### (3) Eligible areas

The following areas were selected since they are representative of the target crops and represent the zone of highest production for each product:

**Coffee Production Area**

The community of Mixcum, in the municipality of Cacahoatán, is located to the north of Tapachula between 500 and 650 meters above sea level, with an approximate surface of 400ha. Most of the producers are ejido growers who belong to a producer' association.

**Corn Production Area**

The community of Santa Cruz, in the municipality of Frontera Hidalgo, is located to the east of Tapachula toward the border with Guatemala, near the Suchiate River, with an approximate surface of 500ha. Most of the producers are ejido growers and small-scale private farmers who carry out activities within producers' organizations.

## *7.3 Consideration of the Crops to be introduced for Agricultural Diversification*

### (1) Crops

In order to introduce new crops and promote the diversification in the areas of Santa Cruz and Ejido Mixcum, the following factors were taken into consideration:

- To have adaptability to the climatic conditions
- Have a relative ease to be placed in the market by the producers
- Generate good profits even in limited surfaces
- That they can be intercalated with corn and coffee
- Harvest time should not be concentrated in a particular season and labor can be distributed
- Produce constant income
- With few problems of pests and disease
- Take advantage of the meteorological conditions of the region and with a vision towards the North American market through NAFTA
- No need of large investments for the construction of infrastructure
- That it is in accordance with the commercialization forecast

### (2) Species to be Introduced for Mixed Agriculture with Cattle Raising

Swine breeding and fattening in the region will be promoted. It should be pointed out that the ideal would be to bring the breeding stock from outside so as to accelerate the process and increase the number of animals, progressively. After having done the fattening for several years, and acquiring more experience, and if there is an increase on the farmers' interest in the future one could think of introducing different methods for the introduction of breeding piglets and swine for reproduction.

## 7.4 *Subproject: Improvement of Agricultural and Livestock Production of Low Income Farmers in Santa Cruz, Municipality of Frontera Hidalgo*

### (1) Diagnosis of the Objective Area

**Geographical location and administrative division**

- The subproject area (Cantón Santa Cruz) is situated in the Frontera Hidalgo municipality. The municipality is located at the 14° 46′ North Latitude, and the 92° 13′ West Longitude, and is one of the municipalities of the Soconusco Region, adjoining to the border with Republic of Guatemala along to the Suchiate River.

**Climatic condition and natural resources**

- Annual mean rainfall is 1,903 mm and more than 90% of it is concentrated in the rainy season which is between May and October. On the other hand, monthly mean temperature changes only slightly between 26.8°C y 28.8°C with an annual average of 27.4°C.

**Land use**

- Present land use in the subproject area is as follows: corn (61%), pasture (24%) and fruits (9%) and others (6%).

**Land tenure**

- The total surface of the subproject area adds up to 503.3ha and each farmer owns a parcel, which varies between 1.25 ha and 24 ha with an average of 9.7 ha. The number of landowners in the area is 52.

**Social aspects**

- The area of subproject belongs to Cantón Santa Cruz. The majority of the landowners reside in the municipal header, leaving a very scarce population inside of the area formed by agricultural laborers without land that are being employed by small property owners.

- There is a total of 29 landowners, i.e. 41.4% of the total landowners in the subproject area, and they are affiliated to the SPR Frontera Hidalgo (Frontera Hidalgo Rural Production Society), and the area of the lots include 47% (246.5 ha) of the total area of farmland. There are 44 unorganized producers with 321.25 ha of the farmland in the area. There is no women's group among the producers in the area.

**Agricultural production**

- In the area of the subproject there are 52 farm households, with an average cultivation area of 9.7 ha, 31 farm households are involved in corn monocultivation and its average cultivation area is 7 ha.

- The average yield for corn is 2.7 ton/ha, which is superior to 1.9 ton/ha of Soconusco region with 1.9 ton/ha. The yield for sesame, sorghum and mango is also higher than the one from Soconusco region.

**Livestock**

- There are 537.3ha of farming land in the area, from which 129 ha (24.0%) are pasturelands. From a total of 52 production units, 12 have pasture and the one with the largest amount of surface has 24 ha, the smallest being of 3ha, with a total average of 12.4ha. The owner of the 24 ha of pastureland apparently is dedicated exclusively to cattle raising, but actually he is an intermediary, one who is commonly called a '*Coyote*'. He is dedicated to purchase calves of about 1 to 2 years old, raising them for a period of about 6 to 12 months and finally selling them to larger cattlemen from other states. The most prevailing breed is Central American Creole variety or crossbreeds with Holstein or Frisian, noticing a difference with the local varieties that are crossbred with Cebu.

- Around the region, various swine corrals can be observed sponsored by the project for fattening swine from Alianza para el Campo, but within this subproject there is none. Some producers fatten up swine formally from crossbreeds between fine and common.

**Marketing system and commercialization**

Corn has been planted traditionally in the subproject area. Before, the farmers sold their crop to CONASUPO, which was still doing purchases in Soconusco and in a small proportion with intermediaries. This ended on March of 1999, now the producers require finding an alternative way of selling their product other than to CONASUPO.

Besides corn, sesame is being planted with the residual humidity left after the corn plantation. Almost the total production is sold to intermediaries who purchase them to resale them in Guatemala, Puebla, Oaxaca and Guanajuato.

**System of rural financing**

From the results of the interviews to the farmers of the area carried out by the Study Team, less than 30% of the farmers in the area of the subproject had access to agricultural loan the last year.

The modality of credit that the farmers of the region depend on are the credits exclusively for short term cropping loan called "avío", which was utilized for planting corn; so there was no farmer benefited by the long term credit called "refaccionario" which is for capital goods.

The great majority of the farmers in the area are engaged in cultivation of corn, so they are financially supported by SAGAR and PROCAMPO. In addition, local farmers had received a relevant subsidy under the program Alianza para el Campo for the purchase of seeds for corn and beans.

**Rural and agricultural infrastructure**

The only irrigation facilities in the Area are shallow wells in two farms. Some farm owners believe that the Area has a great potential of available groundwater considering the existing conditions of springs and shallow wells in the Area.

The objective area is located along the Highway No.19, approximately 27 km from Tapachula City, which leads from North to South direction up to the border of Guatemala. From the Highway, there are 4 local access roads to the Area. The inner roads are coated by gravel in fair condition with a width of 3 to 4 m connecting the farms with the internal network of roads; these inner roads are still gravel in good condition except for the short sections that require

maintenance but vehicles can still pass during rainy season.

Water supply facilities are not established in the Area. The residents of the region draw water for domestic use from these shallow wells (about 10m depth) installed in each house using a bucket to draw water from them. None of these wells ever dry up, even during dry season. It is worth indicating that the majority of the owners live in the municipal header in houses that have all the basic necessary services.

In the area, there is no sewerage facility.

### (2) Proposed Development Plan

This subproject has the following development plans.

#### 1) Plan for the introduction of mixed agriculture with swine breeding

**Plan profile**

- Diversify the agricultural and livestock exploitation with the introduction of tropical flower or pineapple.

**Target farm households**

- Of 32 farm households engaged in corn mono cultivation in the Study Area, 25 farm households, which farm size is less than 10 ha (4.25 ha in average farm size) will be target farm households.

**Proposal to improve corn productivity**

- The object is to increase in the maize yield, which averages 2.7 ton/ha (actual yield) to 6 ton/ha goal for the subproject)
- The improvement of yield will be done with the increase of inputs such as fertilizer and agrochemicals, as well as planting improved seeds.
- Moreover, yellow corn, which has rich in nutrient value, will be introduced as feed to introduce diversified farming system with hog raising into the farming system with maize mono cultivation.
- It will be stopped to bend cull at physiological maturity to dry seeds in the field, which is one of the traditional cultivation methods of corn in the area. As an alternative method, cut crops frequently to make the best use out of the warehouse and dryer.

**Introduction of the diversified farming system with ornament plant and maize**

- The group of producers will organize themselves to introduce Hawaiana (Alpinia purpurata) one of the ornamental plants, with the monocultivation of corn for the diversified farming system. The group of farmers will collect and pack jointly the production, so they can negotiate in an advantageous manner and prevent intermediaries. Also, corn production will improve by taking advantage of the organized activities carrying out the joint purchase of agricultural material at low prices and joint work.

**Introduction of the diversified farming system of pineapples and corn**

- Farmers group will be organized to introduce pineapple into the maize monocultivation practice for diversified farming system. Also farmers group will collect and ship their agricultural products to turn to the farmer's advantage at the negotiation without brokers. Furthermore, corn production will be improved by their group activities such as joint buying of agricultural materials at low price and joint working. Each farmer will plant one hectare of pineapple, i.e. 25 hectares of pineapples will be introduced into the Study Area.

**Introduction of swine breeding for mixed development**

- The target is to organize 25 existing corn growers as the beneficiaries, including women groups and a pigpen will be installed per family or household. As for feed they could have mainly yellow corn, sorghum and white corn not used for human consumption, banana waste, pineapple, crushed cacao and chopped pasture grasses mixed with kitchen leftovers. Feed will be given three times a day with water to be consumed freely.

**2) Plan to strengthen technical assistance and extension services**

The improvement of each small-scale farmer's agricultural technique is indispensable to promote diversified farming by introducing the tropical ornament plant, the small and medium size cattle, in addition to the improvement of corn production. For this purpose it is necessary to accompany it with the necessary techniques of production and a system that would make possible to obtain this techniques from the producers. In this sense, it will be proposed to assign agricultural engineers in the municipality for the following activities:

- Communicate to all the producers that the technical assistance will only be limited for the producers who wish to increase their productivity.

- Orient the interested producers towards organizing to be able to carry out an efficient technology transfer.

- Register the organized producers with the municipality of Frontera Hidalgo and make arrangements for technical assistance for these organizations.

**3) Plan to improve agricultural and livestock commercialization system and agroindustrial promotion**

With the disappearance of CONASUPO, the corn growers should organize into associations so they can start dealing with the buyers to define such conditions as the requirement of product quality, method of crop delivery, sale price, payment method, etc.

The wood from Primavera trees is used basically for furniture and the national market for it has not been exploited. Since it starts producing after 9 pr 10 years, it would be necessary to look for buyers in the furniture industry of the country and celebrate purchasing agreements according to their specific needs.

When the first 5ha of the initial stage starts producing on the second year of the project, the model region will produce a limited quantity of hawaiana, being sent all to the national market. The planted surface of hawaiana will be expanded gradually until having 20 ha in total and once this surface starts producing, 15 ha will go to the national market and 5 to the international.

In the same lot where hawaiana is proposed for production, pineapple will be planted, too. The selected producers for planting flowers will also dedicate themselves to pineapple. The commercialization committee will be in charge of block sales from each farmer. This way, each one of them will deliver their harvest to a collection center so their product is sent to Tapachula.

Swine will be sent to the market through the producers association. When the producers establish a stable system of breeding, the producers themselves will process swine to produce sausages, bacon, chicharon, etc.

**4) Plan to improve agricultural and rural infrastructure**

**Development of irrigation facilities**

- It is planned to install irrigation facilities for the cultivation of the tropical flowers or pineapples, which will be introduced in this Area for the new multiplication program.
- The water for irrigation will be taken from shallow wells taking into account the advantages to save on investment costs and also in operation and maintenance expenses of the constructed installations.
- Irrigation method will be by furrow, which is the most economical, comparing it with drip, sprinkler, etc.
- The installations proposed are wells (25 wells), pumps, channels, drainage exits, etc.
- The operation and maintenance of the irrigation installations will be carried out by the producers.

**Road improvement**

The roads with sections without revetment will be improved in order to facilitate the transportation of agricultural products, animals and agricultural input.

**5) Other Plans**

**Strengthen rural organization**

In order to have stability on field management, the corn producers in the area Frontera Hidalgo have as an objective to form a new organization of producers introducing crop diversification and combined management with the joint collection, distribution and sale of their products. On the other hand, a group will be formed with rural women dedicated to the combined management in order to improve their social level.

**Improve rural financing system**

They will give priority to improve accessibility to the existing or conceived programs (PROCREA from FIRA, Credito con garantía of PROCAMPO, Credito especial for beneficiaries of Alianza para el Campo). A system of micro-credit will be introduced to support the breeding of pigs by the rural women, contemplated in the agricultural and livestock diversification plan and introduction of mixed agriculture with pork breeding.

## 7.5 *Subproject: Improvement of Agricultural and Livestock Production of Low Income Farmers in Mixcum, Municipality of Cacahoatán*

### (1) Diagnosis of target area

**Location, administrative division and population**

- The subproject area is situated in the Cacahoatán municipality. The area is located at the mountainside of the Tacana mountain with the 14° 01′ North Latitude, and the 92° 08′ West Longitude, and is one of the municipalities of the Soconusco Region, adjoining to the border with Republic of Guatemala. Presently, there is an estimated population of 1,496 in this entity grouped in 300 families.

**Climatic condition and natural resources**

- The subproject area is located in one of the zones with the largest amount of rain in the country with an annual mean precipitation up to 3,900 mm. If there is an amount of rainfall in all the months of the year, approximately 85% of the annual rainfall is distributed in six months between May and October. On the other hand, mean monthly temperature is consistent all year round with insignificant variation between maximum (27.6C in April) and the minimum (25.8C in January).

- The predominant soil is Andosol, with a black appearance and abundantly fertile.

**Land tenure**

- Land with coffee plantation represents 90% of the total land use and corn farming occupies a very limited surface.

- The land was awarded to 75 ejidatarios equally with a surface of 5ha. Since then, the number of landowners has tripled and as a consequence, the awarded land has been divided amongst the relatives.

**Social aspects**

- Rural community of the Ejido Mixcum is formed based on the general assembly of the village, which is an authority (decision-making) of village community. The directorate of this community is composed of a commissary (comisariado), secretary (secretario), treasurer (tesorero) and members of the vigilance committee, and those members are elected every three years by the general assembly. The general assembly also assigns members of construction committee (improvement of rural roads and public common facilities), health committee (health control by promoters as a center of the activity) and women's committee (support to DIF activities).

- The ejido farmers in the subproject area are participated to the Ejido Union "Lazaro Cardenas del Rio" and the CIOAC-Regional. Number of members to the Ejido Union is of 76 persons (56 men and 20 women) and the members of the CIOAC-Regional are 60.

**Agriculture and livestock production**

- Coffee plantations are distributed at both sides of Mixcum spring, while corn is planted

exclusively on the left margin.

- The main varieties are basically Typica, Bourbón, Caturra and Robusta. The yield level represented by parchment coffee of Typica variety has an average of 5 Qq/ha, which is lower than the average yield (12 Qq/ha) of Soconusco region.

- The planting is generally done with the beginning of the rains, during the month of May, using seeds reproduced in their own lots, it is then folded in August when it reaches its physiological maturity, drying in the field for 20-30 days and the ears are removed from the plant on the first days of September, removing the kernels in the farmer's backyard. Corn productivity is so low (0.7 ton/ha) one third of what is grown in the plains, due to the lack of necessary inputs.

- The gross profit of coffee, which is the main crop in the Study Area, is only 1,950 Peso/ha. This figure means that the annual income of the typical coffee production farmer in the Study Area is 9,750 Peso.

**Livestock**

- As the mono cultivation of coffee of this sub-project area, there is no pasture and only one producer has Creole cattle crossbred with Brown Swiss.

- There are no swine, sheep or poultry in the backyards of the houses.

**Agricultural and livestock marketing system and agroindustry**

- Coffee fruits of Typica and Bourbón are pulped using equipment called "Despulpadora" either manual or mechanic depending on the amount of grain. Parchment coffee is sold to intermediaries or to Unión de Ejidos Lázaro Cárdenas del Río.

- Corn production is very scarce and its entirety is for self consumption.

**Rural finance system**

- Judging from the farm survey conducted by the Study Team, farmers who were benefited by the rural finance remain as low as 30% of the total farmers, of which only one-third had loan directly from banks and the rest received financing through Unión de Ejidos "Lázaro Cárdenas".

**Agricultural and rural infrastructure**

- This subproject area is predominantly coffee monocultivation and therefore there are no important irrigation facilities

- Inner roads are classified into urban and rural roads and they communicate the residential zone to the coffee production area. The access road to the Area communicates the town of Mixcum and is paved with asphalt having a length of 1.0 km., with a rolling surface width of 6m, in regular condition.

- The water supply facility is maintained by the Ejido. The water source is the Arroyo Mixcum with an intake and a canal where water flows for a distance of about 1.5 km.

This intake supplies water not only to the municipal header of Cacahoatán but also to the irrigation district of Cacahoatán. The inhabitants of Mixcum receive their water supply through a connection with the channel.

- The sewerage system was established by a network of 30 cm concrete pipes along the center of each main street of the community were each household is connected. All the sewerage pipes are connected perpendicular to a main collector located in the lower part of the residential area in the same direction as the Mixcum River. All the houses in the residential area are connected with the pipeline, however all sewerage is drained to the river without any treatment.

### (2) Proposed Development Plans

The present subproject has the following development components:

#### 1) Plan for the introduction of mixed agriculture with swine breeding

**Plan profile**

- The objective of this plan is crop diversification introducing ornamental plants in coffee plantations. First, the program will research how to increase coffee production and later the program will introduce ornamental plants in corn plantation. Also, inside the area, yellow corn production will be examined as livestock feed introducing a diversified farming system.

**Target household**

- The target households are a total of 75 families with 5 ha of land.

**Improving coffee productivity**

- The yield of the Arabic coffee, which has wide market in the world judging from its circulation, will be increased by 20 Qq/ha in 5 years through the fertilizer application and high plant density such as 2,500 – 3,000 trees/ha.

- Robusta coffee, which has been planted because of the few agricultural practices needed at harvest, and is presently being sold to Nestle Co. which is the only market in Mexico, and hence will be replaced with Arabic coffee.

- Renovation of coffee is not carried out all at once, but carried out every other row. The improved variety such as Caturra, Catuai, Catimor etc, which is short and suitable for dense planting, will be introduced at high density. The rest of coffee trees are treated by the Recepa treatment, which is cutting main trunk to introduce branches and to be rejuvenated. This Recepa treatment will be done every 4 years, for 12 years. This renovation will be carried out in one hectare of the coffee field every year. The coffee trees, which are not renovated, will be kept as before getting income at the renovation period.

**Introduction to the diversified farming system with ornament crops**

- Camedor palm, which is a tropical foliage plant, will be introduced into the coffee monocultivation farming as a diversified farming system. Since there is sufficient amount of rainfall and good soil moisture condition in the area and both the coffee and shade trees

can be used as shade trees for Camedor palm. Also the farmers group will be organized to collect and ship their agricultural products, not only Camedor palm but also coffee, and to turn to farmer's advantage at the negotiation without brokers. These processes will lead the farm household on the road to not only the improvement of farm economy but also that of coffee production.

**Introduction to the diversified farming system with useful trees**

- Cedro rojo, which is one of the useful trees, will be introduced to the subproject area, not only as shade trees for coffee but also as the diversified farming system with coffee.

**Introduction to yellow corn as feed**

- About 20 Ejidatario have planted corn for self-consumption in about 10 ha. Yellow maize, as feed for hog raising, will be planted instead of the maize to introduce diversified farming system with the small and medium size cattle.

**Introduction of hog raising for agricultural farmers**

- As the field used for corn production is useful for raising grains for animal feed. It will be possible to introduce swine fattening project in this area as well as in Santa Cruz if the farmers can organize farming by themselves. However, this area is too small to rise grains, the size of pigpens must thus be reduced.

**2) Plan to strengthen agricultural extension services**

The improvement of each small-scale farmer's agricultural technique is indispensable to promote diversified farming by the introducing Camedor palm, the useful tree and the small and medium size cattle, in addition to the improvement of coffee production. Municipality of Cacahoatán will act as intermediate between the farmers at Ejido Mixcum, who want to get new agricultural technique, and the organization on agricultural research and extension services to exchange of their information frequently and to arrange the technical transference effectively to the farmers. Each organization has the following responsibility to execute their role.

**3) Plan to improve commercialization and promote agro-industry**

- Due to the lack of the knowledge for the commercial rout of the Camedor palm, the farmers will organize a cooperation for sale. In the initial stage, the large scale farmer who is shipping to the Central market in the Mexico city will be considered as the buyer. At any rate, it is necessary to make a selling/buying contract between the producers and the trader to ensure the selling price, time to delivery, package method and etc.

- The existing processing facilities owned by the low-income farmers confront structural damage and therefore renovation is pretended. At the same time, installation of processing benefits is contemplated in large scale, and with coffee fruit supplied by coffee growers of the area.

- Swine commercialization will be carried out in Cacahoatán and Union Juarez municipality.

**4) Plan to develop rural infrastructure**

The farm road that stretches from the residential area to the plateau, which is located in the left

side of Rio Mixcum, will be improved for the change of better agricultural activities and also the protection against soil erosion. The sections to be improved are divided into the section from the residential area to Rio Mixcum.

**5) Other plans**

**Strengthen rural organization**

In order to strive for stabilization of farm management of coffee producers, the strengthening and activation of the existing Ejido producers' organization, through group formation of rural women involving multiple farming, the social status of rural women will be improved.

**Plan to improve access to rural financial system**

The improvement proposal to be applied to this subproject area is the same in principle as that is envisaged in the subproject area of Santa Cruz, Frontera Hidalgo. Nevertheless, it is worth while to indicate that PROCAMPO guaranteed credit shall have less impact in this area, because beneficiaries of PROCAMPO in the area are limited to 30% of total and the benefited area is as small as 0.9 ha per beneficiary. Under the circumstances, an emphasis should be placed on promotion of access to FIRA's PROCREA due to the fact that this program's target beneficiaries at its initial stage are coffee farmers.

## *7.6 Implementation Plan for the Activities and Cost Estimation*

### 7.6.1 Methodology for Implementation of the Activities

At the beginning the project will be implemented based on the investment of own resources from the producers. Nevertheless, to be able to carry out an increase in the production of present crops and to be able to introduce new ones, public dependencies will have to award support to the producers so they can obtain agricultural credits.

### 7.6.2 Progress of the Implementation of Activities

At the beginning of the activities the organization of the producers will be carried out, but regarding this, it will be done with the help and cooperation of the federal, state and municipal governments. Parallel to the organization, all the necessary process required to prepare the loans in an early manner will be carried out.

In the next page, a program for the project implementation for the improvement of agricultural and livestock of low income farmers is shown.

WORK SCHEDULE OF PLAN FOR IMPROVEMENT OF AGRICULTURAL AND LIVESTOCK OF LOW INCOME FARMERS FOR CORN AND COFFEE PRODUCTION AREA

| | ITEM | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | **Maize Production Area** | | | | | | | | | | | | | | | | | | | | | |
| 1 | Preparation | | | | | | | | | | | | | | | | | | | | | |
| 2 | Production of Maize | | | | | | | | | | | | | | | | | | | | | |
| 3 | Diversified Farming System | | | | | | | | | | | | | | | | | | | | | |
| | (1) Production of Maize and Ornament Plant | | | | | | | | | | | | | | | | | | | | | |
| | (2) Production of Maize and Pineapple | | | | | | | | | | | | | | | | | | | | | |
| 4 | Production of Yellow Corn for Feed | | | | | | | | | | | | | | | | | | | | | |
| 5 | Production of Pig | | | | | | | | | | | | | | | | | | | | | |
| 6 | Construction of Facilities | | | | | | | | | | | | | | | | | | | | | |
| | (1) Irrigation Facilities for Ornament Plant | | | | | | | | | | | | | | | | | | | | | |
| | (2) Irrigation Facilities for Ornament Plant | | | | | | | | | | | | | | | | | | | | | |
| | (3) Collection & Delivery Center for Pineapple | | | | | | | | | | | | | | | | | | | | | |
| | (4)Collection & Delivery Center for Ornament Plant | | | | | | | | | | | | | | | | | | | | | |
| | (5)Construction of Pig Pen | | | | | | | | | | | | | | | | | | | | | |
| | (6) Improvement of Road | | | | | | | | | | | | | | | | | | | | | |
| 7 | Organizing of Farmers Association | | | | | | | | | | | | | | | | | | | | | |
| 8 | Arrangement of Rural Credit | | | | | | | | | | | | | | | | | | | | | |
| II | **Coffee Production Area** | | | | | | | | | | | | | | | | | | | | | |
| 1 | Preparation | | | | | | | | | | | | | | | | | | | | | |
| 2 | Production of Coffee | | | | | | | | | | | | | | | | | | | | | |
| 3 | Production of Coffee and Ornament Plant | | | | | | | | | | | | | | | | | | | | | |
| 4 | Production of Coffee and Useful Trees | | | | | | | | | | | | | | | | | | | | | |
| 5 | Production of Coffee and Yellow Corn | | | | | | | | | | | | | | | | | | | | | |
| 6 | Production Pig | | | | | | | | | | | | | | | | | | | | | |
| 7 | Construction of Facilities | | | | | | | | | | | | | | | | | | | | | |
| | (1) Coffee Processing Equipment (Individual) | | | | | | | | | | | | | | | | | | | | | |
| | (2) Coffee Processing Equipment (Centralized) | | | | | | | | | | | | | | | | | | | | | |
| | (3) Collection & Delivery Center for Coffee | | | | | | | | | | | | | | | | | | | | | |
| | (4)Collection & Delivery Center for Ornament Plant | | | | | | | | | | | | | | | | | | | | | |
| | (5) Construction of Pig Pen | | | | | | | | | | | | | | | | | | | | | |
| | (6) Road Improvement | | | | | | | | | | | | | | | | | | | | | |
| 8 | Organizing of Farmers Association | | | | | | | | | | | | | | | | | | | | | |

Note: Production increasing period
Ordinary production period/implementation period

### 7.6.3 Estimate of Investment Cost

The investment required for the execution of the subproject is estimated as follows:

Subproject: Improvement of agricultural and livestock of low income farmers in Santa Cruz

| | |
|---|---|
| Introduction of hawaiana | $ 3,934,000 |
| Introduction of pineapple | $ 3,919,000 |

Subproject: Improvement of agricultural and livestock of low income farmers in Mixcum

$ 6,060,000

## *7.7 Evaluation of the Project*

### 7.7.1 Economic and Financial Evaluation

#### (1) Subproject: Improvement of Agricultural and Livestock Production of Low Income Farmers in Santa Cruz (Corn producing area)

The agricultural and livestock development of a model unit of production both in the present situation as well as with the project will be done as follows:

| Present Situation | With the Project |
|---|---|
| Corn production: 4.25 ha<br>Sesame production: 0.5 ha | (Alternative A: Combination of maize with Hawaiana)<br>Maize production (Including yellow corn): 4.05 – 3.45 ha<br>Hawaiana + shading tree (Banana, Cedro rojo): 0.2 ha – 0.8 ha<br>Rearing of swine: 13 heads (Annual)<br>(Alternative B: Combination of maize with pineapple)<br>Maize production (Including yellow corn): 3.25 ha<br>Pineapple: 1 ha<br>Raising swine: 13 heads (Annually) |

If profitability were calculated in both cases, with and without the support from Alianza para el Campo on both alternatives, it would be as follows:

Profitability based on financial price

| Alternatives | Support from the Alianza para el Campo | NPV (At discount rate of 9%) | IRR (%) |
|---|---|---|---|
| A: Combination of maize with Hawaiana | Yes | $ 8,145,191 | 23.9 |
| | No | $ 6,852,266 | 19.3 |
| B: Combination of maize with pineapple | Yes | $ 8,916,357 | 32.6 |
| | No | $ 7,623,431 | 25.3 |

Profitability based on economic prices

| Alternatives | Support from the Alianza para el Campo | NPV (At discount rate of 9%) | IRR (%) |
|---|---|---|---|
| A: Combination of maize with Hawaiana | Yes | $ 6,611,930 | 29.9 |
| | No | Ditto | |
| B: Combination of maize with pineapple | Yes | $ 11,849,621 | 77.3 |
| | No | Ditto | |

Of the two alternatives, it is concluded that Alternative B (Combination of maize with pineapple) produces higher returns than the Alternative A (Combination of maize with Hawaiana).

#### (2) Subproject: Improvement of Agricultural and Livestock Production of Low Income Farmers in Mixcum (Coffee Production Area)

Farm production per model farm for both the present situation and with the project will be as follows:

| Without Project | With Project |
|---|---|
| Coffee + shading tree (banana): 5 ha<br>Maize production: 0.5 ha (20 farmers) | Renovation of coffee trees: 5 ha (1 ha/year x 5 years)<br>Camedor palm: To be intercropped with coffee as shading tree + shading tree<br>Maize (Yellow): 0.5 ha (20 farmers)<br>Rearing of swine: 6 heads (Annual) |

The profitability of the present project was examined in both cases with and without the support of Alianza para el Campo and is shown as follows:

| Support from the Alianza para el Campo | Return on the basis of financial prices | | Return on the basis of financial prices | |
|---|---|---|---|---|
| | NPV (At discount rate of 9%) | IRR (%) | NPV (At discount rate of 13%) | IRR (%) |
| Yes | $ 7,985,932 | 19.5 | $ 7,199,054 | 24.6 |
| No | $ 4,897,785 | 14.2 | Ditto | |

### 7.7.2 Socioeconomic Synergy Impact

Besides direct economic benefits (increase in farm income among beneficiaries), the implementation of the subprojects is expected to bring about the following socioeconomic synergetic benefits.

- Increase employment opportunity
- Ease women's participation in productive activities
- Generate profit
- Upgrade the position of Soconusco region as the leading coffee production area
- Enable the treatment wastewater from coffee processing with the introduction of a collective treatment.

On the other hand, it should be mentioned that the implementation of these two subprojects do not require large public investments and therefore the impact of the programs from the state government would be minimized and there would not be a motive to delay social development underlined by the administration of the federal government. Additionally, these subprojects do not contain large-scaled civil works; the negative impact of their implementation over surrounding ecosystem will be alleviated as far as possible.

### 7.7.3 Comprehensive Evaluation

The execution of both projects provides the farmers who have very low and unstable productions due to monocultivation, to liberate themselves from this unfavorable condition giving them a chance to obtain capital, promising them a more affluent and pleasant life in the rural environment.

Both projects have been forged in compliance with the policies of the Mexican government, which, among others, underline alleviation of intervention from the public sector into the agricultural sector, strengthening of the marketing competitiveness and have shown a signpost to which the agricultural sector in the Soconusco region, which is confronted by stagnation without taking measures for optimization of the abundant and valuable natural resources, should be directed.

Therefore, it is anticipated that the subprojects should play a role of catalyst which brings the agricultural sector of the region to revitalization of the past its robust performance and to an accomplishment of sustainable and coherent development in the future.

## 8. PLAN FOR THE PROMOTION OF ECOLOGICAL AGRICULTURE

### *8.1 Outline for the Plan*

**Objective**

The Plan pretends to implement several actions to activate the region's economy, promoting environmental conservation, through the introduction of adequate measures in order to solve the problem of poverty. In this plan the intention is to improve the economy through the introduction of alternative agricultural practices adequate for each topographic condition.

**Strategies for the Improvement**

This plan will take adequate measures for each farming practice, analyzing the degree of land erosion, adequate crop and the possibilities of introducing alternative farming practices. The strategies to be used are the following:

- For the cultivated land that are judged adequate for farming, the yield will be increased and the agricultural economy will be improved through the application of measures against soil degradation such as works preventing erosion, adequate farming practices, introduction of sustainable agricultural systems and the incentive to use organic matter.

- In order to increase crop yield in the adequate cropland, sustainable agricultural practices will be recommended in order to make possible a continuous development.

- Farming practices and erosion control work will be applied widely, through the extension of technology and installation of model farm, demonstrating the importance of the works for the rural farmer.

- In the low potentiality area, the introduction of alternative farming practice will be planned, in order to improve the rural economy.

- In land with possibility of introducing alternative farming, alternative traditional practices (e.g. intensive farming) or agricultural practices related to the utilization of natural resources will be considered for the improvement of the living standard in rural areas.

- An agroecological Center will be installed in order to promote the resources of the region, utilizing the resources adequately and providing environmental education to the residents of the region.

- In the land with steep slope, reforestation activities will be promoted so that jointly the y can strengthen environmental conservation.

- In the present coffee plantations environmentally friendly coffee will be promoted making it possible to obtain a higher value added.

- In order to implement this plan, environmental monitoring will be included.

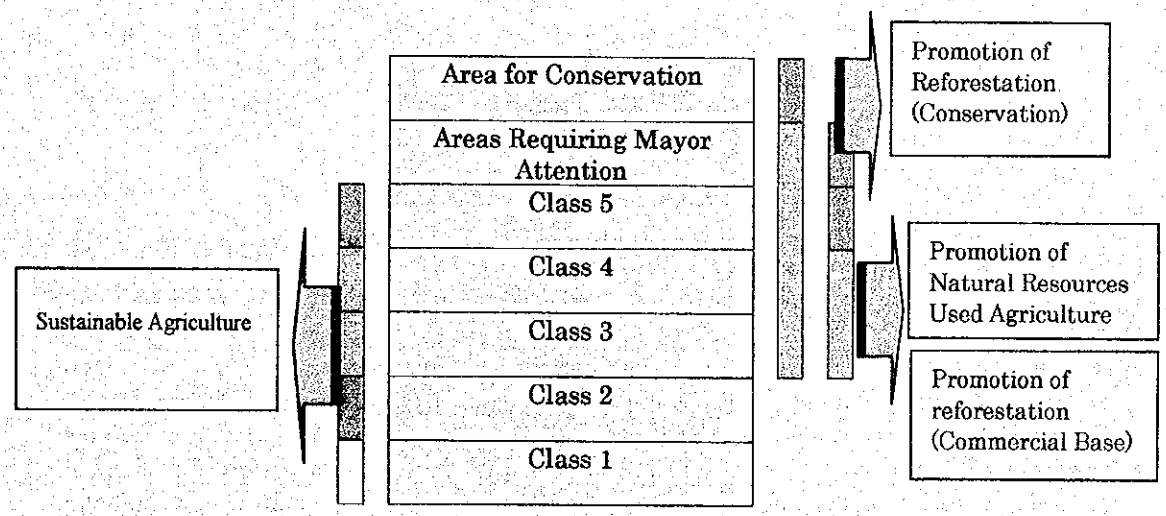
For the execution of this Plan, the necessary actions will be implemented for the classification of adequate crops and land erosion factor. The objective land will be determined in the coffee, cacao, annual and pasture crops

**Classification**

Considering the basic concepts to formulate the plan based on "Suitable Land for Suitable Crop", the region will be classified into three categories:

Suitable land for agriculture (Classified as Suitable land)
Land requiring mayor attention for land conservation (Land slope 12 to 35 degrees)
Land for Conservation (Land with slope of more than 35 degrees)

Strategies to be applied for each category of land:



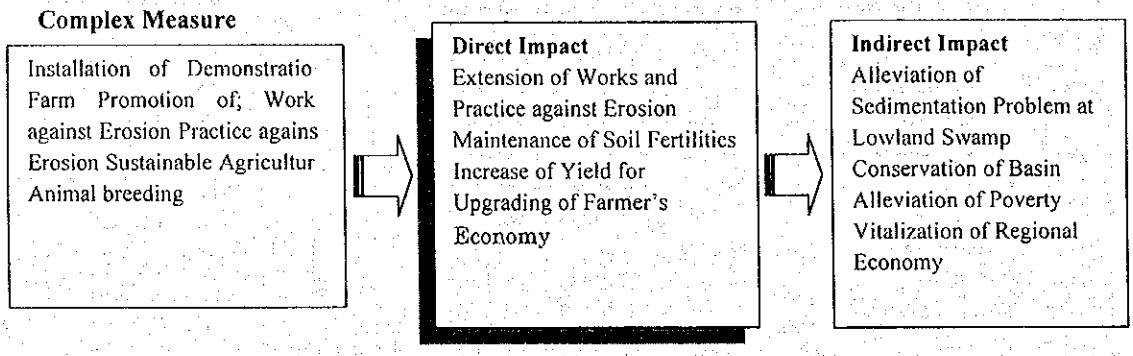

| The plan | Objective Areas |
|---|---|
| Promotion of Sustainable Agriculture | Land adequate for the agricultural activities<br>Land required the continuities of the Activities, otherwise classified as no Adequate |
| Promotion of Alternative Farming, using potentiality of Natural Resources | Land with difficulty to continue the agricultural production |
| Promotion of Forest Resources | Land for Agriculture in a low Adequability<br>Land declassified as Agricultural Land<br>Area require the Mayor Attention of Conservation<br>Area for conservation |

### *8.2 Promotion of Sustainable Agriculture*

This strategy will be implemented mainly in the land classified as adequate for agricultural use and part of the ones not classified for agricultural use where specific measures are required to improve the degradation of soil fertility with the objective of introducing a stable and sustainable agriculture.

As the measures to improve soil fertility, works and practices against erosion will be implemented, adequate for each type of crop, besides the introduction of sustainable agriculture. In order to achieve the best results in the expansion of the measures, demonstration fields will be established to demonstrate the methodology and the agricultural practices adequate for erosion control.

Besides these measures, livestock breeding will be promoted in order to produce organic matter, together with the improvement of the farmers' economy. Materials such as manure and not commercialized products will be used to create organic matter.




### 8.2.1 Erosion Control Works (Terrace and others)

**Alternatives**

. The works will be implemented in areas of moderate risk of erosion within the areas classified as agricultural land. The alternatives of the erosion works are: terrace, reception canal, derivation canal and lawned canal. These works will be implemented, considering the topography of each lot to prevent erosion. A credit line is planned to being established to promote the necessary works.

**Area for the Plan Implementation**

. The objective areas for this plan are the annual crop land with slopes of 3 to 12 degrees and the coffee plantation with slope of 6 to 12 degrees, at higher than 400m altitude. The plan will be implemented where there is high risk of erosion.
. The objective land for the plan to be implemented is 28,600 ha in total (21,000 ha for annual crops, 6,500 ha for coffee plantations and 970ha for cacao trees).

**Implementation Method**

. Agricultural credits will be implemented.

### 8.2.2 Alternatives for Farming Practices against Erosion

**Alternatives for Each Crop**

. Considering that the majority of coffee plantations are located in the steep land, the use of farming practices against erosion are very important. The following practices will be promoted:

1. Contour line Farming
2. Introduction of Shading Tree
3. Pasture cutting
4. Establishment of Vegetation Fence

. The land where annual crops are planted are very susceptible to erosion, more so than coffee plantations, needing more attention. In this Plan existing practices in the region will be promoted. The alternatives are the following:
   1. Rotation
   2. Use of Residual Product
   3. Contour Plantation Practice
   4. Minimum tillage
   5. Introduction of Cover Crop
   6. Establishment of Vegetable Fence
   7. Citrus Cultivation

**Land for implementation of alternative agricultural practices**

. The areas to be implemented with this Plan are the areas with annual crops, coffee and cacao.
. The surface of farming lands for the implementation for this plan is 47,000 ha in total (21,000 ha for annual crops, 24,100 for coffee and 1,900 for cacao plantations).

**Method of Implementation**

. They will be implemented with a low interest credit line.

### 8.2.3 Introduction of Sustainable Agriculture

**Alternatives for the introduction of sustainable agriculture**

. The basic concept of introducing sustainable agriculture is to improve the fertility of degraded soils in order to improve its productivity through the introduction of the following practices:
   1. Introduction of Leguminous plants
   2. Green fertilizer
   3. Use of organic matter

. In order to introduce leguminous plants, known practices will be done to convert it into a fertile soil. The promotion of crops for green fertilizer consists of a rotation practice with corn and leguminous. The leguminous plants will be used as organic fertilizer to incorporate nutrients in the soil. The promotion of organic matter consists on each farm doing the organic matter mixture so it can be incorporated to the soil.

**Land for implementation of sustainable agriculture**

. The objective area is the land with annual crops in soils with high potential. The total surface is 111,900 ha.

**Method of Implementation**

. Farming credits will be provided in the purchase of machinery and seeds.

### 8.2.4 Demonstration Fields

**Objectives**

. In order to have a sustainable agricultural development, it is necessary to cut costs of production and to increase crop yield with the introduction of sustainable agronomic practices and agronomic practices against erosion. Some farmers of Soconusco region are already doing such practices, but the demonstration fields are required to disseminate the information in the entire region.

**Content**

. The surfaces adequate for these demonstration fields are the ones that will ease the implementation of the required practices. Even though the main products of the Region are coffee and corn, only corn will be applied to the demonstration field since this crop is more sensitive to erosion than coffee.

. The practices used in the demonstration fields are the following:
   1. Install the receptor canal with the outlets protected with vegetation.
   2. Install the Vegetation Fence besides the receptor canal.
   3. As for the farming practice against erosion, utilize minimum tillage.
   4. With adequate space, install vegetation fence.
   5. Plant trees at the edge of the land.

**Implementation Method**

. Because of its public interest character, civil works to be implemented in the demonstration fields will be done with public expense. Sustainable agricultural practices will be done using herbicide, implements for weeding and implements, and therefore requiring government support to attain them. The demonstration field will be provided by the local farmer who will be in charge of the operation and management of the field, having to receive the people interested in looking at them.

### 8.2.5 Promotion of Animal Breeding for the Production of Organic Matter

**Alternatives**

. The incorporation of organic matter is an important factor to maintain soil fertility. In this plan the production of organic matter will be promoted with the following actions:
   1. Promotion of small animal breeding
   2. Promotion of Organic Matter Production, using product residues.

. In order to promote small species of animal breeding to make possible the production of organic matter, the costs of swine acquisition and construction of stables necessary during the first stage of this program will be financed as initial investment.

**Area for the Application of the Plan**

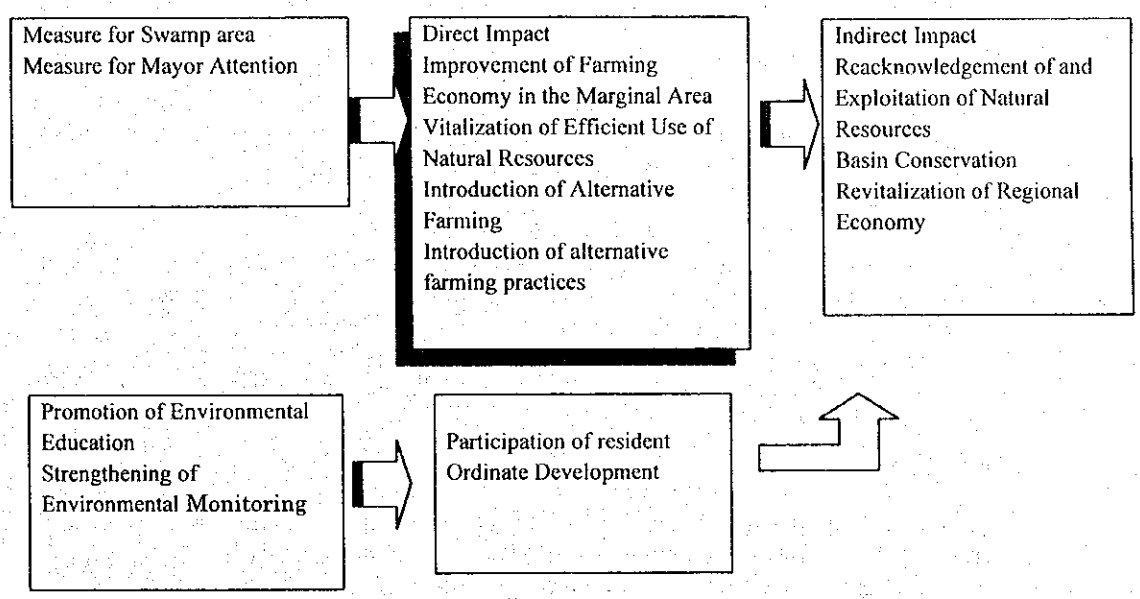
. The areas needed for the implementation of this plan are the appropriate ones for corn and coffee crops, with emphasis on soils for coffee and adequate for corn. The areas are calculated in 215,000 ha.

Implementation Method

. Loans will be granted to the farmers who wish to introduce the necessary installations in order to produce organic matter.

### *8.3 Promotion of Agricultural Practices Using Natural Resources.*

This plan intends to prevent the farming practice that is being carried out presently by a better use of natural resources of the area. The proposed areas will be the swamps and the zones not appropriate for cropping with an altitude higher than 800 m above sea level.




#### 8.3.1 Swamp Area (Use of Fishery Resources)

**Alternatives**

. The following actions will be carried out in order to achieve an orderly development
  1. Improvement of living standard by increasing fishery resources
  2. Introduction of alternative practices for the improvement of living standards of the inhabitants of the region.
  3. Improving the rural economy, using the existing resources.

**Objective Areas**

. The objective communities are within the absorption area of the Biosphere Conservation Area of La Encrucijada.

**Implementation Method**

. Due to its environmental conservation character, the proposed installations will be carried out under the program of cuasi-governmental, the government will be responsible for the

construction of the installations and the producers will be in charge of the administration.

### 8.3.2 Areas requiring higher Attention (Introduction of Intensive3 Agriculture Utilizing Irrigation System)

**Plan Description**

. In order to improve farming activity in these areas, it is necessary to change towards an intensive agriculture concentrated using the favorable natural resources. In this area, some intensive crops will be introduced in small scale, with the help of irrigation.

**Alternatives**

. The alternatives are the following:

1. Use of small-scale irrigation for vegetable crops;
   The substitution plan tries to form the construction base for vegetable crops, through small scale irrigation using the existing springs. Because continuous agricultural practices are difficult, vegetable crop has been recommended.

2. Ornamental plants in small scale crops;
   The Plan consists of the use of a large amount of plants and foliages of great value to promote the areas activation. This Plan promotes the following activities with the purpose of promoting growing plants for foliage in this area.
   Construction of Installations for growing ornamental plants
   Technical assistance for growing ornamental plants.

**Objective areas**

. Objective areas are found where there is difficulty of keeping present activities, nevertheless, there is a need for basin conservation from the point of view of conservation. The objective areas are a total of 45,300ha and (27,600ha for coffee plantations and 17,700 ha for grains).

### 8.3.3 Efficient use of Natural Resources through Environmental Education

**Plan Description**

. In order to promote an efficient use, it is necessary to involve the residents, besides having sufficient and appropriate information for environmental conservation and of an adequate exploitation of the natural resources. To provide this knowledge on natural resources to the residents of the area, the following is required:
   1. Environmental education
   2. Establishment of an ecological center

**Alternatives**

. The ecological center is established to divulge the information on environment and richness of natural resources, also it will provide space for environmental education activities. The objectives of the center are:
   1. Technological diffusion for sustainable agriculture
   2. Development center for natural resources in Soconusco region.
   3. Provision of space for environmental education activities.

. Also, the conservation of floral resources will be done based on the development of the natural resources. The following is planned to be installed:
    1. Sustainable Agriculture (coffee and corn) with demonstration fields of 5ha each.
    2. Botanical garden for floral conservation (1ha) and greenhouses
    3. Fields with Irrigation system (to demonstrate farming with irrigation)
    4. Installations for Environmental Education, Cold Storage for Flower conservation, Dorms, Recreation area.

**Implementation Method**

. It will be carried out with public funds. The expense for the center's operation will be covered by the user's contribution and the center will be operated with own funds.

### 8.3.4 Environmental Conservation through Environmental Monitoring

**Plan Description**

. Even though this area is rich in natural resources, if the adequate measures are not taken, the risk of wasting the natural resources is high. Besides implementing the plans with the measures against environmental degradation, the execution of environmental monitoring is also an indispensable factor.

. Amongst the most important resources in the region, there are resources related to flowers, water resources and soil resources. But due to the problems, in order to develop the natural resources there is a need to resolve the following problems:
    1. Degradation of soil fertility and impoverishment of rural products due to low productivity.
    2. Exit of productive activities due to low income
    3. Sedimentary problems in swamp areas and degradation of fishery resources.
    4. Degradation of forestry resources and extinction of wild animals
    5. Deterioration of rural living conditions due to the deterioration in water quality
    6. Development pressures due to population growth

**Alternatives of Monitor**

1. Change in land use
2. Erosion problems in the Upper basins
3. Sedimentation problems in swampy areas
4. Environmental aspect in the swamp area and fishery resources
5. Forestry problems
6. Water contamination
7. Reservation areas

**Implementation Method**

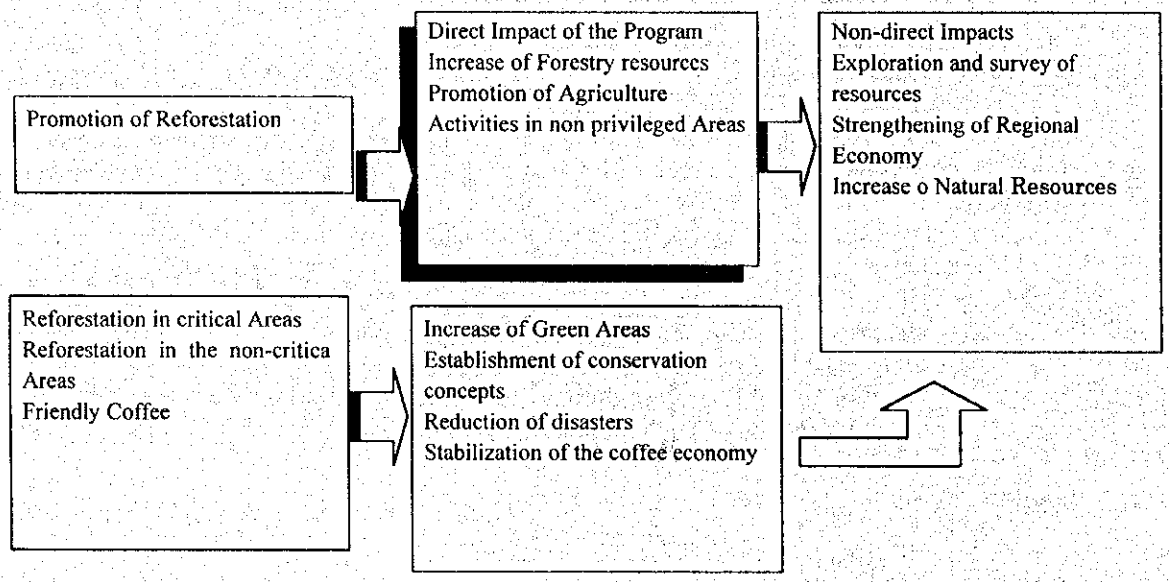
. It will be implemented with public funds.

## *8.4 Measures to be taken for Forestry Resources*

Potentiality of forestry resources in the region is very high, especially in the parts with gentle slopes due to the abundant rainfall and the relatively high fertility of soils. On the other hand, where slopes are steep, the abundant rainfall is not a potential factor but on the contrary they become an element of erosion. In order to prevent this phenomena it is indispensable to increase vegetative coverage so it plays a role of a conservation potential rather than a development potential.

Considering the factors mentioned above, the present Plan will be carried out adopting the following strategies:

- Promotion of reforestation activities in areas with high development potential
- Promotion of reforestation activities in areas in need of conservation measures.
- Promotion of reforestation activities in other activities such as crop promotion (environmentally friendly coffee)
- Conservation of forestry resources through the implementation of measures for the prevention of forestry fire.




### 8.4.1 Plan for the Promotion of Reforestation

**Plan Description**

- This Plan will be used as a substitute in the zones that are not apt for agriculture in Soconusco, as an alternative plan for economic activation where reforestation will be promoted.

**Alternatives**

- Reforestation will be promoted through credit lines for producers and official assistance policies such as the supply of plantlets, technical assistance and market information.
  1. Establishment of a system which supplies plantlets
  2. Technical assistance
  3. Facilitate market information
  4. Establishment of a credit line to promote reforestation

**Eligible areas**

- The zones where the potential for reforestation development is high and they are not apt for other crops. Regions where there is low economic yield of existing crops and there is the possibility to be converted to forestry areas. It will be carried out in areas less than 800 m above sea level.

### 8.4.2 Reforestation in Most Critical Areas

**Substitution Plan for Reforestation Promotion**

- This substitution plan will be carried out in the zones where it deems necessary to develop conservation activities. Considering and foreseeing the need for conservation in the zone, plantlets will be provided and distributed together with technical assistance with government budget and the producer will participate by planting and taking care of the plants. In this zone replanting trees for reforestation purpose is not recommended and therefore species that can be collected without replanting will be used as much as possible.

**Objective areas**

- Eligible areas are the ones identified as environmental conservation zone according to the land use classification map.

### 8.4.3 Reforestation in Areas to be Conserved

**Reforestation Alternatives**

- Reforestation for conservation of areas with steep slopes (higher than 35 degrees) are going to be implanted where needed. This activity is considered as a conservation action, therefore the implementation cost of reforestation will be subsidized by the government and planting and caring of trees will be carried out by the participation of farmers. The government will subsidize part of the cost of planting the trees.

**Objective Areas**

- The areas eligible are the ones identified as environmental conservation zone according to the land use classification map.

**Implementation Method**

- Due to the environmental conservation nature, the government will cover part of the cost of the plan (seed supply, cost of plantlet planting, etc.). The farmers will take care of the planting and provide the land.

### 8.4.4 Increase of Forestry Resources by Promotion of Friendly Coffee in Environmental Framework

**Alternatives**

. The Present Plan will promote environmentally friendly coffee through the promotion of activities to improve the production and increase vegetal coverage. The following measures will be carried out to promote these activities:
    1. Introduction of native shadows
    2. Cooperation with authorized organism
    3. Studies for authorization
    4. Creation of a commercialization network

**Objective Areas**

. Objective areas are those with the possibility of producing good quality coffee in altitudes higher than 800m and with a slope steeper than 35 degrees.

**Implementation Method**

. The farmers will participate with own resources and part by public funds from the government.

## *8.5 Implementation Program and Cost Estimate*

### 8.5.1 Description of the Implementation Program

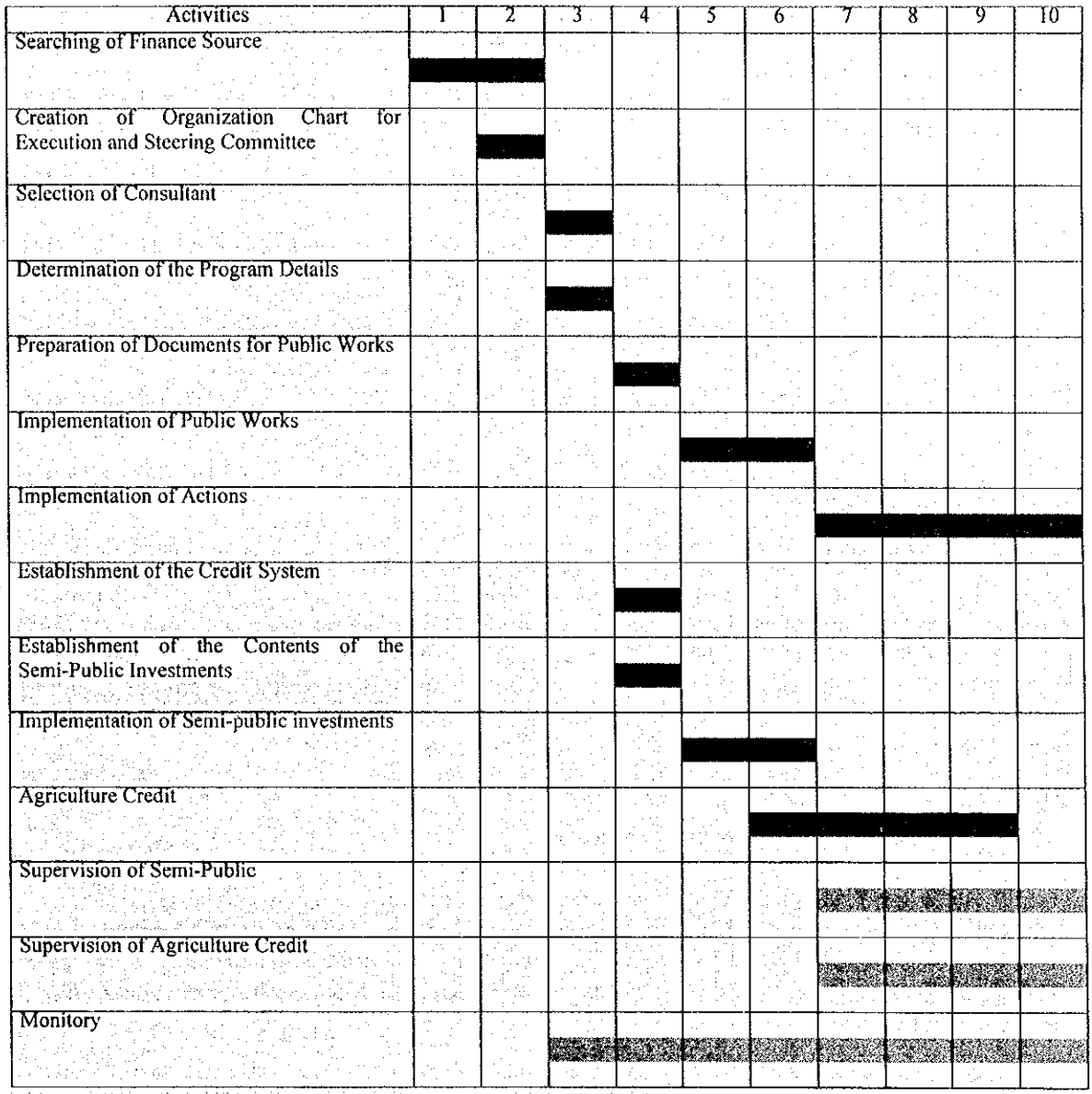
. The Promotion Program of Ecological Agriculture has great importance in its implementation to be able to conserve natural resources, degraded at the present time. For the implementation of this program, the necessary actions are required to be taken for the financing and methodology of its operation.

. Considering that the program is composed of different actions, it is necessary to establish a program for them. The necessary measures to implement the program are the following:
    1. Look for the Financial Funds
    2. Determine the details of the Program (Credit flow, Methodology and Implementation chart, Responsibilities of the Government)
    3. Implementation of the program (Credit and Public Investments)
    4. Implementation of Investments of Public Actions (Environmental education, Monitoring)
    5. Implementation of semipublic Investments.

### 8.5.2 Implementation Program

The following is the implementation program:

Implementation Chart




Monitory Actions shall be carried out by the Committee and shall be formulated:

### 8.5.3 Cost Estimation

The costs required to implement the Program are US$ 267 millions of which US$ 99 millions shall be use to implement the program, and is formed by US$ 7 millions from public investment, 17 millions from semi-public investment and 74 millions of agriculture credit.

Estimation Cost

| | Required Resources (US$1,000) | Program (US$1,000) |
|---|---|---|
| Promotion of Sustainable Agriculture | 652,440 | 261,040 |
| Promotion of the use of Regional Resources | 25,583 | 12,187 |
| Promotion of Reforestation | 1,635,120 | 557,650 |
| Subtotal | 2,543,390 | 940,560 |
| Studies | 127,160 | 47,020 |
| Program | 2,670,550 | 987,580 |
| Public Investment | 150,750 | 70,610 |
| Semi public Investment | 308,930 | 174,970 |
| Agriculture Credit | 2,210,870 | 742,000 |

## *8.6 Program Evaluation*

The program has the objective to introduce several measures to improve the qualities of soil, especially the land used for coffee, cacao, and cultivated land with annual crops that are products of great importance for the region. Through this program the necessary measures with a specific surface of 410 thousand hectares will be introduced. Especially in the land used inadequately, other alternatives will be introduced, such as reforestation, promoting the adequate use for the land situations. The area classified as qualified is more than 25%, it is noticeable in the case of coffee especially.

## *8.7 Initial Environmental Evaluation*

To formulate the plan, in spite that the considerations between economic development and environmental conservation were taken in consideration, the following are inevitable to determine the details of the Program. The problem that could arise is discrepancies between plans and actions. To prevent this type of problem, the committee should do close monitoring the implantation of the program.

The Study on Integrated Agriculture, Livestock and Rural Development Project of the Soconusco Region (Master Plan) has as a main objective to put into gear a system of agricultural and livestock sustainable development that will make possible for future generations to continue the agricultural and livestock production under the same ecosystem that regional farmers enjoy. In order to achieve this, the present Master Plan pretends to improve the agricultural and livestock production by increasing the income derived from them amongst low income farmers through the optimization of the use of natural resources and the development in harmony with the environment.

The Master Plan, which is made up of five sectorial programs related to rural development, strengthening of the agricultural and livestock sector and ecological conservation, has revealed as a result of this study that the execution of the contemplated programs will have a substantial impact on the reactivation of the agricultural sector, which is now confronting a long stagnation period in spite of its main role in the regional economy, the acceleration of the natural resource conservation and the invigoration of rural society, thanks to the tangible and intangible benefits.

To be able to facilitate the execution of the programs and projects of the Master Plan in a timely and efficient way, it is recommended that the public dependencies take the following actions:

## 1. Master Plan

### (1) Immediate execution of the Priority Plans

It is imperative to materialize as soon as possible the two priority plans: Integrated Project for the Improvement of Agricultural and Livestock Productivity of Low Income Farmers and the Plan for the Promotion of Ecological Agriculture. For this, the collaboration of federal and state government, as well as of the multilateral organisms is required.

### (2) Execution of Programs and Projects by Stage

The implementation by stages is required for the programs and projects excluded by the priority plans. It should be mentioned that the sectorial programs such as the Strengthening of Agricultural and Livestock Sector and the Development of Hydroagricultural and Rural Infrastructure, which require a considerable investment, should be implemented by stages in order to alleviate the acceleration of the socioeconomic disparity amongst sub regions in Soconusco when implemented. Furthermore, it is advisable that the study on disaster in the Novillero River basin is carried out immediately to formulate preventive and corrective measures in order to reduce future damages.

### (3) Tight relationship amongst the Executing Agencies of the Plan

The main executing agency of the present Master Plan will be SAG, but it is indispensable that a Implementation Committee for the Master Plan is established where SAG can collaborate tightly with the other public offices such as SAGAR, CNA, COPLADE, SEMARNAP and SERNyP, which are related to the programs and projects contemplated in the Master Plan.

At the same time, it is a condition to strengthen SAG's institutional capacity regarding planning and project execution.

### (4) Strengthening of Agricultural Loans

In order for low income farmers and those with a small capital to get into diversifying their rural activities to liberate themselves of the present practice of low productivity monocultivation and as a consequence, to increase their agricultural income with an incentive of privilege interest rates for loans, it is required that the State of Chiapas prepares the road to formulate various innovative programs for the financing and creation of special credit loans.

## 2. Pre-Feasibility Study

### (1) Special Arrangement for Financing

The Plan for the Promotion of Ecological Agriculture is deemed to be implemented with a loan from foreign government or international banking institution. In order to channel this resource exclusively to the beneficiaries of the plan, it is critical to establish a new banking agency within the State of Chiapas or to create a special credit line targeted for the said beneficiaries.

### (2) Promotion for Farmers' Organization

In order to enable farmers to be more accessible to agricultural technology transfer and extension services and rural finance system, as well as to undertake marketing of their harvests, it is indispensable to organize them. In this sense, it is advisable that public entities relevant to implementation of the present Master Plan should orient farmers who have interest to undertake priority project to form organization as immediately as possible.

### (3) Agricultural Technology Transfer

Crops to be introduced for the projects of the improvement of agricultural and livestock productivity of low income farmers, are not familiar to the farmers. Accordingly, it is necessary to enforcement of relationship between the agricultural engineers of municipalities in the project areas and the public and private organizations who render the extension services for the smooth implementation of the sub-projects by the low income farmers.

### (4) Agricultural Products Processing

The intensive processing plant to be employed in the Mixcum area is considered for minimum influence for environment by the waste water and residue of coffee processing. To promote this installation, it is requested by the public independents for the financial and technical assistance to realize it.

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## FINAL REPORT

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## ABBREVIATIONS AND ACRONYMS

| Abbrev.. | Name of Organization |
|---|---|
| AAL | Asociación Agrícola Local<br>(Local Agricultural Association) |
| ASERCA | Apoyos y Servicios a la Comercialización Agrícola<br>(Support Services for Agricultural Marketing) |
| BANCRI | Banco de Crédito Rural del Istmo<br>(Rural Credit Bank of the Isthmus) |
| BANRURAL | Banco Nacional de Crédito Rural<br>(National Rural Credit Bank) |
| CADER | Centro de Apoyo para el Desarrollo Rural<br>(Rural Development Support Center) |
| CDS | Convenio de Desarrollo Social<br>(Social Development Agreement) |
| CEIDPHPACH | Centro Estatal de Investigación y Desarrollo de la Producción Hortofrutícola de Plantaciones Agroindustriales de Chiapas<br>State Research and Development Center for the Hortifruitculture Production of Agroindustrial Plantations in Chiapas) |
| CETES | Certificados de la Tesorería de la Federación<br>(Federal Treasury Bills) |
| CEAS | Comisión Estatal de Agua y Saneamiento (Estado de México)<br>(Commission for Water and Drainage, State of Mexico) |
| CEC | Comisión Estatal de Caminos<br>(State Road Commission) |
| CIICA | Centro Internacional de Investigación y Capacitación Agropecuaria<br>(International Agricultural and Livestock Research and Training Center) |
| CNA | Comisión Nacional de Agua<br>(National Water Commission) |
| COESCAFE | Consejo Estatal del Café<br>(State Coffee Commission) |
| CONAPO | Consejo Nacional de Población<br>(National Population Council) |
| CONASUPO | Compañía Nacional de Subsistencias Populares<br>(National Basic Foods Company) |
| COPLADE | Comité de Planificación de Desarrollo Estatal<br>(State Planning Committee) |

| | |
|---|---|
| CDS | Convenio de Desarrollo Social<br>(Social Development Agreement) |
| DDR | Distrito de Desarrollo Rural<br>(Rural Development District) |
| DIF | Sistema Nacional para el Desarrollo Integral de la Familia<br>(National System for Integrated Family Development) |
| ECOSUR | El Colegio de la Frontera Sur<br>(The Southern Border College) |
| FIRA | Fideicomisos Instituídos en Relación con la Agricultura<br>(Trust Fund for Agriculture) |
| FIRCO | Fideicomiso de Riesgo Compartido<br>(Trust Fund for Shared Risk) |
| FISM | Fondo para la Infraestructura Social Municipal<br>(Fund for Municipal Social Infrastructure) |
| FOCIR | Fondo de Capitalización e Inversión Rural<br>(Rural Capital and Investment Fund) |
| GATT | Acuerdo General en Comercio y Aranceles<br>(General Agreement on Trade and Tariffs) |
| IDH | Indice de Desarrollo Humano<br>Human Development Rate |
| IHN | Instituto de Historia Natural del Gobierno del Estado<br>(Natural History Institute of the State) |
| IMSS | Instituto Mexicano del Seguro Social<br>(Mexican Institute for Social Security) |
| INE | Instituto Nacional de Ecología<br>(National Ecology Institute) |
| INEA | Instituto Nacional para la Educación de los Adultos<br>(National Institute for Adult Education) |
| INEGI | Instituto Nacional de Estadística, Geografía e Informática<br>(National Institute of Statistics, Geography and Information) |
| INI | Instituto Nacional Indigenista<br>(National Indigenous Institute) |
| INIFAP | Instituto Nacional de Investigaciones Forestales y Agropecuarias (National Institute for Forestry, Agriculture and Livestock Research) |
| ISMAM | Indígenas de la Sierra Madre de Motozintla-San Isidro Labrador<br>(Sierra Madre of Motozintla- San Isidro Labrador Indigenous People) |

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| JICA | Agencia de Cooperación Internacional del Japón<br>(Japan International Cooperation Agency) |
| NAFINSA | Nacional Financiera S. A.<br>(National Finance Company) |
| PEA | Población Económicamente Activa<br>(Economically Active Population) |
| PEAT | Programa Elemental de Asistencia Técnica<br>(Elemental Program for Technical Assistance) |
| PIB | Producto Interno Bruto<br>(Gross Domestic Product) |
| PNGE | Programa Normal del Gobierno Estatal<br>(State Government TNormal Program) |
| PNUD | Programa de las Naciones Unidas para el Desarrollo<br>(United Nations Development Program) |
| PNAE | Programa Normal de Alcance Estatal<br>(Normal Program with State Scope) |
| PROCAMPO | Programa de Apoyos Directos al Campo<br>(Farm Support Payments Program) |
| SAG | Secretaría de Agricultura y Ganadería del Gobierno del Estado<br>(Secretariat of Agriculture and Livestock, State Government) |
| SAGAR | Secretaría de Agricultura, Ganadería y Desarrollo Rural<br>(Secretariat of Agriculture, Livestock and Rural Development) |
| SATI | Servicios de Asistencia Técnica<br>(Technical Assistance Services) |
| SCT | Secretaría de Comunicaciones y Transporte<br>(Secretariat of Communication and Transport) |
| SDE | Secretaría de Desarrollo Económico para el Estado<br>(Secretariat of Economic Development for the State) |
| SDUCOP | Secretaría de Desarrollo Urbano, Comunicaciones y Obras Públicas<br>(Secretariat of Urban Development, Communications & Public Works) |
| SEDESOL | Secretaría de Desarrollo Social<br>(Secretariat of Social Development) |
| SIG | Sistema de Información Geográfica<br>(Geographical Information System) |
| SERNyP | Secretaría de Ecología, Recursos Naturales y Pesca del Gobierno del Estado<br>(State Secretariat of Ecology, Natural Resources ad Fishery) |

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| SNICS | Servicio Nacional de Inspección de Semillas (National Seed Inspection Service) |
| SPR | Sociedad Productiva Rural (Rural Productive Society) |
| SRA | Secretaría de Reforma Agraria (Secretariat of Agrarian Reform) |
| SSS | Sociedad de Solidaridad Social (Social Solidarity Society) |
| TLC | Tratado de Libre Comercio de América del Norte (North American Free Trade Agreement, NAFTA) |
| UAIM | Unidad Agrícola Industrial de Mujeres Rurales (Agro-Industrial Unit of Rural Women) |
| UNACH | Universidad Autónoma de Chiapas (Chiapas Autonomous University) |

## ACRONYMS

| | |
|---|---|
| $Km^2$ | Kilómetros Cuadrados (Square kilometers) |
| % | Porciento (Percentage) |
| $ | Pesos mexicanos (Mexican pesos) |
| US$ | Dólares estadounidense (US dollars) |
| ha | Hectárea (Hectare) |
| msnm | Metros sobre el nivel del mar (Meters above sea level) |
| m | Metros (Meters) |
| $m^3$ | Metros cúbicos (Cubic meters) |
| Qq | Quintal (57.9 kg para café pergamino y 46 kg para café oro) (Measurement for coffee, 57.9 kg for pergamino coffee and 46 kg for oro coffee) |
| kg | Kilogramo (Kilogram) |
| Ton | Tonelada (Ton) |
| seg | segundo (second) |