic conditions peculiar to this region. The causes of erosion are not on only due to factors of altitude, as indicated in section 5.5.1 “Technical Management of Crops”, but also a combination of factors like the climatic and topographic conditions, in addition to the production activities of small-scale farmers. Following, the problems of soil caused by agricultural activities under the characteristic natural conditions in the Sierra are presented.

Table 5.5.3.1 Impact of agricultural activities to the soil under the characteristic of natural conditions of the Sierra region

Problems of the Soil	Meteorological and topographical Conditions	Agricultural activities
Approximately 80% of the land has slopes steeper than 25 ⁰ degree in the Sierra and most properties of small-scale farmers are located on slopes; production activities have caused erosion, thus the soil now has reduced fertility.	Steep slopes	Irrigation Plowing Cropping system
The reduction of forestry area and the consequent loss of cover and protection against wind and rain have caused the erosion, and the eroded soil is inappropriate for agriculture.	Heavy rainfall intensity Strong winds	Reduction of cover and protection by cutting of trees

Slopes with little vegetation, which also means reduced cover and protection against rainfall and wind, and which are the predominant topography in the Sierra, can easily become saturated by rain and then the excess water is drained, forming a superficial flow causing soil loss. The tilled and pulverized soil, when exposed to the sun during the dry season, exhibits soil movement, such as "Creep," "Saltation" and "Suspension" through wind effects. So, soil loss is produced by soil movement through wind and also water erosion caused by the rainfall as indicated the following figure. The problems of erosion in the Sierra region as indicated in “Chapter 2, 2.3.2 Direction of

⁷¹ INIAP“Experimentación Campesina y Alternativas Silvopastoriles en Zona de Montaña”

improvement and preservation of soil fertility and soil conservation” are produced by poor irrigation management, plowing, cultivation system and land use under the natural conditions characterized by steep slopes, heavy rainfall intensity and strong winds.

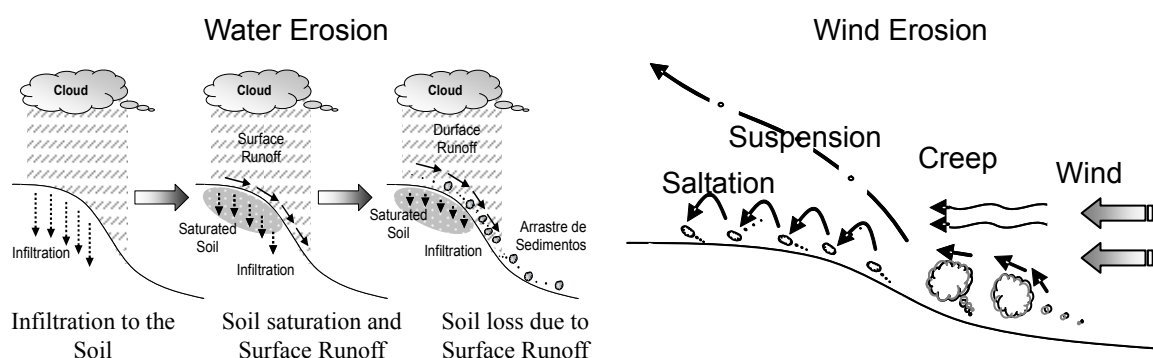


Figure 5.5.3.1 Soil movement and erosion in slopes

The Sierra Region is susceptible to erosion by water (rainfall) and wind (strong winds), which produces soil loss in the farm lands with complex combinations of the agricultural activities and topographic factors that affect the soil erodibility. Thus, it is necessary to address a measure for soil fertility maintenance and enhancement and soil conservation considering the basic factors mentioned above. In this section, the techniques and services required for these measures are detailed.

(2) Needs and Potential of Soil Conservation Activities

1) Initiatives of the State

The Political Constitution of Ecuador, in Title II “Rights”, Chapter 5 “Nature and Resources Rights”, Articles 71, 72 and 73, Title VII “System for Good Living”, Chapter 2 “Biodiversity and Natural Resources Conservation, Section 4 “Natural resources” and Section 5 “Soil”, declares that the State considers soil conservation to prevent erosion and desertification of soil as a priority issue, indicating that the State will implement afforestation and reforestation projects.

Not only the central government but also other institutions and agencies concerned with agricultural production are involved in the specific actions that cause erosion, as well as in the prevention of disasters related to landslides, and etc. to protect the safety of the Ecuadorian people. Agencies of the irrigation, energy and industry sectors using the water resources, also have addressed soil conservation which affects the recharge of aquifers. INIAP, one of the agencies affiliated with MAGAP, has engaged in tests and projects related to erosion, and has implemented watershed management projects to prevent this soil erosion since the eighties, using the results from the projects along with various measures including the construction of systems to control the erosion, and improving the cropping system, cultivation method and etc. Other interventions on the subject conducted by various organizations are agroforestry or silvopastoral projects aimed at sustainable agricultural production of small-scale farmers.

2) Techniques and practices of soil conservation of small-scale farmers

Indigenous people in the Andean region have traditions in conducting collective work: Minga and Randipac. Minga consists of providing mutual labor force to work for the communal land, animal husbandry, maintenance of common infrastructure, and etc. The Randipac also consists of the mutual benefit of labor in agricultural work. This system of collective work had traditionally been practiced on agricultural land using it in an intensive system, with activities that favored soil recovery.

In Pre-colonial times, indigenous people of the Sierra region carried out erosion control works through a network of earth canals, construction of terraces, and etc. based on empirical knowledge. Since the eighties, several projects of reforestation and erosion control were developed in Latin America, by initiative of FAO to prevent soil loss caused by surface runoff. These projects were also accompanied by other measures to improve farming techniques, such as contour cultivation, non-tilling cropping, and etc. The following summarizes the various measures against erosion implemented in the Sierra region.

Table 5.5.3.2 Erosion countermeasures in Ecuador

Countermeasure	Implemented Techniques and Practices
Reforestation	Windbreaks, reforestation for slope protection, river bank protection forests, silvopastoral forests, groundwater recharge forests
Construction works to protect against soil erosion	Dams (wood, gabions), low walls (rosemary branches, earth bags, tires, tailings embankment control), distribution canals, filtration ditches, fences
Improvement in cropping and cultivation system	Contour planting, mixed cropping, non-tilling cropping, green manure, agroforestry systems, silvopastoral systems, agrosilvopastoral systems

The Netherlands Organization for Development (SNV) performed an analysis regarding the impact of soil conservation measures on income in Guamote and Tixan (Chimborazo). According to the results of that analysis, the net incomes of potato producers were higher on plots protected with erosion control works (fences, terraces, reforestation and agroforestry system) than on unprotected plots since the first year (increase of U.S. \$ 30/ha), experiencing a greater increase in subsequent years, exceeding more than five times the income derived from unprotected land. As for the other crops commonly grown by small-scale farmers in the Sierra such as broad beans, barley and lupine, the income has been lower or the same in the first year, showing positive impacts from the second year. Thus, the adoption of erosion control measures in order to increase agricultural production in the Sierra contributes to improve the profitability of agricultural products also.

Table 5.5.3.3 Net income for the implementation of measures for soil erosion control

(U.S. \$ / ha)

Implemented Year	Potato		Broad Bean		Barley		Chocho (Lupine)	
	Net Income	Difference	Net Income	Difference	Net Income	Difference	Net Income	Difference
Before implementation	204		91		19		127	
First year	234	30	70	-21	-15	-34	127	0
Second year	381	147	176	106	58	73	165	38
Third year	808	427	347	171	111	53	236	71

Note: Net income to the total cost (cost of cultivation and soil protection)

Source: FEPP –Model of the Analysis of Soil Conservation Impact

(3) Issues of soil conservation

1) Technical Issues

Land plowing is a common practice in many farmlands in the Sierra during the rainy season (February-May). Also, plowing is carried out during harvest season between August and October, when strong winds occur. These practices cause water erosion in the sowing season and wind erosion in harvest season.

When analyzing the rainfall pattern in the Sierra, there is a predominance of drizzle fog type rains and heavy rains occur only in the rainy season. In general, excessive volume of rain during the rainy season saturates the soil with water and it is the main reason for superficial soil dragging, so that water erosion in farmland located in slopes is a serious problem.

On the other hand, in the dry season, the volume of evapotranspiration from solar effects is higher than the rainfall, turning the soil dry, and plowing after harvest under such conditions facilitates erosion of the soil by wind. Although the direct impact of strong winds is less than the water erosion, soil vulnerable to wind effects accelerates water erosion in the rainy season, four months later. Farmers do not consider strong winds as a cause for erosion, but rather as the cause for frost during harvest season.

Thus, soil erosion in the Sierra is produced by a number of interwoven causes such as the current farming practices plus meteorological and topographical conditions, resulting in the reduction of agricultural productivity. To mitigate damage from erosion, the following technical measures presented below are required.

Table 5.5.3.4 Problems and challenge of soil erosion in the Sierra region

Problem	Countermeasure
Hillside erosion due to irrigation ditches.	<ul style="list-style-type: none"> – Adoption of water saving type new irrigation techniques – Adoption of terraces on the slopes
Increased soil erodibility due to plowing practices at the sowing and harvesting seasons in agricultural land located on slopes	<ul style="list-style-type: none"> – Adoption of zero tillage system – Adoption of contour planting – Adoption of associated crops – Reforestation

In addition to the above, the following control works in land more susceptible to erosion are necessary.

2) Issues for the implementation of projects regarding control of soil loss

Several projects have been implemented so far by different organizations providing support services that incorporate soil conservation measures, achieving a certain positive impact. Unfortunately this impact was not maintained or sustained by the population once the projects were finished. The causes are presented as follows.

- To solve the problem of productivity reduction in eroded agricultural land, overexploitation or changes in the use toward fallow or grazing land have occurred but the local population is not very aware of the seriousness of the erosion.
- The rate of soil erosion and the effects of the countermeasures applied are difficult to identify with the naked eye, thus farmers are not aware of the dangers of soil erosion.
- In lands where structural measures like agroforestry and silvopastoral systems, filtration ditches, distribution canals, etc are introduced, said measures may interfere or impede farming activities.
- In case of implementing any measure on a plot, adjacent plots or the same micro-watershed may suffer the impact of erosion if they are not protected, so that adopted measures do not achieve tangible results.
- Small-scale farmers are not financially able to cover labor costs or the initial investment (purchase of materials) to install erosion control works.
- A high initial investment is required for the purchase of plants (grass, trees, fruit trees, etc.) to protect against erosion. Fertilizers for their maintenance are also expensive.
- It takes some time for fruit trees and trees planted close to the erosion control works to yield profits.

Within this context, it is necessary to implement measures of erosion control not only on individual plots, but also on adjacent plots or in the whole watershed for water erosion management to mitigate it and the diffusion and development of said measures is a serious problem. Following, a summary of the main problems and countermeasures to implement soil erosion control projects is presented.

Table 5.5.3.5 Problems and countermeasures for implementation of projects in the Sierra region

Problems for project implementation	Countermeasures
High initial investment cost of soil conservation projects, hindering its dissemination and development.	– Financial assistance for soil conservation
Difficulty in ensuring self-sustainability of control measures by the community only	– Design a project capable of generating not just a specific (plot) effect but an effect covering adjacent plots

Note) Results of analysis of information gathered through the problem analysis workshops organized in 2009 by a local consultant.

As indicated in item (2) “Potential of soil conservation”, small-scale farmers in the Sierra region have a long tradition of mutual assistance. However, they still do not have sufficient experience regarding “activities aimed to self-sustainable development” which is the objective for the creation of associations towards the future. Thus, once a project is implemented, even established associations need support to be able to carry out the expansion and dissemination of the development by themselves.

(4) Guidelines for the development of soil conservation

As indicated in item (2) “Potential of soil conservation”, the Government of Ecuador considers soil conservation as the basis for agricultural production, and as such it has been conducting several measures through different entities and institutions involved in the issue of soil erosion, according to their functions and roles. These are institutions in the sectors of agriculture, disaster prevention for the benefit of the population, and conservation of water resources. However, if the same agricultural activities developed to achieve food sovereignty are considered the causes for soil erosion in the region of the Sierra, it can be concluded that such productive activities should be necessarily be accompanied by measures for erosion control.

Within this context, this project sets out four development models to "direct small-scale farmers towards poverty reduction." Three of them are models to reduce poverty through agricultural activities, namely: “production mainly for self-supply”, “mainly profitable crops + cash income” and “profitable crop + self-supply production”. In order to implement these development models it is essential to implement erosion control measures to ensure the sustainability of productive activities.

Thus, it is necessary that both the farmers who carry out productive activities and the support services providers’ organizations conduct the corresponding feasible measures; otherwise soil conservation will not be achieved. Following, the basic development guidelines for soil conservation directed to small-scale farmers and organizations providing support services are proposed.

1) Control actions by small-scale farmers

As mentioned above, the development models are designed to reduce poverty by introducing

crops for self-supply and commercial crops in accordance with the existing conditions of the small-scale farmers. Farmers dedicated to self-supply production should implement simple erosion control techniques in their respective plots, through the use of locally available resources. Meanwhile, farmers who produce crops for commercialization should implement control measures not only on their land, but the whole zone should unite to gradually apply soil control measures over an extended area, using the income generated by the highly profitable crops.

However, the level of poverty is not the same for all farmers; therefore, the adequate “techniques of soil conservation possible to be implemented by each farmer and at the adjacent plots”, “techniques of soil conservation on properties with high grade of erodibility” and “techniques of soil conservation considering the micro-watershed as a whole” have to be evaluated at the time of implementation.

2) Development policies for soil conservation by the public sector

Measures applied take time to show tangible positive results as the erosion of small-scale farmers’ arable land in the Sierra region is caused by a number of factors that are intertwined, such as local natural conditions, existing agricultural practices, etc. This raises the need for each one of the actors to take feasible measures in a sustainable manner. It is necessary to choose the feasible measures for each type of farmer as a basis to

disseminate and develop said measures. Central and local governments, as well as local population and the private sector, should join efforts to participate in this process.

The present Reorganization Plan proposes the design, coordination and implementation of several projects and activities of the different organizations and institutions in an efficient and effective manner, through provincial round tables. It is necessary to include components of fertility increase and soil conservation measures to ensure production, for the sustainability of the supporting actions. Also, it is necessary to support small-scale farmers not only through projects, but also by providing routine extension services and continuously organizing awareness raising campaigns. Following, the support service types and the initiatives related to “soil conservation” are presented.

- Implementation of erosion control techniques in individual plots, simple techniques that

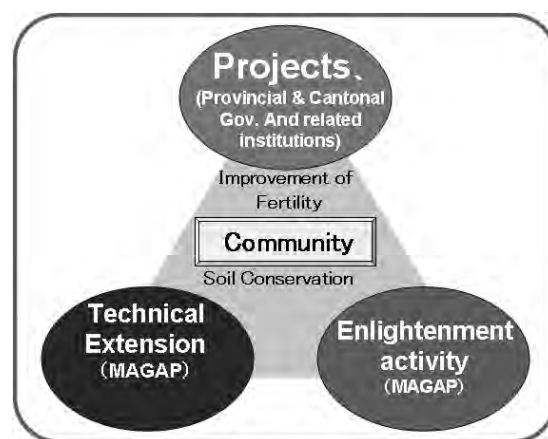


Figure 5.5.3.2 Activities for soil conservation and fertility increase

can be carried out using locally available resources by each farmer. For this, it is necessary to incorporate proper soil conservation measures at the planning and implementing stages of the agricultural projects, together with continuous follow up through routine extension service and awareness-raising by the support service provider organizations, once the project has ended.

- Implementation of control measures by farmers not only at individual plots, but for the whole area gradually extending its scope, using the income generated by highly profitable crops. For this purpose, it is necessary to design and implement projects aiming at soil conservation. After the completion of these projects, continuous support through routine extension services and awareness raising actions are required.

(5) Concrete soil conservation techniques according to the development guidelines

1) Techniques for Soil Conservation

Soil conservation techniques should be feasible for small-scale farmers to be disseminated and developed through the support of the public sector.

It is necessary for each farmer to take measures to control water and wind erosion to maintain the proper depth of arable land and maintain an ideal level of granularity, to preserve the soil so as to facilitate the growth of crops. Following, the different measures and techniques applicable in both agricultural and non agricultural erodible land are presented.

Improvement of plowing and land preparation:	Perform contour planting. This is particularly necessary in case of furrow irrigation. Zero tillage.
Terrace:	Building of leveled fringes following the contour lines (terraces).
Improvement of irrigation:	Adoption of water saving irrigation types by sprinklers or dripping.
Vegetal coverage of soil	Increase the rate of vegetal cover of farm land with associated crops. Cover the surface of naked or fallow land with stubble (cover).
Installing green fringes:	Creation of green fringes to prevent soil being transported outside the plots.
Erosion control inside and outside the plots:	Execution of simple works to mitigate erosion around the plots (filtration ditches, distribution canals, lines, etc.) to control hydraulic erosion of the same.

In case of intervening not only in individual plots but also in adjacent plots and over the whole

micro-watershed, erosion control works have to be executed to protect not only one plot but also the surrounding ones and the whole micro-watershed, implementing the following techniques to effectively control erosion and conserve the soil, which constitute important infrastructure of agricultural production

- Install green fringes or lines on the boundary between two plots.
- Building filtration ditches or distribution canals in erodible land.
- Building terraces (leveled fringes) along the contour lines on the plots located in erodible areas of the basin.
- Provide financial assistance for the implementation of the different erosion control measures to achieve soil conservation.

Several factors hindering small-scale farmers from implementing structural countermeasures for erosion control, which resulted in the low feasibility of sustainable development, were identified. These factors include “requirement of labor force for its implementation”, “works hinder farming activities”, “high initial investment cost for the purchase of plants (grasses, trees, fruit trees, etc.) that protect against erosion and fertilizer for maintenance”, “fruit trees and trees that are planted along with the erosion control works take a long time to return profits”, and so on.

As development guidelines, techniques feasible for small-scale farmers regarding the improvement of the cultivation system, farm management and irrigation methods are proposed. Likewise, simple control works, such as filtration ditches or distribution canals are to be implemented in particularly erodible farmlands and the surrounding. Civil works such as terraces or lines that require more labor force and economic resources should be gradually implemented, disseminated and extended once the infrastructures and increase of productivity are assured.

Table 5.5.3.6 Soil erosion control works and description

Control Works	Description
Filtration ditches	Excavate furrows along the contour lines 30 cm width, 30 cm depth and 3 to 5 m length, to mitigate superficial flow.
Distribution canals	Build canals following contour lines with a gradient less than approximately 8 %with 30 cm width and 30 cm depth to dissipate the superficial flow toward less erodent land. Land receiving dissipated water should be pasture or agriculture land to use water efficiently.
Terraces	Build leveled terraces following the contour lines to reduce superficial flow and dragging of loose soil.
Walls	Build dikes or fences with stone, wood poles, branches following the contour lines and stop the inflow of soil in farming land, plots, housing lots, , etc.
Cover works	Cover slopes that have little vegetal cover tending to erode with straw, branches, etc. to mitigate superficial flow.

To implement erosion control works for small-scale farmers, it is necessary to take into account the materials that are locally available and the ease of execution. These works should have a

useful life of from two to five years. For this reason, it is necessary to incorporate the planting of vegetation (trees, etc.) in the limits of properties, to maintain the inhibitory effect of erosion even after works are no longer operational. Since works are to contain the superficial flow, soil will retain more moisture, so it is necessary to select suitable and profitable varieties of vegetation.

2) Procedures for the implementation of soil conservation techniques

Soil conservation techniques include: (1) soil conservation techniques applicable by farmers on their own land and in their surroundings; (2) conservation techniques for erodible land inside their properties; and, (3) techniques that contribute to the micro-watershed conservation as a whole”. The concrete techniques and the implementation methods are described as follows

Table 5.5.3.7 Development models and soil conservation techniques

Techniques		Model	Individual plots	Zone of Plots	Micro watersheds
Reforestation	Windbreaks		⊙	○	⊙
	Woods to protect slopes			○	⊙
	Woods and protection of riversides				⊙
	Silvopastoral system		⊙	○	⊙
	Woods for water recharge			○	⊙
Protection works against erosion of soils	Dikes				⊙
	Terraces (terraces and small terraces)		○		○
	Walls		○	⊙	○
	Filtration ditches		⊙	○	○
	Distribution canals		⊙	⊙	○
	Lines			○	○
	Fences		⊙	⊙	
Improvement in plot management	Plowing on contours		⊙	○	
	Associated crops		⊙	○	
	Direct planting		○	○	
	Green manure		○	○	
	Agroforestry system		○	⊙	
	Silvopastoral system		○	⊙	
	Agrosilvopastoral system		○	⊙	

Observation) ⊙: Priority Technique; ○: techniques convenient to be implemented according to the needs

5.5.4 Mini-Irrigation

(1) Actual situation of irrigation sector

1) Existing conditions of irrigation installations

The Sierra region, the area of the present Study, has two seasons: one rainy and the other dry. During the dry season, evapotranspiration exceeds precipitation and it is not possible to achieve

a stable agricultural production without irrigation. According to the survey conducted to small-scale farmers in four provinces of the Sierra in 2009, only 34% of them had an irrigation system, while 66% practice agricultural activities on unirrigated land. As a result, when asked about the problems that most greatly affect them, selecting it from among them a choice between water resources, farming techniques, technical assistance services, distribution and marketing, etc., as a result, small-scale farmers selected problem of “lack of water for agricultural use as the cause for low productivity”. As suggested by this data, lack of water has the highest incidence in agricultural production at the Sierra.

Table 5.5.4.1 Percentage of small-scale farmers with irrigation in the four provinces of the Sierra region

Provinces	Irrigation	
	Yes	No
Cotopaxi	10%	90%
Tungurahua	67%	33%
Bolívar	3%	97%
Chimborazo	53%	47%
Total average	34%	66%

Irrigation projects are classified into the following groups: State Irrigation System Project; Association Irrigation System Projects implemented by the association of many irrigation associations; Community Irrigation System Projects and Private Irrigation System Projects. The "State Irrigation System Projects" refers to the systems constructed, operated and maintained by the State on irrigable land for the purpose of promoting agricultural development. The other projects are operated and maintained by associations and individual producers to stabilize and increase production at the private level. Of these, projects directed to small-scale farmers are association or community irrigation. In 2009, 41 projects of irrigation infrastructure rehabilitation and completion (association, community and private) were proposed by INAR for the province of Chimborazo, and 151 projects applied made to carry out Studies of Irrigation Systems (association, community and private); the need for irrigation system projects is very high.

2) Situation of the existing Irrigation Users' Associations

A total of 15,698 water users' associations requested water concessions in the four provinces of the Study area, of which 6,223 are irrigation associations (about 40% of all the four provinces), for an area of 440,000⁷² ha. The irrigation area a association for Cotopaxi is approximately 11 ha (the lowest among all provinces), Bolívar approximately 63 ha, Chimborazo approximately 87 ha and Tungurahua approximately 95 ha respectively.

⁷² Areas with water concession, not areas with actual irrigation; includes areas that could introduce irrigation in the future.

Table 5.5.4.2 Number of irrigation associations, number of members and irrigation area

Province	No. of Irrigation associations	Irrigated area (ha)	Irrigated area per association (ha)
Cotopaxi	1,103	69,586	11,40
Tungurahua	822	71,906	95,44
Bolívar	1,318	15,031	63,09
Chimborazo	2,980	284,407	87,48
Total	6,223	440,930	

5.1 Source: Summary of water concessions 2009 - SENAGUA

In the 4 province, Tungurahua shows the lowest poor rate, oppositely shows the biggest irrigated area by association. It is estimated that intensive agriculture and animal husbandry are practiced in Tungurahua. In contrast, at Chimborazo province, there are a large number of small-scale farmers living in the paramos, with little rain, where access to water is extremely limited. For this reason, there are a great number of associations demanding irrigation systems.

Average ration of water source of irrigation associations among 4 province are follows; springs 52%, streams 23%, and rivers 18%. The ration of groundwater sources constitutes only 0.6%. The four provinces are characterized by the predominant use of surface water. As the Sierra region is a mountainous area over 2,000 m altitude, in the case of Chimborazo for example, it is necessary to drill about 300 meters to build a well and operation and maintenance are very difficult. On the other hand, the conveyance system is predominantly by gravity, for maintenance costs are lower.

Table 5.5.4.3 Number of irrigation associations according to sources

Source	Cotopaxi	Tungurahua	Bolívar	Chimborazo	Subtotal
Rivers and traditional canals	84	-	5	39	128
Reservoirs	8	-	23	3	34
Lakes	12	1	1	1	15
Ravine (Quebradas)	143	176	477	650	1.446
Rivers	407	195	77	441	1.120
Canals for excess water	39	7	-	136	182
Springs	384	427	734	1.680	3.225
Others	26	16	1	30	73
Total	1103	822	1.318	2.980	6.223

Source: Information provided by SENAGUA

3) Construction cost of irrigation works

The following figure shows the unit cost of construction according to information provided by INAR (Bulletin of Works Execution INAR 2008)

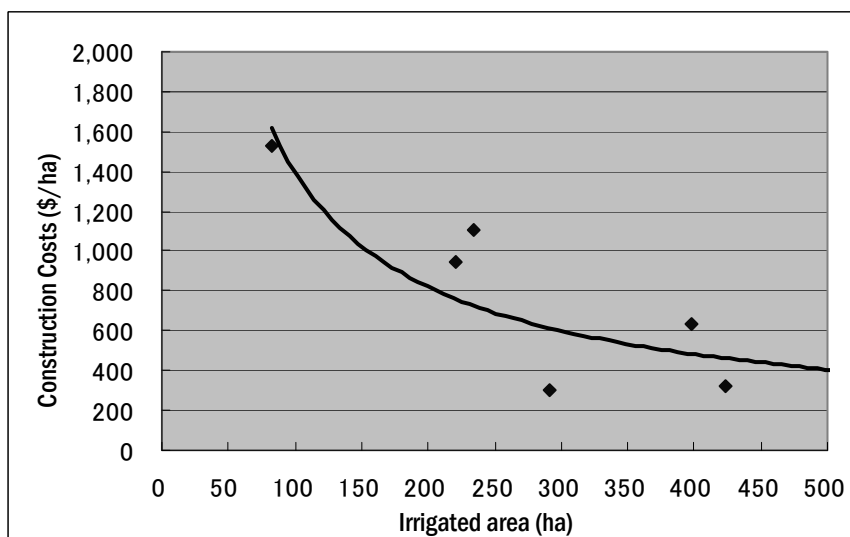


Figure 5.5.4.1 Relation between irrigated area and unit cost of construction

With increasing their irrigated area, the construction unit cost is decreasing and it is around \$ 400/ha for 500 ha. on the contrary , On the contrary, the irrigated area become small to around 100ha, the cost increases to three times. Cost of irrigation can vary according to the number and size of the works. In any case, these data are referential.

4) Operation and maintenance of irrigation installations for small-scale farmers

In Ecuador, the construction, operation and maintenance of irrigation facilities have been carried out by farmers through the traditional minga (collective work). Through this system of collective work, many small-scale farmers in the Sierra have experience in providing unpaid labor for collective work and there is a mutual understanding between farmers and supporting institutions concerning the responsibility of the population in the operation and maintenance of irrigation installations; thus, small-scale farmers are familiar with their part as recipients of public assistance beneficiaries.

(2) Potential of irrigation sector

1) Actions of the State

The Political Constitution of Ecuador, in its Title II “Rights”, Chapter Two “Rights for good living”, Section One “Water and Food”, Article 12 and in Chapter Five “Rights of Nature”, Articles 71, 72 and 73 on the preservation of biodiversity and natural resources, establishes water as a resource to be managed by the State as an indispensable element for achieving food sovereignty.

In regard to the competent authorities, in Title V “Territorial Organization of the State”, Chapter Four, “Regime of competencies” it is established that the central government has exclusive jurisdiction on protected natural areas and natural resources. It also establishes that provincial governments have exclusive jurisdiction over planning, construction, operation and maintenance

of irrigation systems. Furthermore, Article 260 states that “the exercise of exclusive jurisdiction does not exclude the concurrent exercise of management in the provision of public services and activities of collaboration and complementarities between the different levels of government”. Therefore, in the Irrigation area, INAR, as public entity can intervene together with the provincial government.

On the other hand, Title VII “Regime of Good Living” Chapter Two “Biodiversity and Natural Resources, Section Six “Water” establishes the creation of an entity in charge of water management planning, regulation and control.

In order to realize the provisions of the Constitution related to irrigation, the Government of Ecuador has created the National Secretariat of Water and promulgated the Organic Law on Water Resources, Water Use and Management (hereafter, “Law for the Use of Water”) which sets out the agreements on the use of water resources, including water supply, irrigation for food security, etc. and the role and responsibilities of each competent authority. Regarding irrigation directly related to agricultural policies, it establishes the need to build infrastructure to achieve the increase of agricultural production which is the goal of said policies, for which the State assumes the national planning of irrigation and sets the guidelines for the use of water resources and exploitation for agricultural purposes.

For the public irrigation administration, support in the application process and technical assistance related to the implementation of the irrigation system are assumed on one side, by the competent authorities in the conservation and management of water resources, and on the other, by MAGAP and provincial governments as providers of support for agricultural and livestock production, according to the legal framework of the sector.

Table 5.5.4.4 Procedures for irrigation implementation, authorities responsible for the evaluation of applications and support

Procedures	Application Request Evaluation Authorities	Supporting authorities
Obtaining water concession	SENAGUA	SENAGUA, MAGAP (INAR)
Preparing project profile	MAGAP(INAR)	MAGAP (INAR), Provincial Council
Signing agreement with the users association	MAGAP(INAR)	MAGAP (INAR)
Elaborating the project operation plan	MAGAP(INAR)	MAGAP (INAR), Provincial Council

Thus, the Government of Ecuador addresses the issue of preservation and management of water resources to ensure the good living of the population and the productive activities as a priority issue, establishing the provision of supporting services to local production, not only at central level but also involving regional governments, establishing the relevant legal framework as well as the required plans.

2) Irrigated area and the irrigable area of Ecuador

According to the Agricultural Census of year 2000, the total area classified as land for irrigation is 3,755,935 ha. Given this availability, the currently irrigated area is 852,494 ha, accounting for 23% of the irrigable area. The irrigated area in the region of the Sierra accounts for 42.49% (362,210 ha), but the province of Bolivar has less than 1% of the national total. These data reflect the high demand for irrigation systems in the region of the Sierra.

Table 5.5.4.5 Irrigated area (National and the Sierra)

Regions	Provinces	Irrigated Area (ha)	Percentage (%)
Sierra	Azuay	50,421	5.91%
	Bolívar	6,167	0.72%
	Cañar	52,264	6.13%
	Carchi	18,622	2.18%
	Cotopaxi	29,552	3.47%
	Chimborazo	50,772	5.96%
	Imbabura	29,340	3.44%
	Loja	41,113	4.82%
	Pichincha and Santo Domingo de los Tsáchilas	51,155	6.00%
	Tungurahua	32,804	3.85%
	Subtotal	362,210	42.49%
Costa	El Oro	98,631	11.57%
	Esmeraldas	8,569	1.01%
	Guayas and Santa Elena	299,874	35.18%
	Los Ríos	66,904	7.85%
	Manabí	16,087	1.89%
	Subtotal	490,065	57.49%
Oriente	Napo	1	0.00%
	Zamora Chinchipe	1	0.00%
	Sucumbíos	174	0.02%
	Subtotal	176	0.02%
Galápagos		43	0.01%
	Total	852,494	100.00%

Source: 2000 Agriculture Census

Of the existing irrigated area, 585,654 ha corresponds to private irrigation systems managed by associations, communities and individuals (hereinafter referred to as "private irrigation systems), which occupy 69% of the national total. The area irrigated by public systems amounts to a total of 266,840 ha representing 31% of the national total. In short, there are more private irrigation system than public ones.

Table 5.5.4.6 Area and services of irrigation systems

Irrigation system	Irrigation area (ha) and the Percentage (%)
Public Irrigation System	266,840 (31%)
Private irrigation system	585,654 (69%)
Total	852,494

3) Irrigation systems for small-scale farmers

Based on lessons learned from irrigation projects implemented in the past, projects directed to small-scale farmers in recent years have adopted techniques that involve less maintenance costs. Previously, a support provider organization carried out the design of facilities and the beneficiary association assumed its construction with labor provided by their members. However, currently, construction companies execute works by hiring labor force from the local community to improve the quality of facilities. An irrigation system consists of intake, conveyance and irrigation systems and the techniques adopted in each component are shown in the table below. Concerned institutions provide the required technical assistance.

Table 5.5.4.7 Infrastructure of Irrigation system for small-scale farmers

Intake	Reservoirs, intakes, grit chambers
Conveyance	Gravity type open canals (earth canals or canals with lining), underground canals, pipes, siphons, cisterns
Irrigation	Irrigation by spraying, dripping or superficial

It should be noted that the support for an irrigation project usually consists in a partial subsidy for the construction of intake works and water conveyance works (main and lateral canals), while the construction costs of irrigation canals to plots (tertiary canal) and the irrigation equipment are provided by the beneficiaries. In recent years, the need to provide technical assistance in this last part has been considered, in order to allow the effective use of the constructed installations once the project is finished, and several entities and institutions have launched said services.

(3) Issues related to the irrigation system

Several irrigation projects have been implemented by MAGAP and its attached institutions to support productive activities at provincial level achieving a certain positive impact. Unfortunately, upon completion of the projects, due to the lack of economic resources of the population, the water from the lateral canals to the plots was conveyed by earthen canals (+ superficial irrigation), with resulted in the inefficient use of water resources that have limited availability.

The waters users' associations, their members and the supporting entities should consider the previous conditions shown below, before implementing an irrigation system.

- 1) The irrigation facility requires operation and maintenance and its implementation demands new manpower.
- 2) The irrigation facility requires operation and maintenance and its implementation demands new capital.
- 3) Irrigation facility is a collective installation, joint property of the water users' association members and it requires a co-management system among users for the use, operation and maintenance of the facility.

The issues related to irrigation concern not only operation and maintenance or technical aspects but also the construction of the installation. A concrete description of each issue is shown below.

1) Issues related to the infrastructure construction

By request of the water users' associations, support to community irrigation projects have been provided with regard to obtaining water concessions, planning and project implementation, operation and maintenance techniques for installations and farming techniques. Basically, beneficiaries are in charge of the application procedures, but in a community project, it is very difficult for small-scale farmers to pay for the costs required for the study, and they don't have access to technicians to execute these studies.

Projects are to be implemented on a fiscal year basis and projects covering more than two years are divided into phases and each phase corresponds to one fiscal year. Therefore, there are some irrigation projects that have problems such as “a project that required more than one year did not have the budget assured and construction was not finished”, or “the facility needed to be repaired before completion of the construction, which demanding much time before effective use of the irrigation facilities.

2) Issues in Irrigation techniques

Given the steep topography of the Sierra region, the long traditional earthen canals conveying water from the intake to the plots cause loss of valuable water due to leakage, which impedes efficient use. Furthermore, irrigation in plots is done through a superficial system causing loss of water through evaporation and leakage. Thus, the loss of water for irrigation during conveyance or irrigation constitutes a technical problem in the Sierra region. Below, the main problems during conveyance and irrigation are summarized.

Table 5.5.4.8 Issues in water conveyance and irrigation

Conveyance	After the execution of the irrigation system project, construction of tertiary canals corresponding to the beneficiaries is usually earthen canals, and limited water resources are ineffectively used. For this reason, it is necessary to use water resources effectively by “using PVC pipes for tertiary canals”, and “temporarily storing conveyed water in tanks to distribute it to each plot”.
Irrigation	The issues of irrigation methods are shown below. <ul style="list-style-type: none"> – Surface Irrigation: The most traditional method. Plots are watered for a constained period from the irrigation canal. Water is not sufficiently absorbed by plants and it evaporates from farm, leaks and canal goes the land, producing the greatest loss of irrigation water. – Sprinkler Irrigation: Water is conveyed by gravity and requires less investment in facilities compared to drip irrigation; in addition, maintenance is easier. However, it requires five times more water than drip irrigation. – Drip irrigation: Water requirement is a fifth of sprinkler irrigation and allows the efficient use of water. However, it requires higher investments in facilities, as well as in maintenance. Terminal pipes have a short life. For this reason, this system is used for cropping of highly profitable crops.

(4) Measures for irrigation

The present Study sets out three development models to “direct small-scale farmers towards

poverty reduction”. These are: "production mainly for self-supply”, “mostly profitable crops + cash income” and "profitable crop + self-supply production”. To implement these three models of development it is essential to implement irrigation to stabilize production.

Irrigation measures can vary according to the existing irrigation system. Even so, they can vary according to a zone with irrigation systems and abundant water or a zone with irrigation systems but with little water available. In the first case, technical irrigation is an issue, but has low priority as an irrigation measure. Irrigation techniques proposed here are directed for the second case, meaning the zones with irrigation systems but little water resources. Furthermore, measures for zones without irrigation are proposed also. In the following Figure the different measures according to this classification are schematized.

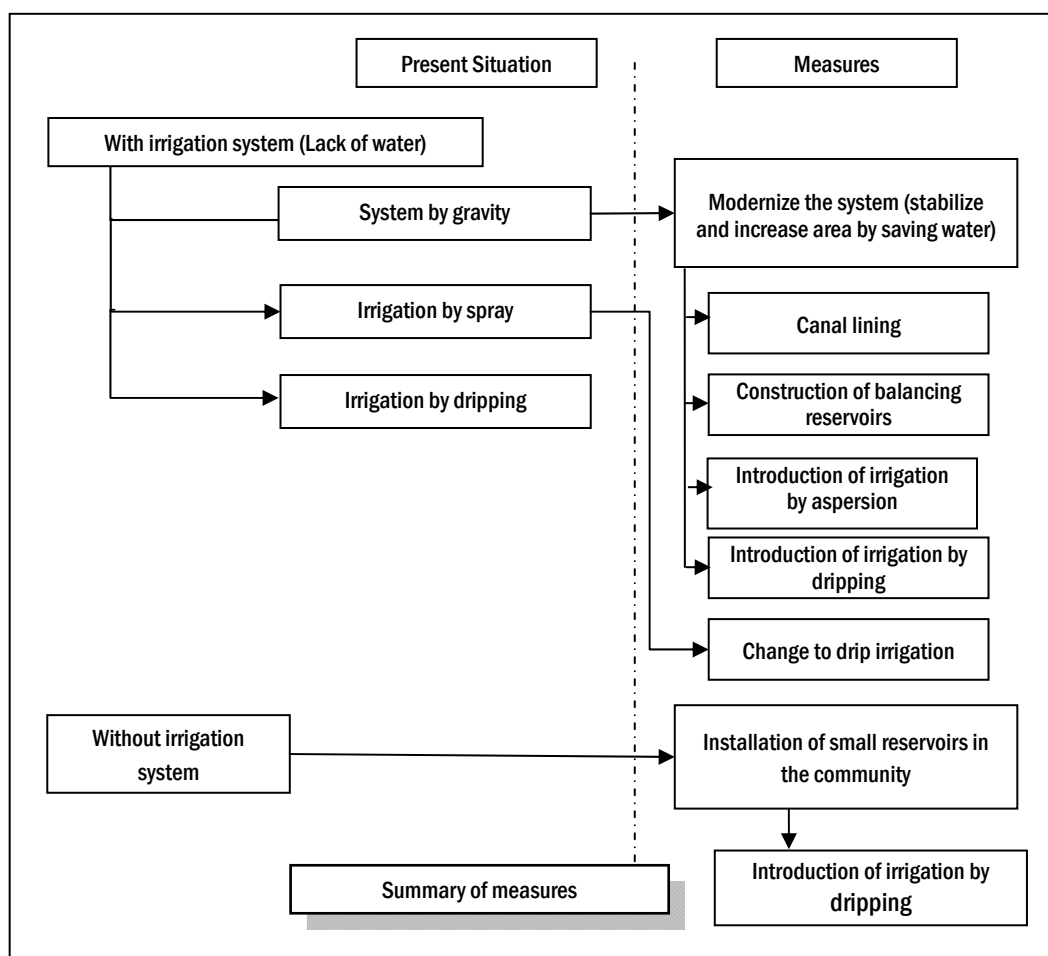


Figure 5.5.4.2 Classification of Measures for irrigation systems

Unirrigated land can be gradually transformed to irrigated land by the installation of irrigation systems, from the superficial method to the use of sprinklers, and then to the dripping system, in order to save water and also to control soil erosion caused by superficial flow, stabilization of irrigation and expansion of irrigated area. However, prior to the replacement, it is necessary to first analyze the cost and benefit considering the costs necessary for adoption of new techniques. According to the results of the survey to small-scale farmers, there are farmers, though not many,

who have adopted the irrigation method by dripping or spray; therefore, in a certain measure, small-scale farmers are accustomed to introduce these techniques.

In case of gravity system from the intake through the conveyance, the following irrigation techniques allow the stabilization and expansion of irrigation area by saving water.

Canal lining:

Regarding earthen canals, loss of water could be reduced by the use of concrete canals or pipelines, and thus, increase the total effective volume of irrigation.

Small Tank Installation for farm irrigation:

By constructing a small reservoir in the canal system, the instability of the intake could be compensated for, increasing the general capacity of installations and thus, increase irrigation areas.

Changing irrigation methods:

If at present, gravity irrigation is applied for the irrigation system, the introduction of sprinkler irrigation or dripping irrigation should be analyzed; if the sprinkler irrigation is being applied, the change to the dripping irrigation should be analyzed.

If any irrigation system is not available, it could be designed considering the previously mentioned guideline as a reference. However, a long time and high investments are required for the materialization of a project, so it is necessary to design a feasible system, easy to be implemented by small-scale farmers. According to the survey results, in Tungurahua province, 10 % of the irrigation sources were constructed by the same users in their own basins. It would be possible to build small communitarian reservoirs in a depression near the community to hold rainwater and the superficial flow running in the zone. In this case, the whole community would have access to irrigation water, although users would have to water their land by using buckets. In case a water tank is built at a high place, water could be lifted either by hand or by small pumps, allowing even drip irrigation.

5.5.5 Sale and Distribution

(1) Potential

Small-scale farmers sell their agricultural produce basically to the middlemen of markets. They bring their produce to the markets by vehicles or donkeys. As advanced cases, cooperative shipment/sale by farmers' groups, use of delivery service by buses for the shipment, and export through distributors are observed. As for raw milk, in some areas, milk is gathered by collectors, who travel the areas by trucks, and in other areas, farmers bring their milk into processing factories. Livestock transaction is carried out in livestock markets lying at the feet of mountains every week. Small-scale farmers take their livestock into the makers and the middlemen purchase it.

In Ecuador, a great variety of agricultural products is produced according to each altitude and region. Since these products have specialties of the region, frankly speaking, the products can be sold if the farmers bring them to other regions⁷³. In the Sierra region with high elevations, vegetables and fruits of highlands and dairy products are the specialties, whose prevailing selling destination is Costa area, such as Guayaquil. The topography of the plateau hinders the transport of products but the climatic condition of the plateau offers a climate suitable for the vegetables of highlands and a natural cold chain.

In the Sierra region, there are numerous farmers' groups of cooperative shipment/ processing/ sale, who proceed with their activities, receiving the support of the government, NGOs and foreign donors. There are many cases that firstly small-scale farmers organize an agricultural cooperative, which take charge of production, and later the cooperative organizes a corporation, which take charge of collection/ processing/ selling of their products. These organizations aim for stable sale of agricultural products which are good quality and high value added through carrying out the agricultural production and the processing/ sale, comprehensively. Through the activities of the groups, small-scale farmers can learn and introduce necessary techniques for the agricultural production based on the market needs. The success of their projects allows them to sell their products stably by a little higher price than that offered before.

(2) Challenges

In the case of the poor small-scale farmers, the immediate challenge is to secure the production volume for their self-consumption. They are in a situation that they ship their crop/dairy products when they harvest a small amount of merchantable products to cover the shortage of cash income, which is obtained by migrant work etc. The farmers who want to ship their products sometimes discuss and coordinate with them and use a neighboring truck together to reduce the cost of transportation. Even in the regions with more number of poor small-scale farmers, the farmers in advanced communities feel the necessity to carry out planned cooperative shipment, but it seems to take time to come to take the concrete action for the cooperative shipment.

The farmers who have production volume for large sale ship their products to the middlemen of the neighboring market, and also dairy processors / buyers collect raw milk / meat and eggs from those farmers. Most of the middlemen are under private or family management. In case of the long-distance transportation of agricultural products from a producing district to an urban market, five middlemen can intervene between small-scale farmers and final consumers. The intervention of many middlemen leads to a high distribution cost, which is considered a comparatively high margin of the middlemen by the producers and the consumers.

The polarization of poverty and wealth, which characterizes the economy of Ecuador, is also a

⁷³ It is observed that dealers in Costa convey bananas to Sierra by trucks to sell them and they load apples onto the same truck and return to Costa to sell them.

remarkable phenomenon in the processing, sale and distribution⁷⁴. Since the processing, sale and distribution operated by big capitals are far removed from those by small-scale farmers, they seem not to be related at first sight. However, if once a farmers' group tries to proceed to the measures from the traditional way, it will be immediately forced to compete with the brand and the low price of major makers⁷⁵. Hence ordinary small-scale farmers think that they cannot compete so much with the major makers if they try to process their agricultural products. The existence of the major makers is the entrance barrier toward the processing of agricultural products for small-scale farmers. Also, even if small-scale farmers stay in the traditional farming and selling, they can be involved in the competition with the imported agricultural products of major dealers⁷⁶.

(3) Development policy in the future

Model 1: Stable production for self-consumption + Improvement of the productivity

Objective: Formation of farmers' groups and cooperative shipment to the local markets

In the case of the poor small-scale farmers who face severe cultivation conditions and cannot procure necessary inputs, the first step for the improvement of the sale is the cooperative shipment through the formation of small-scale groups. To change the passive sale, which the farmers are forced to sell their surpluses shortly after the harvest at the market price, they shall form groups of 10-20 farmers in each community and struggle to negotiate with middlemen about the price, decrease the shipping cost through cooperative work, ship their products systematically, taking into account the price fluctuation of the market, etc.

In the communes with high level of poverty in the mountainous regions, even if they receive the support from the outside accompanied commencement of the project, when the support stops once, as it is so hard for the farmers to produce even food for their family-consumption, tis activities also often stop. The activities of this model are to organize a farmers' group, ship their products cooperatively and sell a considerable amount of agricultural products. An advisable approach is to start from a closely united group/ commune even if the conditions of production and market are almost same⁷⁷.

⁷⁴ Fresh cheese, which is not shown even the date of manufacture, is sold by the piece in town markets. On the other hand, processed cheese, which is packed in a hygienic factory with the best before date, is sold at more than ten times price in supermarkets of huge capital, located in a few blocks ahead of those town markets.

⁷⁵ In the small-scale processing of dairy products, whose standard product is fresh cheese, the production of yogurt is considered as the first goal in the diversification of the products, but yogurt of major makers penetrates into retail stores in local areas. The small-scale makers cannot sell their yogurt without reducing the price considerably since the major makers have established their brands on the base of the food security.

⁷⁶ According to the staff of CADERS, about five years ago, a powerful capitalist imported and sold foreign fruits at low price, which had national fruit farmers collapsed. After that, the capitalist raised the price of the fruit and got excessive profit.

⁷⁷ A project in failure of Chimborazo Office of CADERS is the case of the group, whose members were not cooperative and have a strong tendency to look for personal benefit before the benefit of the group. Although the plan of the project was approved in the headquarters of CADERS, it was suspended by the decision of the Office in Chimborazo because embezzling the budget was feared on the part of the members.

In the activities of the project, the main organ of the support should monitor the details of the activities, considering the roles of each member, to avoid remaining the inputs in some members. The cantonal authority is suitable for the main organ since the staffs are required as agricultural extension officers / facilitators to coordinate the activities in connection with the regional life. Also, the implementation of the project demands an enough investment of time and human resources, so the number of the project will be limited. However, no matter how excellent results can be obtained during the project period, if the activities will not continue after the end of the project, it will not make any sense. The important thing is to change the communes little by little in a sure way.

Model 2: Cash crop with manual industry (intensive agriculture) + Food production for self-consumption

Objective: Sale to the regional market through the system of cooperative shipment/processing

It is required to organize/ strengthen organizations of cooperative selling and to establish the system of cooperative shipment, since actions which try to organize groups especially for sale are observed even if farmers' groups are not organized in the regions where the intensive agriculture is carried out. Regarding the concrete advice for the organization, it would be appropriate that the department in Canton which will be the main organ for the supporting project of those organizations in the future carries out it through the preparations and implementation of the project because it is more effective to carry out it on the premise that the project will be implemented. Also, in those organizations with desires and will to work, it is possible to increase the value of their agricultural products, introducing processing into the activities of shipment and sale. Moreover, if plural units carry out similar activities in a region, they can unify their activities and form federation in wider area, which will be able to develop bigger scale of cooperative shipment, processing and sale toward the regional market including the neighboring cities.

Because the scales of the groups of supporting small-scale farmers are mostly small, relatively big-scale projects, which are composed of beneficiaries of plural groups are more effective. Since in the sale and distribution, the bottle neck is the transport from communes in mountainous regions to the regional market, the administration of public buses/ trucks, the construction of collection and shipment / processing centers, etc. are considered in addition to the improvement of highways as the improvement works of infrastructure.

Model 3: Introduction and establishment of intensive agriculture as community/rural development

Objective: Sale to international markets, establishing the system of cooperative production/shipment/ processing

Regarding the small-scale farmers who produce only cash crops or dairy products, the existent ways of the shipment and the processing shall be revised from the viewpoint of increasing the added value of the agricultural products. The excellent agricultural products can be sold not only to the domestic market but also to the international market. Then the cooperation with the distributors becomes important. In general, the actual transactions are carried out by the companies created by farmers' groups while the administration is required to provide information on the related transaction/ dealers and the related supporting services including related institution/ standard and credit.

It is necessary for the processing/ selling companies to apply these services for developing new sales channel and choosing the best combination of channels, considering the possible risks. It is considered that the demand of agricultural products, which conform to the needs of consumers, who request safety and security for food, will continue growing. Lately major food makers and supermarkets are cooperating with farmers.

As for the processing, it will be necessary to improve the commodities, focusing on the raising of the quality. Although it is difficult to compete with the products of the major makers, it will be possible to develop products, which can conform to the local needs if the processing is directly connected to the agricultural production and the characteristics of regions are applied to the processing. It is believed that a brand, which can obtain confidence of consumers, will be made little by little if delicious and healthy products are kept on selling at a reasonable price instead of the easy production of low-price products. Also, the provision of intermediate products in coordination with a major maker is one way of business, which can be expected to raise the technical capacity and the capital through the cooperation.

In relation to the safety of processed foods, the consumers seek secure products even if these are little more expensive because they have been pestered with coarse products with insufficient hygienic management. So the commodity brands of the major companies are established as the indicator of food security. Certain level of hygienic management in the food processing is indispensable since the consumer consciousness of the food safety is high. It is possible to elevate the value of the products, offering information on the quality management as well as the production and sale of safety products.

Table 5.5.5.1 Development objectives for farming models in the sale and the distribution

Advice and supervision	Canton				Province		MAGAP	
	Organization	Cooperative shipment	Local market	Cooperative processing	Regional market	Coordination with processors/distributors	Export	International market
Model 1	→							
Model 2		→						
Model 3		→						

(4) Example of necessary technique in development policy

Development policy: Stable production of foods for self-consumption and improvement of the productivity < Cooperative shipment of raw milk >
Contents of the technique: Farmers who raise one or two milk cows can sell a few liters of raw milk daily besides the milk for the self-consumption. In communities, the farmers who can sell raw milk even if the amount is small shall organize groups and ship them cooperatively.
Necessity: A prompt counter measures are expected to the farmers who have milk cows but cannot ship the milk because the situation is losing the valuable opportunity to obtain cash. The milk cows are limited assets for small-scale farmers and if they can use them effectively, it will generate their incomes. Also, the shipment of raw milk is a promising business since it will open the way to the processing of dairy products.
Considerations: To elevate the profitability of the business, it is necessary to ship the product stably at a high price and reduce the cost of the transport. The farmers have to secure plural shipping destinations and change them depending on the situation. Also, the standard of hygiene required by the destinations should be fulfilled.

Development policy: Introduction and establishment of cash crops with handicraft manufacturing < Production and sale of high-quality cheeses >
Contents of the technique: To increase the profitability, the quality of cheese has to be improved. Also, the variety of products has to be increased and the marketing activities should be diversified. These improvements can make characteristics, which are different from other traditional workshops of fresh cheese.
Necessity: High-quality cheese has a high value added. Particularly the demand of mozzarella, which is mainly used for pizza, is growing in accordance with the increase of the consumption of pizza in these days. It is important to challenge the processing of high-quality cheese, whose demand is expected to continue growing, in order to avoid the regional excess of the production of traditional fresh cheese. The achievement of the production of high-quality cheese allows the sale of the commodities of high value added, which is expected to increase the profitability of the business.
Considerations: It is difficult to make high-quality cheese by only participating in the training courses of the processing of high-quality cheese held by the private sector. Therefore, it is necessary to develop a practical support, such as the preparation of extension programs in each technical level by each province, training courses held by each canton, etc.

Development policy: Introduction and establishment of intensive agriculture as community/rural development < Cooperative shipment and sale of vegetables to markets in wide area >
Contents of the technique: The attainment of a considerable volume of shipment and standardization of the quality through the organization allows a sale to markets in wide area. The members of the groups can reduce the production cost by cooperative use of big machines, and self-production of seeds/ fertilizer. They can also increase the value of their products by introduction of natural farming, which conforms to the needs of consumers, and contriving measures of washing and cuts of the products.
Necessity: The constant provision of good-quality vegetables develops the brand of the producing region, which raises the value of the vegetables and allows profitable sale. In the case of export, if the brand of Ecuadorian vegetables is created, it can be applied in the sale of other national agricultural products. It is observed in the case of the export of broccoli that the small-scale farmers who practice intensive farming are able to cultivate vegetables that complete the international standards, practicing revolving cultivation and the reduction of agricultural chemicals if a realistic plan is shown. To proceed to the project, applying the projects of agricultural support institutions, it is efficient not only for the financing but also collecting information and creation of the network for finding new markets.

<p>Development policy: Introduction and establishment of intensive agriculture as community/rural development < Cooperative shipment and sale of vegetables to markets in wide area ></p>
<p>Considerations: The operation plan including the facilities shall be formulated, which will allow the farmers to adjust their products after the harvest and ship them by themselves, using the shipping centers, without employment of new workers for the works. Also, it is important to have wide sources of information for making effective plan of marketing, such as distribution / food processing unions and institutions of agricultural support in addition to MAGAP and counties.</p>

Development policies	Other necessary techniques
Stable production of foods for self-consumption and improvement of the productivity	Production of fresh cheese; cooperative shipment of guinea pig / quinoa; mill of grains and legumes
Introduction and establishment of cash crops with handicraft manufacturing	Production and sale of yogurt; processing and sale of guinea pig; cooperative shipment of blackberry; production and sale of fruits pulp
Introduction and establishment of intensive agriculture as community/rural development	Processing and sale of milk; production and sale of fruit-yogurt; cooperative shipment and sale of strawberry; development of processed products of quinoa

5.6 Model Project guided to reduction of poverty

The present Study identifies four challenges faced by small scale farmers regarding agriculture and animal husbandry: 1) collapse of sustainable use of soil, 2) loss of native crops and genetic degradation, 3) difficulty in proper commercialization of agricultural products surplus and 4) delay in the associativism of farmers, base of the value chain. Besides, as guidelines of support to small scale farmers the following is proposed: 1) importance of routine extension activities, 2) soil fertility maintenance and improvement and soil conservation and 3) articulation of projects. Furthermore, in Chapter 5 the techniques required by each particular specialization are clarified.

On the other hand, in the framework of the Reorganization Plan for the support to small scale farmers that is the main objective of the present Study, the creation of Agricultural Forums at Municipality and Province levels for the promotion of a co-management system accordingly to the TAP developed by the government of Ecuador is proposed.

Proposals of concrete projects are indispensable to make good use of the technical problems and the co-management system, in order to improve the feasibility of the new co-management system. So that it is necessary to formulate the model projects measured to the challenges faced by small scale farmers through the direction of support for small-scale farmers.

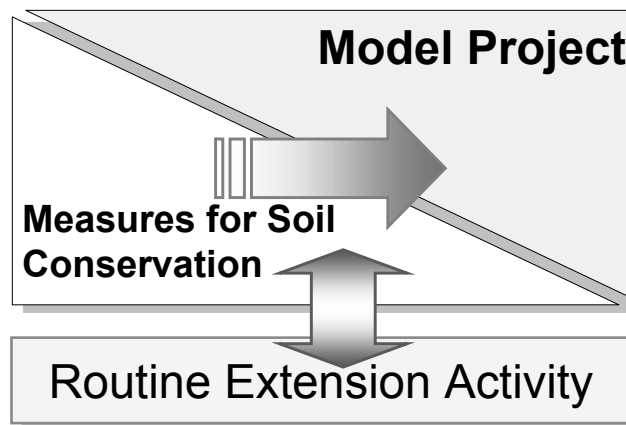


Figure 5.6.1 Relation among the three challenges

Following, samples of the model projects focused in “soil conservation”, “sales/commercialization” and “environmental conservation” are presented in the view point of “Support to sustain the effect” and “Support to appear the effect”, in order to formulate the model projects articulated various support.

Table 5.6.1 Direction of Support for Small-Scale Famers and Model Projects with Executing Entities

Direction of Support for Small Famers	Model Projects with High Priority	Executing Entities
Permanent Extension	<ol style="list-style-type: none"> 1. Extension of simple Techniques to countermeasure soil erosion 2. Implementation of participatory rural development using the ERA's 	<ul style="list-style-type: none"> • MAGAP, Provincial and Cantonal government • ERA's
Production Base	<ol style="list-style-type: none"> 3. Development of irrigation facilities inventory 4. Development of inventory of traditional varieties (agriculture, livestock) 	<ul style="list-style-type: none"> • INAR and provincial government • INIAP
Articulated Projects	<ol style="list-style-type: none"> 5. Environmental Agriculture 6. Road Station 7. Agrosilvopastoral Project 	MAGAP, provincial and cantonal government, and related institution/organization

Model Projects and Direction of support for Small-Scale Farmers

It is evident that low productivity of small scale farmers in the Sierra region is mainly due to soil. As soil degradation is a phenomenon that occurs in a long time, farmers tend not to be aware of its importance. Even if, farmers understand the problem of soil erosion to improve soil conditions, huge investments both in time and efforts are demanded; thus, certain motivation is required in order to make farmers begin the measures. Here is one of the importance of the routine extension activities.

In Chapter 5, concrete techniques for soil improvement are described and most of said techniques to improve soil can be solved by the same farmers as long as they have the will to do it; moreover, if they coorespond in the group, in the conservation of micro-watershed is also possible. It is important for supporting entities to show in site concrete cases. There are many previous experiences about soil conservation and MAGAP extension agents should collect such experiences

to inform farmers about the importance of soil improvement and its effect by priority. It is urgent that ERA promoters in cooperation with the extension agents work actively in regard to soil conservation issues provide for demonstration farms in the communities and show the specific results to the farmers.

Even if any farm production is done in farmland advanced by the soil deterioration, an enough result amount be expected, therefore it is necessary to consider that kind of farm land should be excluded from the project, or project should be combined with other projects introducing soil conservation measures.

An integral agricultural development plan ranging from production to commercialization can be implemented only at the farm land secured high productivity; it also raises small scale farmers' enthusiasm and enables to stop rural defragmentation. It is expected that the Project Models mentioned below could be developed in communities that have already solved soil degradation problems, or developed as a set together with the implementation of soil conservation measures.

Model Project 1 (Permanent Extension): Extension of simple Techniques to countermeasure against soil erosion

Title	Extension of simple techniques to countermeasure against soil erosion
Superior Goal	Preserve the soil as the basis of farming for farmers in the region Sierra
Objective	Extend simple techniques against soil erosion which can be applied by the producers themselves for the farmers in the Sierra region whose agricultural productivity decrease.
Results	<ol style="list-style-type: none"> 1. Set a management committee against soil erosion at the provincial level, and select target producers for technical transfer within the community or association of producers 2. Transfer Technical guidance to producers through theoretical and practical classes and visits to developed region. 3. Set goal of activities related to countermeasure against soil erosion within the target communities by extension recipients of technical transfer. 4. Extend the techniques to the communities and associations through the recipients of technology transfer principally in accordance with the goals of outputs, also monitor a progress of the extension.
Executing entity	Facilitators of ERA's and provincial staff of MAGAP, Responsible person of Agriculture development in the Provincial and Cantonal government. It is necessary for them to receive some support and collaboration with INIAP.
Execution period	First phase (two years) are achieved result 1 to 3 and then technical assistance and transfer in the permanent extension will continually be updated.

Model Project 2 (Permanent Extension) : Implementation of participatory sales & commercialization survey for rural development using the ERA's (Identification of Needs, Promotion of Asociation)

Title	Inventory Survey in Rural area
Superior Goal	Identify the agricultural strategy in the level of canton and province
Objective	Problems and challenges of the community and agricultural organization are identified and shared by habitants who live there.
Results	<ol style="list-style-type: none"> 1. Found and reformulate the rural organization (Community and Agricultural organization), and select leader or representative of group. 2. Elaborate the inventory list about socio-economic condition, natural condition and needs of the community. 3. Arrange problems & challenges, and its action from the view point of middle and long term together with the representative of the community and supporting institutions. 4. Develop the inventory list which should be classified into the matter solved by community itself and the matter required for government's support.
Executing entity	Facilitator and Provincial staff of MAGAP, Provincial Government, Cantonal Government
Execution period	Six months to One year

Model Project 3 (Production Base) : Development of irrigation facilities inventory

Title	Development of irrigation facilities inventory
Superior Goal	Become stable to produce agricultural products in province, implementing irrigation support smoothly and efficiently.
Objective	Develop an irrigation facilities inventory with identification of area irrigable, which in turn is to be used in the formulation of irrigation project and its implementation.
Results	<ol style="list-style-type: none"> 1. Develop an inventory list based on the implemented actual projects supported by the institutions related to support for irrigation projects. 2. Develop an inventory list of contractors and suppliers of materials for the construction of facilities 3. Develop an Inventory list of water rights including number of users, flow volume, water resource and irrigated area, type and size of facilities, products, land use, natural conditions and irrigation techniques. 4. To be used the inventories lists in the basic information for the monitoring and planning of irrigation projects in province. 5. Establish a structure to use and update the inventory in INAR and Provincial and Cantonal government, which in turn is to function to manage the structure.
Executing entity	INAR, Provincial and Cantonal government INAR It is necessary for them to collaborate with SENAGUA.
Execution period	One year

Model Project 4 (Production Base): Development of inventory of traditional varieties (agriculture, livestock)

Title	Development of inventory of traditional varieties (agriculture, livestock)
Superior Goal	Disseminate sustainable agriculture and livestock considering the environment of the Sierra region.
Objective	Develop the inventory of traditional varieties (agriculture and livestock) which adapt the agro-ecosystem of the Sierra region and have potential of high market value evaluate, and of necessary techniques for the varieties.
Results	<ol style="list-style-type: none"> 1. Develop an inventory of crop and animals which produced in the Sierra region traditionally 2. Develop an inventory of techniques and system used in the cultivation and livestock in the Sierra region traditionally. 3. Evaluate potential of usage of the inventory, and actual situation of species preservation and conservation. 4. Establish and function a structure and update the inventory within the INIAP.
	Potatoes, maize, quinoa, oca, melloco, mashua, tomato, babaco, llama, alpaca, fertilization methods, disease prevention, cultural practices, irrigation methods and other
Main products	INIAP and provincial offices of MAGAP
Execution period	Two years

Model Project 5: Environmental Agriculture

Title	Strengthening of Organic Production and Marketing by Small scale farmers.
Superior Goal	Dissemination of organic farming to small scale farmers, as alternative of agricultural development in the country.
Objective	Dissemination of organic farming techniques and establishment of a Participative Certification System of agricultural products in the provinces of Chimborazo and Tungurahua.
Results	<ol style="list-style-type: none"> 1. Establishment of organic farming platform at province level. 2. Assignment and formation of organic agriculture Promoters. 3. Creation of a Participative System of Technology Dissemination through actions of the Promoters. 4. Creation of a Participative Certification System at province level. 5. Dissemination of the system of Promoters and Participative Certification to other provinces.
Executing entity	Environmental Agricultural Table of the Province Agricultural Forum (province offices of MAGAP, province and municipalities governments, NGOs, etc.).
Execution period	Three years

Modelo Project 6: Road Station

Titile	Project Road Station of Parroquia _____ in Chimborazo Province
Superior Goal	Improvement of small scale farmers and rural population living conditions with regional economic reactivation through the “Road Station” project.
Objective	<ol style="list-style-type: none"> 1. Build “Road Stations” in potential trunk roads to function as place to rest, issuing place for local information and regional coordination as a space for direct contact between consumers and producers. 2. Achieve sustainable administration of “Road Stations” through participative organizations for direct sales of small scale farmers and rural population production
Results	<ol style="list-style-type: none"> 1. Creation of the Road Station Project Commission at province level in the Province Agricultural Forum. 2. Identification of potential “Road Stations” candidates and budget to build the same. 3. Creation of participative management organizations at parroquia level with the identification of the “Road Station” project beneficiary zones. 4. Direct sales of local products with the construction of “Road Stations”. 5. Opening of the “Road Station” with the function of rest place, issuing information and regional coordination.
Executing entity	Road Station Project Committee of the Province Agricultural Forum and corresponding municipal and parroquia governments.
Execution period	Three years

Model Project 7:Agrosilvopastrial Project

Titile	Agrosilvopastoral project for soil fertility sustainability and improvement and soil conservation at province level
Superior Goal	Reduction of poverty through soil fertility sustainability and improvement and soil conservation, base of agricultural activity of farmers at canton level.
Objective	Directed to small producers carrying out farming activities at low agricultural productivity zones, by introducing integrated agrosilvopastoral activities for soil fertility sustainability and improvement and soil conservation, at micro-watershed level.
Results	<ol style="list-style-type: none"> 1. Establishment of a project implementation committee among concerned entities to identify target areas with low agricultural productivity due to soil erosion and awareness-raising of farmers 2. Selection of an organization and one community in the target area to establish the project implementation system. 3. Clarification of methodology and objectives to introduce crop rotation, fodder production, green manure, reforestation, animal farming, and measures against soil erosion at the short, medium and long term, and project implementation based in short term objectives 4. Establishment of an implementation system by clarifying the land use plan in the zone for the medium and long term and the objectives of the measures for agrarian land.
Executing entity	Canton government, Parroquia government, province government, MAGAP, INIAP and related entities
Execution period	Three years Alter the Project period, beneficiaries will forced to operate and maintain the project in order to achieve the middle and long term objective of the project.

Chapter 6

Conclusions and Recommendations

Chapter 6 Conclusions and Recommendations

6.1 Conclusions

This Report presents the results of the Study which was elaborated based on the investigation and analysis together with International Cooperation of MAGAP, the main counterpart during the period of February of 2009 to August of 2010.

Summary of the Study:

The primary objective of the Study was to elaborate the inter-institutional reorganization plan of a supporting system for small-scale farmers in order to support them more effectively and efficiently. However, big changes arose in the original assumptions during the period of the Study. This implied that there would need to be changed in the content of the plan in which the change that posed the biggest challenge has been the new need to create a System of institutional linkage among the institutions involved in supporting small-scale farmers.

The institutional linkage, such as joint cooperation at the regional level, among MAGAP central headquarters, MAGAP provincial offices, and the provincial, cantonal and parroquial governments, is indispensable for the giving of support to small-scale farmers. Therefore, an "Agricultural Forum" and "Agricultural Round-Table Conference" have been proposed as vehicles for promoting and instilling Cooperation between the several institutions supporting the small-scale farmers. This proposal was brought forward through the formulation of the "National Plan for Rural Good Life" in MAGAP and the advances of the "Territorial Arrangement Plan" in the rural regions. Agricultural technology and services necessary for the small-scale farmers are also proposed in the Report.

"National Plan for Rural Good Life" and the "Agricultural Forum" and "Agricultural Round-Table Conference":

After the establishment of the New Constitution and the elaboration of the "National Plan of Good Life" in the hands of SENPLADES, MAGAP elaborated the "National Plan for Rural Good Life", in which it is intended to achieve the "Good Life" in the rural areas duplicating the productivity of the basic grains of the small-scale farmers and increasing their income by means of integral approaches for the support of the small-scale farmers.

The central authorities, such as MAGAP, that are managing public policy are demanding the formulation and implementation of policies that would mandate sectoral administration. The policies of the central authorities related to regional development should be implemented in the place where the development is taking place by means of a coalition of the representatives of the Territorial Arrangement Plan and the National Politics, because what is needed is to create a mechanism whereby the local governments that come to be the implementing bodies of the regional development, and the central authorities can work together properly with all the other

entities engaged in regional development including issues such as coordination and technical support.

The "Agricultural Forum" and "Agricultural Round-Table Conference" are organizations that work for this end. The policies of MAGAP will be incorporated into the "Territorial Arrangement Plan" of the local governments and implemented by the organizations that are executing regional policy such as the Provincial councils and the Municipalities.

Institutional linkage system among related entities to assist small-scale farmers required in the realization of the Territorial Arrangement Plan:

At the moment, a paradigm shift in regional development is in progress in the country. In the past, the most important thing was for the supporting side of the public sector to provide services more efficiently and effectively in agricultural development and support for the poor small-scale farmers. But now, responsibility of the provincial and municipal governments in the regional development has increased greatly with the advances of the decentralization, and the concept of the "Territorial Arrangement Plan" has been established for the regional development. Therefore it is now necessary for all the entities engaged in agricultural development to cooperate with the private sector and the beneficiaries' groups. That is to say, the regional administrations will need to operate in a coordinating capacity in the development from now on, more than before.

At the moment the "Territorial Arrangement Plan" at the municipal level is in the process of formulation in the country, but in spite of the constant support from the provincial governments and SENPLADES, it is not easy for the municipal governments to elaborate this Plan and they have been faced with a process of trial and error and it is expected that this will continue into the future before it settles down.

As the Territorial Arrangement Plan is an important and basic plan to formulate a mechanism to promote and instill institutional linkage among the local and central governments and the other related entities to promote regional development, it is necessary that the provincial governments and MAGAP coordinate in the planning of the agricultural sector of the Territorial Arrangement Plan and support the municipal governments immediately by means of their knowledge and technical experience regarding agricultural development. On the other hand the provincial governments should also develop the Territorial Arrangement Plan at the provincial level recapitulating the Territorial Arrangement Plans elaborated by the municipal governments; therefore, the cooperation between the municipal governments and MAGAP is an indispensable aspect.

Foundation of the "Promotion Unit of the Agricultural Round-Table Conference":

Once it is functioning, the proposition mentioned in the report will become an institutional linkage system that includes all the actors for agricultural development to achieve the "Good

Life" which is established as a national goal in the "New Constitution" and the "National Plan for "Good Life" and it could be a policy of the agricultural sector. That is to say, to diffuse at national level the proposed would come to be the rector that originally corresponds to MAGAP. For these reasons, just as described in this Report, MAGAP should immediately put in place a Promotion Unit for the foundation of the Agricultural Round-Table Conference, and along with the provincial and municipal governments and other interested organizations, should establish an institutional linkage system through its provincial offices that are distributed across the entire nation.

Improvement of the Internal Management System:

Various projects have been executed in the Sierra region up to the present, but there is no system that adequately allows reflecting the lessons learned from the previous projects into the new projects to be undertaken. Additionally, when the projects supporting the small-scale farmers are being executed under the institutional linkage system it will be necessary to have an instrument so that each institution understands the projects in common among them. Therefore, it is necessity that MAGAP and the provincial governments adopt the Plan for Improvement of the Internal Management System as proposed in the Report.

Techniques required by the poor small-scale farmers

The problem of poverty in Ecuador stands out particularly in the rural areas of the Sierra region. The following four agricultural issues that affect the small-scale farmers should be pointed out; "1) Collapse of sustainable land use", "2) Loss of local crop products and degradation in the inherited character of those local crop products", "3) Difficulty in selling surplus products", and "4) Fragility of the farmers' organization that is the base of constructing the value chain". To achieve the prompt creation of the Institutional linkage System that is proposed for the Sierra region and to achieve visible results from this System, it is indispensable to identify the specific techniques that the small-scale farmers of the Sierra region require to mitigate these four issues and also to propose model development projects based on these required techniques.

Techniques related to the cultivation, animal husbandry, soil conservation, small scale irrigation, and marketing and commercialization are proposed by establishing the guidance for the support to the small-scale farmers toward: "1) stable production for self-consumption and improvement of productivity", "2) introduction and establishment of cash agriculture", and "3) introduction and establishment of the intensive agricultural practices presupposes a certain quantity of investments to promote those practices to promote community and regional development.

6.2 Recommendations

The results of the Study are integrated into "creation of the institutional linkage system among organizations related to support the small-scale farmers" and "techniques necessary for the poor small-scale farmers". Based on these results, the following recommendations are presented;

Foundation of Promotion Unit for Creation of Round-Table Conference:

- MAGAP should immediately found a "Promotion Unit for Creation of a Round-Table Conference" as proposed in the Report.
- This Promotion Unit shall consider the staff assignments so as to be able to apply their experiences that they gained in the Provincial Office of Tungurahua that already is applying a similar System as good practice.
- The Promotion Unit should disseminate the knowledge regarding the Territorial Arrangement Plan. Also it should transfer this knowledge to those in charge of the Provincial Offices of MAGAP and their own staff working at the canton level so that MAGAP can take the initiative in creating the Institutional linkage System at the municipal and provincial levels.
- In this creation, it is necessary for the Promotion Unit to work with the provincial governments, and if possible, also with the municipal governments regarding application of plans concerning the Improvement of Internal Management in each institution.

Improvement in ERA's:

- MAGAP should sufficiently take into account the aspects to improve and the future considerations of the ERA's proposed 2.4 SWOT analysis regarding ERA'S and also the Recommendations in Chapter 2 of this Report and should apply them in the future activities.

Guidelines for the support to small-scale farmers:

- The local governments and MAGAP should reflect in the Territorial Arrangement Plan the three themes of the support proposed in "2.3 Guidelines for Support to the Small-scale Farmers" in Chapter 2 of the Report ("importance of the routine extension activities", "maintenance and promotion of the fertility and conservation of the soil" and "articulation of the projects").

Techniques necessary for the poor small-scale farmers

- It is important to apply in the Territorial Arrangement Plan the diverse techniques dedicated to the small-scale farmers proposed in Chapter 5 of the Report, articulating it organically according to the realities of the area. In practice, the Plan should be carried out particularly considering the rural depopulation and the focus gender among other aspects.

Annex



Table 4.2.1 Form of Territorial Intervention of MAGAP

SUBSECRETARY OF PLANNING	Form DPP-IT-01
-Form of Territorial Intervention -	

1. Data of Program or Project			
Name of Program:			
Name of Project:			
Applicant Entity:			
Location:	Province:	Canton:	Parroquia:
Amount of Project:	Fiscal Contribution:	Local Tally Contribution:	Other Tally Contribution:
Field of intervention:	<input type="checkbox"/> Agriculture <input type="checkbox"/> Livestock <input type="checkbox"/> Aquaculture <input type="checkbox"/> Fishery <input type="checkbox"/> Forest		
Type of Intervention :	e.g.) Productive development		
Intervention in Productive Process:	<input type="checkbox"/> Productive Availability Factors <input type="checkbox"/> Creation of association for small-scale farm producers <input type="checkbox"/> Rural Extension <input type="checkbox"/> Production <input type="checkbox"/> Storage <input type="checkbox"/> Internal Commercialization <input type="checkbox"/> External Commercialization <input type="checkbox"/> Consumption <input type="checkbox"/> Others (Specified):		

2. Analysis of Programs or Projects					
Impact to beneficiaries and generation of employment	Excellent	Good	Regular	Bad	Nonexistent
Creation of new work plazas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvement of rural workers' revenues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvement of levels of rural population's consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improvement of levels of urban population's consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employment generation and/or opportunities for women	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Creation and/or improvement of productive capacities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Creation and/or improvement of organizational capacities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Replica of the Project in other lolutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Issues Covered and Localization of the Program or Project	Excellent	Good	Regular	Bad	Nonexistent
Attention to rural groups located in poverty stricken areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attention to micro and small scale farmers and coastal communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attention to towns and nationalities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attention to legally established groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attention to informal groups of agricultural producers and/or fishermen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Linking with plans for local development	Excellent	Good	Regular	Bad	Nonexistent
Areas of planning (SENPLADES)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provincial Council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Municipalities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parroquia Council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beneficent institutions / NGOs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analysis of Offerings and demand	Excellent	Good	Regular	Bad	Nonexistent
Availability of talented human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of organizational capacities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appropriate and sustainable use of local natural resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The demand for goods and services referring to basic necessities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Goods and services offered to fill existent unsatisfied demand (consumption)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of goods and services offered due to the project or due to the project's efforts to overcome the existing obstacles to production in the territory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conclusions	a. b. c. d. e.				
Recommendations	a. b. c. d. e.				

3. Responsible Data for Analysis			
Unit:	e.g.) Sub-secretary of Aquaculture		
Dependence:			
	Elaborated for:	Revised for:	Approved for:
Signatures of Responsibility:			
Name of the Official:			
Charge of the Official :			

Table 4.2.2 Form for Territorial Intervention regarding the provincial governments' projects extracted from the document of MAGAP

MINISTRY OF AGRICULTURE, LIVESTOCK, AQUACULTURE AND FISHERY												
ADDRESS OF INSTITUTIONAL PLANNING												
ANNUAL INSTITUTIONAL OPERATIVE PLAN 2009												
INSTITUTION : PROVINCIAL AGRICULTURAL ADDRESS OF COLTA												
OBJECTIVE OF THE NATIONAL PLAN OF DEVELOPMENT: (Mark the correspondent one)												
1.	To favor the equality, cohesion and social Integration	7.	To build and to strengthen the public space and of common encounter									
2.	To improve the capacities and potentialities of the citizens	8.	To affirm the national Identity and to strengthen the diverse identities and inter-cultural harmony									
3.	To increase hope and the quality of life	9.	To foment the access to justice									
4.	To promote and to guarantee a healthy and sustainable atmosphere	10.	To guarantee the access to public and political participation									
5.	To guarantee peace and the national sovereignty	11.	To establish a solid and sustainable economic system									
6.	To guarantee availability of stable, fair, and worthy work	12.	To reform the state for the collective well-being									
Goal(s) of Objective(s) of National Plan of Development : TO INCREASE THE AGRICULTURAL PRODUCTION												
Indicator (s) of Objective(s) of National Plan of Development : TO REACH A GROWTH OF 1.5% IN THE AGRICULTURAL SECTOR												
Activity Code	Name of Activity according to the Catalog	Annual Goal	Programming of Goals Quarter (in percentage)			Geographical Environment	Means of Verification	Number of Beneficiaries	Programming of the Expense US\$			
			I	II	III				Yearly Total	I	II	III
BY-PRODUCT 1 CULTIVATION of MAIZ												
a) Promotion												
	To promote access to credit at the producers' level	5	1	2	2	Canton	Documents	150	230	46.1	92.1	92.1
b) Technical Assistance												
	To offer technical assistance for good agricultural practices for the basic basket of crops	10	3	4	3	Canton	Reports		460.6	138.2	184.2	138.2
	To promote alternative technologies for the transition of traditional agriculture to some organic and ecological crops of short cycle	5	2	2	1	Canton	Reports		230.3	92.1	92.1	46.1
	To enable in the production of wholesome corn for food						Reports					
	To promote the planting of new varieties of corn for direct consumption and to supply the food industry	5	1	1	3	Canton	Reports		230.3	46.1	46.1	138.2
	To expand the use of certified corn seed	8	1	4	3	Canton	Documents		368.5	46.1	184.2	138.1
c) Qualification												

Activity Code	Qualification events (Courses, conferences, observation tours, field days D.M.)	4	1			Canton	Reports	184.2	46.1	92.1	46.1	
			1	2	3							
Name of Activity according to the Catalog	Work, Activities, Products, Programs	Annual Goal	Programming of Goals Quarter (in percentage)			Geographical Environment	Means of Verification	Number of Beneficiaries	Programming of the Expense US\$			
			I	II	III				Yearly Total	I	II	III
d) Associative	To support associations: formation and invigoration of agricultural producers' organizations	5	2	1	2	Canton	Documents	230.3	92.1	46.1	92.1	
e) Support commercialization	To qualify, support and negotiate commercialization of the basic basket products	4	1		3	Canton	Reports	184.24	46.06		138.2	
	To qualify the post harvest handling to improve the quality and to give added value (corn)	3			3	Canton	Reports	138.2			138.2	
f) Formation of chains of agricultural products	Support the management of organic certification for the organizations of small and medium scale farmers					Canton	Reports					
g) Storage on the Farms	Qualification in storage of grains and seeds	4		1	3	Canton	Reports	184.2		46.1	138.2	
h) Other Actions	Inter-Institutional Coordination	6	2	2	2	Canton	Reports	276.4	92.1	92.1	92.1	
		59						2,717.24	TOTAL EXPENSES			

Table 4.2.3 Project Profile Form for PPCH 2010

1. NAME OF THE PROJECT:
 - 1.1. LOCALIZATION:
 - 1.2. ORGANIZATIONS OF BENEFICIARIES:
 - 1.3. PARTICIPANT FAMILIES OR DIRECT BENEFICIARIES:
 - 1.3.1. No. Of participant families or direct beneficiaries
 - 1.3.2. No. Of participant families or indirect beneficiaries
 - 1.4. ORGANIZATION THAT ASSUMES THE CURRENT PHASE OF THE PROJECT:
 - 1.5. NAME OF THE LEADERS RESPONSIBLE FOR THE PROCESSES:
 - 1.6. Address, telephone number and e-mail of the responsible leaders:

2. MAIN PROBLEM TO BE SOLVED WITH THE PROJECT:

3. ANTECEDENTS AND JUSTIFICATION:

4. DESCRIPTION OF THE PROJECT:

5. GENERAL OBJECTIVE:

6. SPECIFIC OBJECTIVES:

7. EXPECTED RESULTS FOR THE PROJECT (Qualitative indicators):
 - 7.1. Result 1:
 - 7.2. Result 2:

8. EXPECTED PRODUCTS FOR THE PROJECT (Quantitative indicators):
 - 8.1. Product 1:
 - 8.2. Product 2:
 - 8.3. Product 3:

9. DETAILED BUDGET OF THE PROJECT :

- Detail of the products to be acquired.
- Quantity and costs of the products.

ITEM	UNIT	QUANTITY	UNIT VALUE USD	TOTAL VALUE USD
Total				

10. FINANCING OF THE PROJECT

ITEM	HCPCH	MUNICIPALITY	OTHERS
Total			

11. AUTHORIZING DOCUMENTS THAT ACCOMPANY THE PROFILE OF THE PROJECT:

- 11.1.- Records of Commitment of the Organization to the beneficiaries' name to contribute and to participate in the execution of the project.
- 11.2.- Contributions of each account of the project.
- 11.3.- In the event of irrigation projects, the award of the water rights.
- 11.4.- To carry out constructions and buildings, the deeds to the lands.
- 11.5.- In the case of the beneficiaries who are legally constituted and with artificial legal.
- 11.6.- In the case of accounts, certifications of the commitments acquired by the participating entities.

Date of completion:

SIGNATURE OF RESPONSIBLE PEOPLE

Table 4.2.4 Application Form for Cantons (Tungrahua Province)

I. Municipality of the Canton * * *

1. Name of the Proposal

Proposal of Implementation of the Agricultural Plan (Strengthening in the line of qualification and technical assistance) of Canton * * *	Duration	Month	Year
	Beginning	February	2010
	End	February	2013

2. Sponsor of the proposal

Name : Municipality of the canton * * * and * * * Provincial Government of Tungurahua.	
Organization Type	
X	Associations of Producers
	NGO of social development
	NGO of economic-social development
X	Sectional Autonomous Governments

3. Orientation of the Proposal

X	Social investment
X	Associative Commercialization
X	Implementation of a Center for Storing Milk
X	Production of services

4. Orientation to the market

Internal Market (National) + External Market (International)

5. Localization and characterization of the proposed area

Beneficiaries of the project

POPULATION OF AREA BY GENDER

	URBAN	RURAL	TOTAL	PERCENTAGE
<i>MEN</i>				
<i>WOMEN</i>				
<i>TOTAL</i>				

Source: INEC CENSUS 2001 and CANTONAL STRATEGIC PLAN 2007

6. Back Ground of the Proposal

7. Justification of the Proposal

AGRICULTURAL STRATEGIC PLAN OF CANTONAL OF * * *	PROGRAMS	IDENTIFIED PROJECTS
	1.- Social organizational strengthening	
	2.- Qualification and transfer of technologies	
	3.- Commercialization and agroindustry	
	4.- Emergency Actions	
	5.- Credit	

8. Objectives of the proposal

Objective:

9. Prospective results of the project and activities according to Components.

Component 1:		
Result 1.1:		
Activities 1.1: A 1.1.1 A 1.1.2 A 1.1.3		
Result 2:		
Activities 1.2: A 1.2.1 A 1.2.2		
Component 2:		
Result 2.1:		
Activities 2.1: A 2.1.1 A 2.1.2 A 2.1.3		
Result 2.2:		
Activities 2.2: A 2.2.1 A 2.2.2		

10. Indicators of achievement of the results of the Components

Component 1.

Result 1	
Indicator 1.1	
Indicator 1.2	
Indicator 1.3	
Result 2	
Indicator 2.1	
Indicator 2.2	

Component 2.

Result 1	
Indicator 1.1	
Indicator 1.2	

11. Budget of the Proposal

Results / Activities	Chronogram				Municipality * * *			HCPT		
	Sem 1	Sem 2	Sem 3	Sem 4	1 st year	2 nd year	3 rd year	1 st year	2 nd year	3 rd year
	Component 1									
Result 1										
A1.	xxxx	xxxx	xxxx	xxxx						
A2.	xxxx									
A3.	xxxx							xxxx		
A4.	xxxx									
Result 2										
A1.	xxxx									
A2.		xxxx								
Result 3										
A1.		xxxx								
A2.		xxxx								
Component 2										
Result 1										
A1.			xxxx						xxxx	
A2.		xxxx								
Result 2										
A1.	xxxx	xxxx								
A2.		xxxx							xxxx	xxxx

Results and Activities	Budget						Beneficiaries	Others
	Municipality ****			HGPT				
	1 st year	2 nd year	3 rd year	1 st year	2 nd year	3 rd year		
Subtotal								
Total tallies								
Total investment								

Annex: Technical Management of the Cultivation

Table 5.5.1.1. Yield and Revenues of Improved Varieties of Potato

Varieties	Yield ton/ha	Cost (A) US\$/ha	Revenues (B) US\$/ha	Gross Benefit (C=B-A) US\$/ha	Productivity (B/A)	Rate of Profitability (C/A) %
Gabriela	20.5	637	2,769	2,132	4.3	335
Esperanza	18.2	599	2,270	1,672	3.8	279

Source : Manuel Pumisacho y Stephen Sherwood, *El Cultivo de La Papa en Ecuador*, 2002

Table 5.5.1.2. Nutrients (g/100g) and Energy Value (k cal-100g) of Quinoa vs. Other Cereals

Contents	Quinoa	Wheat	Rye	Barley	Rice	Maize
Caloric value	350.0	309.0	269.0	299.0	353.0	338.0
Protein	13.8	11.5	8.7	10.6	7.4	9.2
Fat	5.0	2.0	1.7	2.1	2.2	3.8
Carbohydrate	59.7	59.4	53.5	57.7	74.6	65.2
Water	12.7	13.2	13.7	11.7	13.1	12.5
Fiber	5.2	10.6	13.2	9.8	4.0	9.2
Mineral	-	1.8	1.9	2.3	1.2	1.3

Source: FAO (Sven-Erik Jacobsen y Stephen Sherwood), *Cultivo de Granos Andinos en Ecuador-Informe sobre los rubros quinoa, chocho y amaranto-*, Julio 2002

Table 5.5.1.3. Content of Minerals (mg/100g) of Quinoa vs. Other Cereals

Contents	Quinoa	Wheat	Rice	Maize
Ca	66.6	43.7	23	15
Ph	408.3	406	325	256
Mg	204.2	147	157	120
K	1,040.00	502	150	330
Fe	10.9	3.3	2.6	-
Mn	2.21	3.4	1.1	0.48
Zn	7.47	4.1	-	2.5

Source: FAO (Sven-Erik Jacobsen y Stephen Sherwood), *Cultivo de Granos Andinos en Ecuador-Informe sobre los rubros quinoa, chocho y amaranto-*, Julio 2002

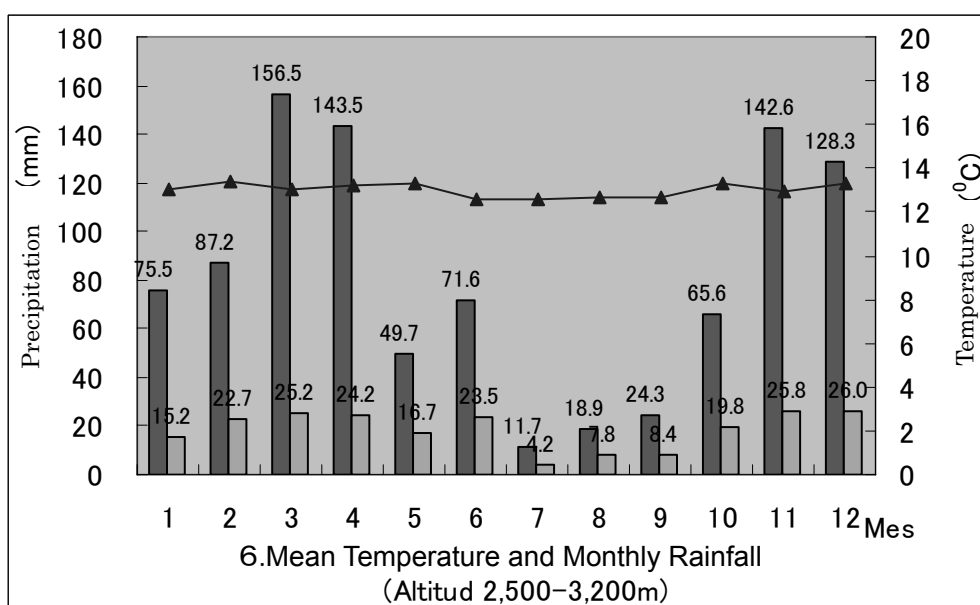
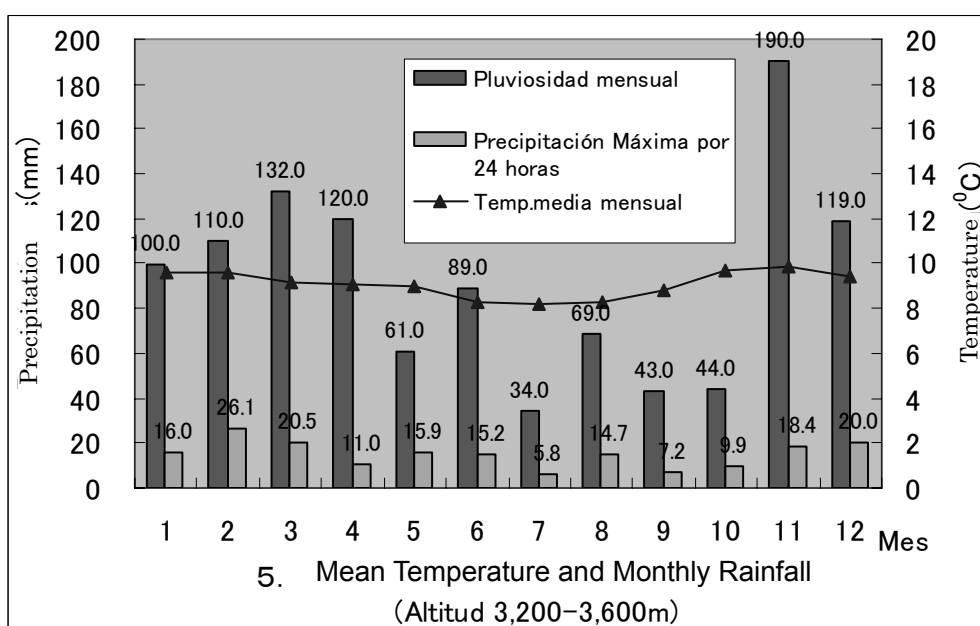
Table 5.5.1.4. Yield and Revenues of Chocho and Amaranto Crops

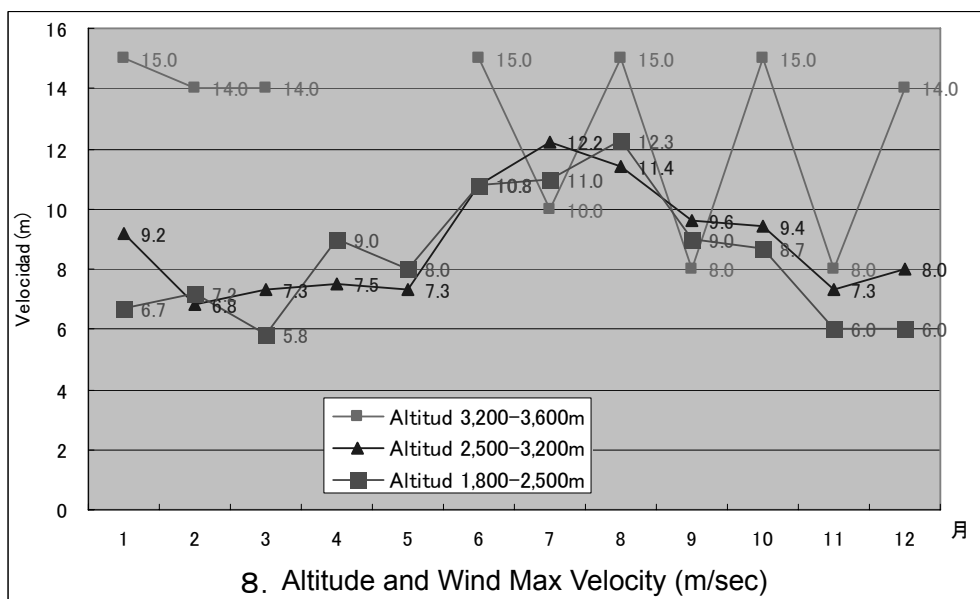
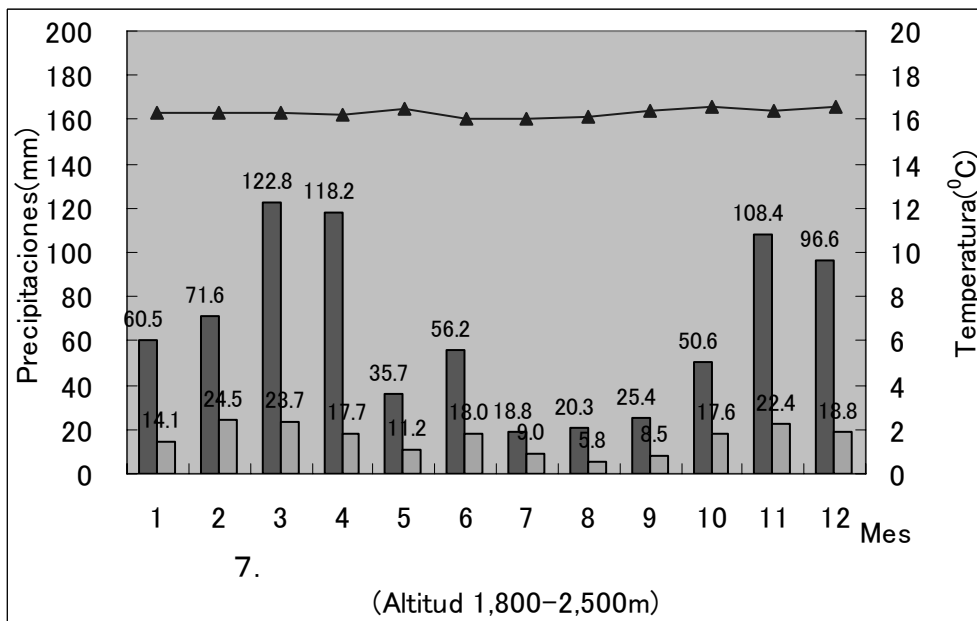
Crops	Yield ton/ha	Cost ^{Nota} (A) US\$/ha	Revenues (B) US\$/ha	Gross Benefit (C=B-A) US\$/ha	Productivity (B/A)	Rate of Profitability (C/A) %
Chocho	0.6	475	680	205	1.4	43.2
Amaranto	1.6	533	800	267	1.5	50.1

Note: En el Costo de producción de Chocho no se incluye los costos de mano de obra, mientras que en los índices del amaranto sí.

Source: FAO (Sven-Erik Jacobsen y Stephen Sherwood), *Cultivo de Granos Andinos en Ecuador-Informe sobre los rubros quinua, chocho y amaranto-*, Julio 2002.

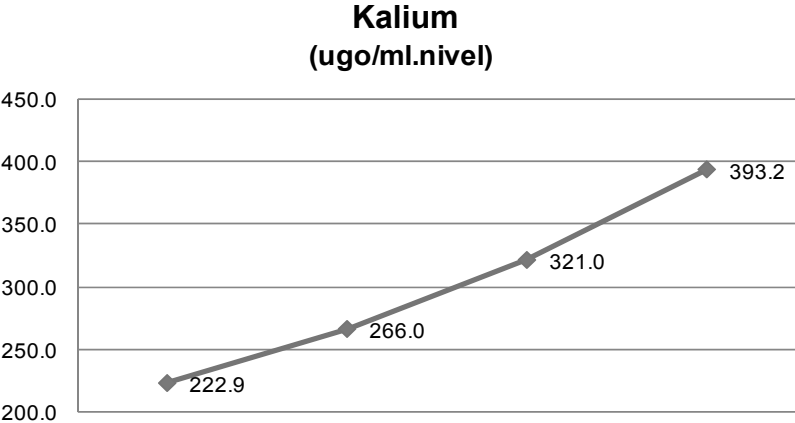
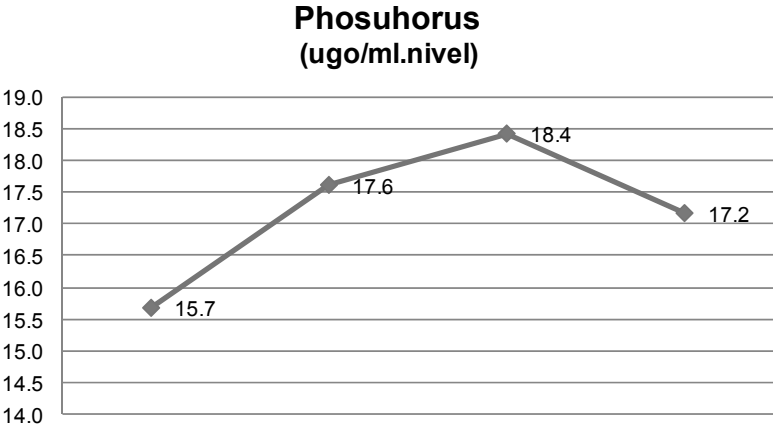
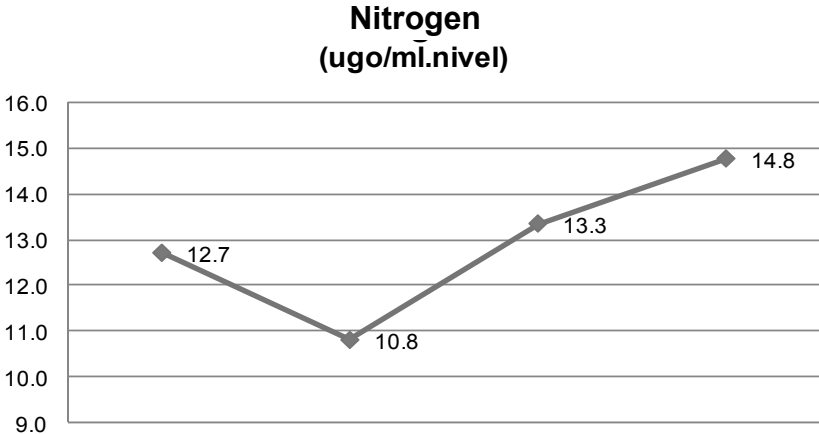
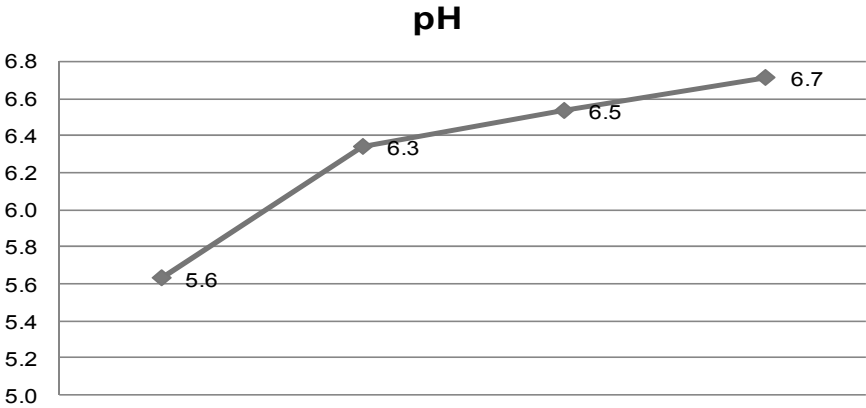
Table 5.5.1.5, 6, 7, and 8. Meteorological Data



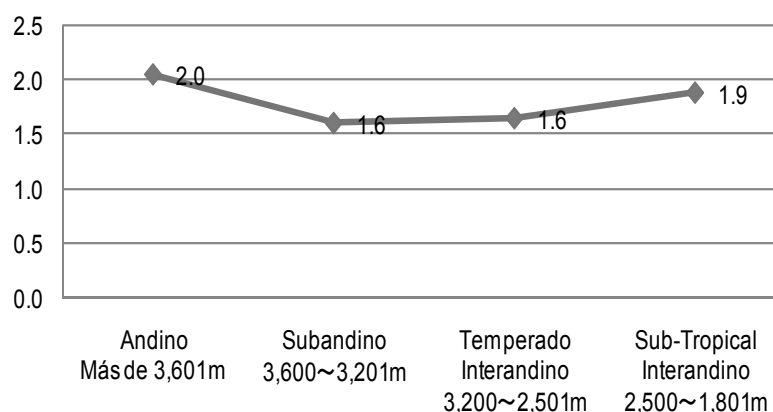


Source: Instituto Nacional de Meteorología e Hidrología, Anuario Meteorológico 2006. Nro. 46 Quito-Ecuador.

Table 5.5.1.9. Analysis of Soil of Chimborazo Province (Average)



Organic Matter (%MO Nivel)



Source: Mauro Guillermo Merino Saltos, *Los Microelementos en los Suelos Agrícolas Predominantes de la Provincia de Chimborazo y su Respuesta a la Fertilización a Nivel de Maceta*, Escuela Superior Politécnica de Chimborazo, 1990. Mario E. Oñate A., *Caracterización Físico-Química de los Suelos de las Áreas de Cultivos Andinos Marginales, en Chimborazo*, Consejo Nacional de Universidades y Escuela Politécnica, 1990

Table 5.5.1.10. Data of the Experimentations on Farming Method and Fertilization in Mixed Crops of Maize and Frijol in Provinces of Chimborazo and Pichincha (year 2003)

Experimentations		Direct Cost (US\$/ha)	Income (US\$/ha)	Gross Benefit (US\$/ha)
Farming	Fertilization			
Chimborazo Province				
Farming Zero	Non Fertilizer	136	847	711
Farming Minimum	Non Fertilizer	150	983	833
Farming Zero	Fertilizer Standard	237	1,637	1,400
Farming Zero	Fertilizer Standard + FZn	300	1,753	1,453
Pichincha Province				
Farming Zero	Non Fertilizer	136	230	94
Farming Minimum	No Fertilizante	150	249	99
Farming Zero	Fertilizer Standard	237	778	541
Farming Minimum	Fertilizer Standard	251	1,019	768
Farming Minimum	Fertilizer Standard + FC	289	1095	806
Farming Normal	Fertilizer Standard + FZn	526	1478	952

FZn = Foliar with Quelato de Zinc, FC = Foliar Completo

Source : INIAP, *Evaluación de sistemas de labranza de suelos y fertilización en la asociación maíz-fréjol voluble*, Boletín técnico No.121, 2004-Quito

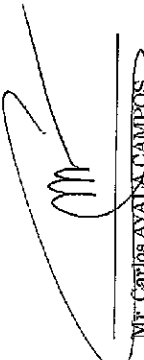
Minutes of Meeting

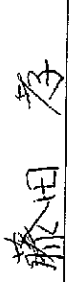
MINUTES OF MEETING
ON
THE INCEPTION REPORT
FOR
THE STUDY
ON

THE PLAN OF REORGANIZATION OF THE AGRICULTURE
SUPPORTING SERVICES, COPING WITH POVERTY
ALLEVIATION FOR RURAL PEASANT IN MOUNTAINOUS
AREA IN THE REPUBLIC OF ECUADOR

AGREED UPON BETWEEN
MINISTRY OF AGRICULTURE, LIVESTOCK, AQUACULTURE
AND FISHERIES
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Quito, 26, February, 2009


Mr. Carlos AYALA CAMPOS
Asesor Ministerial
Ministry of Agriculture, Livestock, Aquaculture
and Fisheries


Mr. Takashi FUJITA
Team Leader
JICA Study Team

In accordance with the Scope of Work for the Study on The Plan of Reorganization of the Agriculture supporting Services, Coping with Poverty Alleviation for Rural Peasant in Mountainous Area in the Republic of Ecuador (hereinafter referred to as "the Study") signed by the Government of the Republic of Ecuador (hereinafter referred to as "the Government") and the JICA Study Team on 26 February, 2009.

The JICA Study Team headed by Mr. Takashi FUJITA submitted and explained the Inception Report on 20 February, 2009, under the attendance of the JICA Advisory Committee headed by Mr. Sabro YAMAGUCHI, to the Government headed by Mr. Carlos AYALA CAMPOS and to the officials members involved to the present Study, at the same time exchange of opinions was made between the Ecuadorian side and the Study Team.

As the result of the said explanation and an exchange of opinions, the Ecuadorian side and the Study Team have agreed the following:

1. The Government received from the Study Team Thirty (30) copies of the Inception Report in Spanish.
2. The Study Team explained the Inception Report and the institutions related with this Study manifested the agreement of contents of the Inception Report and the Job Program of the JICA Study Team.
3. Both parts, (MAGAP and The JICA Study Team) confirmed the importance of assignment of counterparts. (In charge of each institutions for the Study)
4. The JICA Study Team requested office space with necessary facility for JICA Study Team to MAGAP.

This Minutes of Meeting is prepared in English and Spanish. In case that any discrepancy may arise between these two versions, the English version shall prevail over the Spanish language version.



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List of Participants

1. Ecuadorian side
 - 1) **MAGAP**
International Cooperation
Irene Schultdt Cooperation Asesor
Iwao Yamaxita International Cooperation Asesor
Maria Augusta Moscoso Cooperation Technical Team Member
Hector Jaramillo Cooperation Technical Team Member
Mercedes Astudillo Team Support Member
Planificación
Fausto S. Poveda R. Planning Technical Team Member
Jhesenia Albán Planning Technical Team Member
Chimborazo
Jorge Comfaro B Leader of Planning Division
 - 2) **INCCA**
Cesar Silva Director of Planification
 - 3) **INIAP**
Cristina Iglesia Coordinator of Transference Division
2. Japanese side
 - 1) **Japan International Cooperation Agency (JICA)**
Saburo Yamaguchi Resident Representative
Kiyoshi Hirozumi Assistant Resident Representative
Santiago Guerrero International Cooperation Officer
 - 2) **The JICA Study Team**
Takashi Fujita Team Leader
Kazuo Nagai Team Member
Akira Nakamura Team Member
Carlos Wakabayashi Team Member
Motoyo Araki Team Member



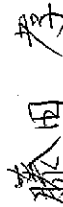
MINUTES OF MEETING
ON
THE PROGRESS REPORT
FOR
THE STUDY
ON
THE PLAN OF REORGANIZATION OF
THE AGRICULTURE SUPPORTING SERVICES,
COPING WITH POVERTY ALLEVIATION
FOR RURAL SMALL SCALE FARMERS
IN MOUNTAINOUS AREA
IN THE REPUBLIC OF ECUADOR

AGREED UPON BETWEEN
MINISTRY OF AGRICULTURE, LIVESTOCK, AQUACULTURE
AND FISHERIES
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Quito, 24, June, 2009



Mr. Carlos AYALA CAMPOS
Asesor Ministerial
Ministry of Agriculture, Livestock, Aquaculture
and Fisheries



Mr. Takashi FUJITA
Team Leader
JICA Study Team

In accordance with the Scope of Work for the Study on The Plan of Reorganization of the Agriculture supporting Services, Coping with Poverty Alleviation for Rural Small Scale Farmers in the Mountainous Area in the Republic of Ecuador (hereinafter referred to as "the Study") signed by the Government of the Republic of Ecuador (hereinafter referred to as "the Government") and the JICA Preparatory Study Team on 5 March, 2008, the Study has been commenced on February 2009 and will be finalized on July 2010.

The JICA Study Team headed by Mr. Takashi FUJITA submitted and explained the Progress Report on the meeting for the Conductor Committee held on 24 June, 2009, to the Government headed by Mr. Carlos AYALA CAMPOS and to the officials members involved to the present Study, at the same time exchange of opinions was made between the Ecuadorian side and the Study Team.

As the result of the said explanation and an exchange of opinions, the Ecuadorian side and the Study Team have agreed the following:

1. The Government received from the Study Team Thirty (30) copies of the Progress Report in Spanish.
2. The Ecuadorian side and the Study Team agreed on contents of the Progress Report.

This Minutes of Meeting is prepared in English and Spanish. In case that any discrepancy may arise between these two versions, the English version shall prevail over the Spanish language version.

List of Participants for the Conductor Committee

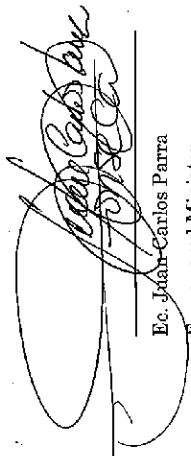
1. **Ecuadorian Side**
 - 1) **MAGAP**
Cooperación Internacional
Ing. Irene Schultdt
Iwao Yamaxita
Dra. María Augusta Moscoso
Lcd. Héctor Jaramillo
Tgl. Mauricio RIVERA J.
Subsecretaría de Planificación
Ing. Diego Viscaino
Subsecretaría Regional de la Sierra
Ing. Lucy Montalvo
Ing. Ángel Vaca Cazorla
Coordinadora
Asesor de Cooperación Internacional
Miembro de Equipo Técnico de Cooperación
Miembro de Equipo Técnico de Cooperación
Subsecretario
Subsecretaria
Coordinador de Fomento Agropecuario
 - Director de Desarrollo Rural**
Ing. David Espinoza
 - 2) **INCCA**
Ing. Rómulo Chávez
Dr. Luis Oña
 - 3) **INIAP**
Ing. Víctor Proaño
Coordinador de los Proyectos de Planificación
 - 4) **INAR**
Ing. Fernando Herrera
Director de Desarrollo
 - 5) **INDA**
Ab. Ec. Galo Aldaz
Director Ejecutivo
 - 6) **BNF**
Ing. Galo Paredes
Miguel Ángel Gonzales
Abdón Rodríguez
Sub Gerente de Capacitación y Transferecia
Asesor Capacitación
Asesor Seguros
2. **Japanese Side**
 - 1) **Agencia de Cooperación Internacional del Japón (JICA)**
Kiyoshi Hirozumi
Representante Residente Adjunto
 - 2) **Equipo de Estudio de JICA**
Takashi Fujita
Kazuo Nagai
Akira Nakamura
Motohiro Yasuhisa
Carlos Wakabayashi
Jefe del Equipo
Miembro del Equipo
Miembro del Equipo
Miembro del Equipo
Miembro del Equipo

MINUTE OF MEETING
ON
THE PROGRESS REPORT
FOR
THE STUDY
ON

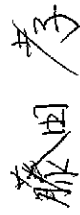
THE PLAN OF REORGANIZATION OF
THE AGRICULTURE SUPPORTING SERVICES,
COPING WITH POVERTY ALLEVIATION
FOR RURAL SMALL SCALE FARMERS
IN MOUNTAINOUS AREA
IN THE REPUBLIC OF ECUADOR

AGREED UPON BETWEEN
MINISTRY OF AGRICULTURE, LIVESTOCK, AQUACULTURE
AND FISHERIES
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Quito, 27, October, 2009



Ec. Juan Carlos Parra
Empowered Minister
Ministry of Agriculture, Livestock, Aquaculture
and Fisheries



Mr. Takashi FUJITA
Team Leader
JICA Study Team

In accordance with the Scope of Work for the Study on The Plan of Reorganization of the Agriculture supporting Services, Coping with Poverty Alleviation for Rural Small Scale Farmers in the Mountainous Area in the Republic of Ecuador (hereinafter referred to as "the Study") signed by the Government of the Republic of Ecuador (hereinafter referred to as "the Government") and the JICA Preparatory Study Team on March 5, 2008, the Study has been commenced on February 2009 and will be finalized on July 2010.

The JICA Study Team headed by Mr. Takashi FUJITA submitted and explained the Interim Report on the meeting for the Conductor Committee held on October 27, 2009, to the Government headed by Ec. Juan Carlos Parra and to the official members involved in the present Study, at the same time an exchange of opinions was made between the Ecuadorian side and the Study Team.

As the result of said, the Ecuadorian side and the Study Team have agreed to the following:

1. The Government received from the Study Team Thirty (30) copies of the Interim Report in Spanish.
2. The Ecuadorian side and the Study Team agreed on contents of the Interim Report.
3. All of the comments in the meeting will be utilized to improve the activities in the study.

This Minute of Meeting is prepared in English and Spanish. In case that any discrepancy may arise between these two versions, the English version shall prevail over the Spanish language version.



Participants List

Consejo Provincial de Cotopaxi
Delegado
Departamento Técnico
Técnico Delegado

Consejo Provincial de Tungurahua
Ing. Fernando Cofre

Consejo Provincial de Chimborazo
Ing. Roberto Ríos
Ing. Juan Carlos Arcellano

2. Japanese Sede

1) Equipo de Estudio de JICA
Takashi Fujita
Kazuo Nagai
Akira Nakamura
Motohiro Yasubisa
Carlos Wakabayashi

- 1. Ecuador Side**
- 1) MAGAP**
Subsecretaría de Planificación
Ec. Juan Carlos Parra
Cooperación Internacional
Ing. Irene Schultt
Iwao Yamashita
Dra. María Augusta Moscoso
Lcd. Héctor Jaramillo
Tgl. Mauricio Rivera J.
Subsecretaría Regional de la Sierra
Ing. Angel Vaca Cazorla
Subsecretaría de Fomento Ganadero
Dr. Silvana Acosta
Ing. Lourdes Reinoso G.
Subsecretaría de Fomento Agrícola
Ing. Jessenia Mera C.
Dirección Provincial de Cotopaxi
Ing. Flankling Pilatasig Molina
Dirección Provincial de Tungurahua
Ing. Fabián Valencia
Ing. Rusvel Ríos
Dirección Provincial de Bolívar
Ing. Luis Rivera
Ing. Edyvin Lara
Dirección Provincial de Chimborazo
Ing. Víctor Angueta
- Subsecretario de Planificación, Ministro Encargado
Asesora de Cooperación Internacional
Asesor de Cooperación Internacional JICA
Miembro de Equipo Técnico de Cooperación
Miembro de Equipo Técnico de Cooperación
Miembro de Equipo Técnico de Cooperación
Coordinador de Fomento Agropecuario
Directora de Subsecretaría de Fomento Ganadero
Técnico Tercero Especial
Director de Semilla e Insumos
Director Provincial
Director Provincial
Coordinación
Director Provincial
Técnico
Director Provincial
Asesor Ministro
Asesor Ministro
Técnico Seguimiento y Evaluación
Director de Transferecia
Director Ejecutivo
Director de Desarrollo
Cooperación Externa
Fortalecimiento Organizacional
Director Ejecutivo
Director de Estudios y Estadísticas
Técnica de Estudios y Estadísticas
- 2) INCCA**
Dr. Luis Oña
- 3) INIAP**
Ing. Fausto Merino
- 4) INAR**
Ing. Washington Uquiza B.
Ing. Daniel Toro
Sra. Máltha C. Burgos
Ing. Ximena Rojas
- 5) INDA**
Ab. Ec. Galo Aldaz
- 6) BNF**
Econ. Oscar Terán
Dra. Mónica Ruiz
- 7) Consejo Provincial**

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MINUTES OF MEETING
ON
THE DRAFT FINAL REPORT
FOR
THE STUDY
ON
THE PLAN OF REORGANIZATION OF
THE AGRICULTURE SUPPORTING SERVICES,
COPING WITH POVERTY ALLEVIATION
FOR RURAL PEASANT IN MOUNTAINOUS AREA
IN THE REPUBLIC OF ECUADOR

AGREED UPON BETWEEN
MINISTRY OF AGRICULTURE, LIVESTOCK, AQUACULTURE AND
FISHERIES
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Quito, 21, July, 2010


In accordance with the Scope of Work for the Study on The Plan of Reorganization of the Agriculture supporting Services, coping with Poverty Alleviation for Rural Small Scale Farmers in the Mountainous Area in the Republic of Ecuador (hereinafter referred to as "the Study") signed by the Ministry of Agriculture, Livestock, Aquaculture and Fishers of the Republic of Ecuador (hereinafter referred to as "MAGAP") and the JICA Preparatory Study Team on 12 November, 2008, the Study in Ecuador has been commenced on February 2009 and will be finalized on July 2010.


The JICA Study Team headed by Mr. Takashi FUJITA submitted and explained the Draft Final Report on the meeting for the Conductor Committee held on 21 July, 2010, to the MAGAP headed by Eco. Juan Carlos Parra, Secretary of Planning and to the officials members involved to the present Study, at the same time exchange of opinions was made between the Ecuadorian side and the Study Team.

As the result of the said explanation and an exchange of opinions, the Ecuadorian side and the Study Team have agreed the following:

1. The MAGAP received from the Study Team Fifty Five (55) copies of the Draft Final Report in Spanish.
2. The Ecuadorian side and the Study Team agreed on contents of the Draft Final Report.
3. Both sides agreed that the opinions and comments on the Draft Final Report will be delivered by each of the participating institutions to International Cooperation of the MAGAP until 02 August, which in turn will deliver them to the study team until 09 August.
4. The MAGAP has expressed its intention to establish a preparation team inside the headquarter of the MAGAP, which in turn will activate the pilot project for carrying out the round table meetings and forums in the province of Chimborazo.
5. The MAGAP has requested the "Support for the Implementation of the Pilot Project on Realization of Round Table Meetings and Forums supporting the Territorial Arrangement Plan" to JICA.
6. The study team promised to convey this request to JICA in Japan.

This Minutes of Meeting is prepared in English and Spanish. In case that any discrepancy may arise between these two versions, the English version shall prevail over the Spanish language version.


Eco. Juan Carlos Parra
Secretary of Planning
Ministry of Agriculture, Livestock,
Aquaculture and Fishers


Ing. Takashi FUJITA
Jefe del Equipo
JICA Study Team



List of Participants for the Conductor Committee

1. Ecuadorean Side
 - 1) MAGAP
 - Planning Secretariat
Econ. Paul Perea
 - International Cooperation
 - Ing. Irene Schuidt
Iwao Yamashita
Dra. María Augusta Moscoso
Lcdo. Héctor Jaramillo
Tgl. Mauricio Rivera J.
 - Secretariat for Institutional Reform
 - Ing. Eduardo Zalamea
Ing. Alexandra Ortega
 - Secretariat of Agricultural Development
 - Ing. Felipe Sotomayor
 - Livestock Development Secretariat
 - Ing. Diana Llor
 - Chimborazo Provincial Direction / Secretariat Regional of Zone 3
 - Ing. Victor Anguiera
 - Tungurahua Provincial Direction
 - Ing. Josué Salazar
Ing. Holger Vivanco
 - Cotopaxi Provincial Direction
 - Ing. Hernán López-Araujo
 - 2) INCCA
 - Ing. Mauricio Proaño
 - 3) INIAP
 - Ing. Fausto Merino
 - 4) BNF
 - Ing. Mónica Ruiz
 - 5) SENPLADES
 - Carlos Cando Arias
José Jurado
 - 6) Cotopaxi Provincial Council
 - José Antonio Llumtiasig
 - 7) Chimborazo Provincial Council
 - Ing. Fernando Freire
 - 8) Bolívar Provincial Council
 - Ing. Mauricio López
-
2. Japanese Side
 - 1) Japan International Cooperation Agency (JICA)
 - Kiyoshi Hirozumi
Deputy Resident Representative
 - JICA Study Team
 - Takashi Fujita
Kazuo Nagai
Motohiro Yasuhisa
Carlos Wakabayashi
Sachi Nozagari
 - Team Leader
Team Member
Team Member
Interpreter
Interpreter