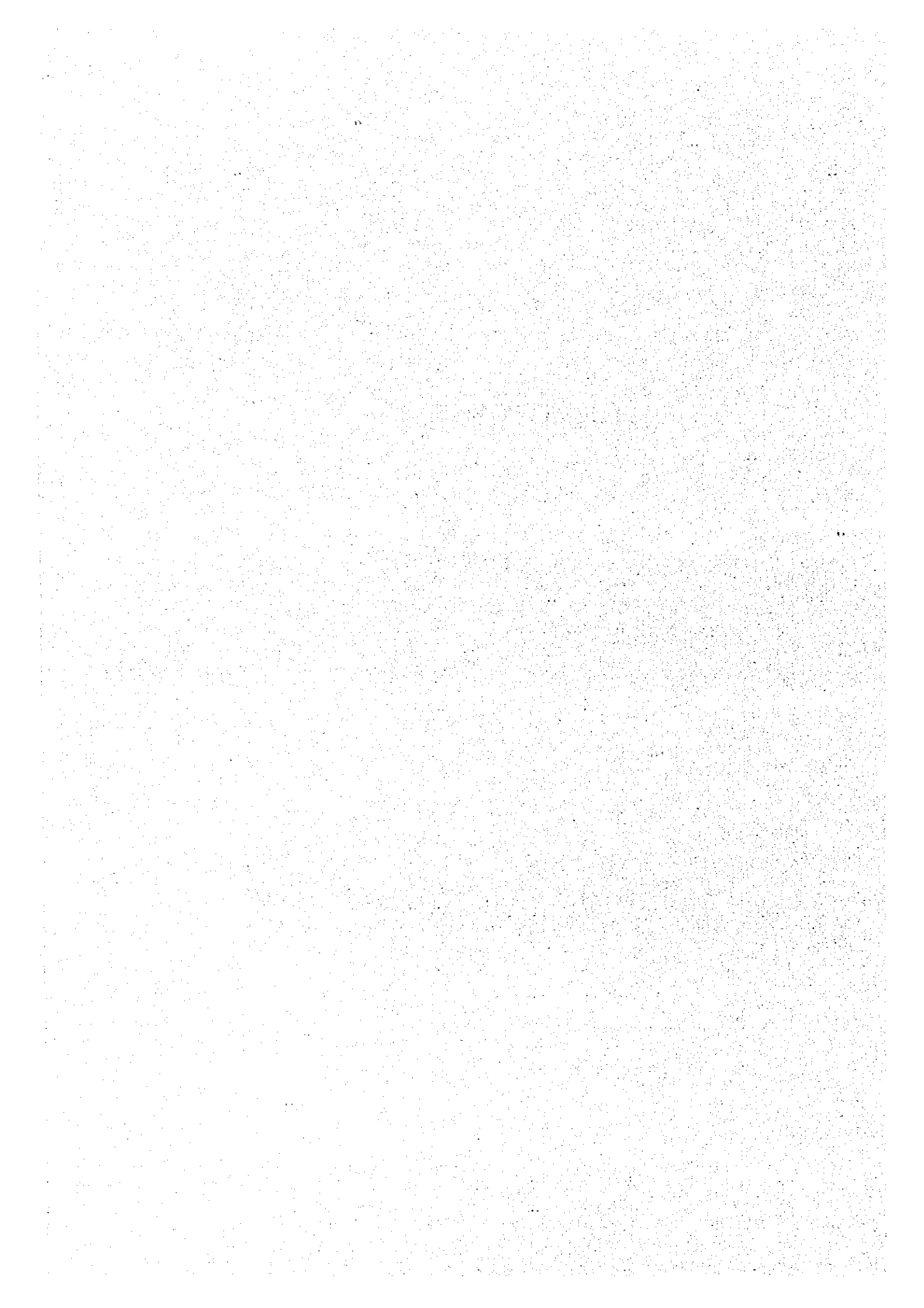


CHAPTER 5

PRIORITY PROGRAMS AND PROJECTS



CHAPTER 5

PRIORITY PROGRAMS AND PROJECTS

5.1 Regional Development Program

5.1.1 Outline of the Program and Selection of Model Development Region

(1) Outline of the Program

The regional development program which conceives to formulate an integrated agricultural and livestock development plan aims to invigorate regional economic activities and, in turn, to put regional development into reality. This development proposal shall comprise presentation of land use plan in conformity with local natural conditions, agricultural production plan with attention paid to environmental conservation, institutional supporting services intensification plan, marketing system development plan and other relevant plans, and socio-economic impact on implementation of combined these plans shall be assessed so that an optimum proposal for regional development should be exposed.

In this Master Plan Study, model development region shall be selected from ten (10) regions of the State and development proposal pertaining to this model regions shall be presented subject to comprehensive diagnosis of the natural and socio-economic conditions of the region. Subsequent to this presentation of proposal, study on regional development shall be conducted, which is followed by formulation of implementation program to facilitate implementation of development proposal..

(2) Selection of Model Development Region

The selection of model development region was made with applying such indispensable criteria as comparative advantage in development and coincidence with development policies of the state government and the North Region was identified as the highest priority region supported by its favorable physical conditions, the level of development of traffic infrastructure and maturity of social and economic conditions, as explained in the section 4.2.2 of the Chapter 4. Consequently, and with exchange of opinions with state government, this North Region has been chosen as a model development region to which regional development scheme of the state will be proposed.

5.1.2 General Description of the North Region

(1) Salient Feature of the Region

1) Location, Area and Population

The North Region lies in the northern part of the state of Taconites lies with latitude 6 – 8° S and longitude 47 – 49° W and is surrounded by the Taconites river to the east and the Araguaia river to the west. The total extension of the region is 21,082.1 sq. km. The region is divided administratively into 13 municipalities, of which the municipality of Araguaia occupies the leading municipality. The population of the region is estimated to be 172,447 in 1996 and it had been grown with annual rate of 2.6% recently.

2) Soils and Topographic Conditions

The soils with the class 1 through the class 3, which are evaluated as suitable soils for crop farming, are extended to the west of the Federal Highways BR-153 & BR-226 (Belem – Brasilia Highway) which pass through the region from south to north. In contrast, with exception of some sectors, the greater portion of the eastern part of the region is covered with sandy soils of the class 5 which are unsuitable for both agricultural and livestock uses. Hilly lands with an average elevation of around 300 m are found to the west of the federal highways mentioned before; the rest of lands in the region are extended in the elevation range of 140 – 170 m, except for hilly lands in a couple of municipalities located on the basin area of the Taconites river.

(2) Prevailing Agriculture & Livestock Production

1) Agriculture

This sector plays less important role within the state; the 1994/95 data indicate that the region occupies within the states as small portion as 7.0% in cultivated area and 5.2% in output of major crops.

This activity is engaged in its great majority by medium or smaller holders. The total extension of their holding reach close to 900 thousand ha., but the actual cultivated area is lowered to only 280 thousand ha. This crop production activity is thus not recognized as an industry in the market economy of the region.

2) Livestock

The number of head of cattle raised as of 1995 is 1,137,200 (IBGE/TO), which accounts for 20.29% of the total number of heads in the state occupying the primary position in number of head. Likewise minor animals such as hog, sheep, goat, poultry, etc. are

raised predominately in terms of their numbers within the state. Thus, the region is biased to livestock farming.

Nevertheless, the productivity of the sector has shown downside slide for a couple of years and decreased returns of farming becomes a serious issue among producers. The region's products face difficulty in maintaining their comparative advantage in their major marketing destinations.

5.1.3 Profile of Development Proposal

In formulating development plan of the North Region, it is important to take into account of the region's comparative advantage over the rest of regions of the State and to position the Region as a model region for gathering momentum to proceed with regional development in the future.

(1) Land Use Plan

Actual lands in the Region are not adequately used in conformity with their potentials. As prerequisite for formulating development plan, an inventory of actual land use by municipality classified into pasture, crop land, fallow land, idle land and urban and alienated area should be prepared immediately containing information on extension and delineated map for respective land use.

An agricultural land use plan is to be forged referring to information of soil classification made based on physical and chemical property of soils, topography, etc. Soils with the class 2 and the class 3, which are apt for crop cultivation, account for more than half (51.6%) of the regional lands and the great majority of the rest of lands are represented by lands apt for forest. Because the Region is located within the Legal Amazonian Area, only 50% of potential development lands are allowed to use for crop and livestock farming.

Land Suitability Classification	Area (ha)	Proportion to Total Area(%)	Potential Development Area(%)
Crop farming	1,087,560	51.4	543,780
Pasture	1,087,560	51.4	543,780
Forest	2,010,890	94.4	1,467,110
Reserve	97,320	4.6	0
Total	2,108,210	100.0	

(2) Agriculture Infrastructure Development Plan

The development of agricultural infrastructure is closely linked with regional agricultural development policies and is affected by agricultural production proposal. From the standpoint of natural resources and geographical position, the region in question is highly potential area for grains production. Nevertheless, in an attempt to

launching sustainable agricultural production, the proposal for farming shall be made not on the basis of mono-culture of grains but of combination of grains with animal production, vegetables and fruits and, in this context, agricultural infrastructure to be development shall comprise a wide variety of equipment and installations.

As for road network, the state government has already formulated its development plan; the development of roads for the area alienated from this development plan is suggested to be made in coordination with the regional development plan, that is essential to have advantage in operation and maintenance as well as in technical and economic viewpoints.

The present region is generally favored with abundant water resources and the potential for development of irrigation system is considered to be high accordingly. But, for accurate analysis of this potential, it is vital that climatological and hydrological inventory including water discharge of major river systems throughout the year should be made in more sophisticated manner.

(3) Farming System Development Plan

1) Issues and Strategies for Development of Agriculture and Livestock Sector

Crop Farming

The depressed crop production of the Region is attributable to immature marketing information system, absence of appropriate farming technology, deficient provision of agricultural inputs including machinery with regard to the crops which are highly suitable to local soil and climatological conditions and are promising in markets. The under-development of marketing and sales system constitutes another bottleneck which discourages produces from expanding crop production. Issues and strategies are as summarized below:

Issues to be Tackles	Strategies for Development
- Diversification farming activity among large livestock farmers	- Introduction of grains and beef cattle production with crop-pasture rotation system
- Development of New Production Units (Intensification of Land Use)	- Production of grains (crop-pasture rotation) - Creation of new organization (Public corporation, etc.)
- Encouragement for expansion of farming activity	- Expansion of public market - Consolidation of traffic infrastructure - Establishment of domestic and international market information system

Livestock Farming

The deteriorated productivity in recent years is closely linked with loss of high quality pasture caused by degradation of soil fertility. On the other hand, in so far as marketing of products is concerned, the protection of animal health and quality and the cost of transportation are highlighted. Taking this situation in mind, issues and strategies are summarized as follows:

Issues to be Tackled	Strategies for Development
- To mitigate the progress of soil degradation and to cultivate high quality pasture	- Implementation of crop-pasture rotation and innovated technologies for beef cattle farming
- To strengthen market competitiveness of products	- Upgrading animal health protection system, promotion for exportation and consolidation of traffic infrastructure
- To diversify livestock activity	- Encouragement of dairy industry and swine farming

2) Crop Production Diversification Plan

Crop farming in the North Region is inactive in comparison with other regions of the state. An intensification of use for these arable lands is a pressing issue which should be tackled in the course of the formulating agricultural development proposal of the North Region. This development proposal shall comprise development of grains production which is foreseeable under the international circumstances of supply and demand of foodstuff as well as promotion of fruits and vegetable production which is anticipated in response to increased demand at markets both inside and outside the state.

As for production of grains (rice, maize, soybean, etc.), it is highly recommended that, in view of attaining sustainable production of land resources with mitigation of the progress of soil degradation, the crop-pasture rotation system should be put into implementation for development of new production units contemplated under the regional development program and for promotion of sustainable agriculture.

The proposed farming system for diversification of crops is to create joint-operation farm of small holders, which is composed of mixed farming of grains and livestock, mixed farming of vegetables and livestock and fruits production

3) Modernization of Livestock Activity

The main development strategy of the livestock activity the Region is to elevate its productivity and to enhance its quality by means of putting into force of preventive measures for soil degradation and growing improved pastures and the scenario to accomplish this strategy is an introduction of crop-pasture rotation farming. This farming is expected to attain substantial increase of grains production in parallel with maintaining elevated productivity of livestock activity and to contribute to realize more

flexible farm operation and, in turn, to upgrade market competitiveness of the Region supported by its advantageous geographical position.

This diversification of livestock activity leads, without doubt, to development of animal feed manufacturing industry and, in turn, to generation of job opportunities as its side-effect.

(4) Social Infrastructure Development Plan

The development of road network is relatively advanced and, according to the development plan of the state government, all of municipalities of the Region will be connected with the Federal Highway BR153 (Belem – Brasilia Highway) by the year 2007/08 contributing to considerable saving of transportation time. Road system development to be involved the regional development plan is thus required to be coordinated with this development plan. The other nature of social infrastructure will be formulated with emphasis laid on activation of rural area.

(5) Agro-products Marketing System

In the agriculture and livestock sector of the North Region, the marketing system of cattle such as channel and method for their shipment has been consolidated. By contrast, that for other crops is rudimentary, so its consolidation constitutes a momentous agenda. Unless this consolidation should be put into force, the enterprise to proceed modernization of livestock activity and diversification of crops would not come true. In this sense, the consolidation of marketing system, which should be made in paralell with production development plan, is proposed as described hereinafter.

1) Crops

Rice:

The productivity (unit yield) and quality of harvests are the primary concern of the grain in marketing. This means that with the productivity inferior to the national average reasonable profit would not be assured to producers, which, in turn, would spoils an industrial background of the product. Likewise, as the market guarantees higher price to higher quality of product, inferior quality of product would be shut out from the market, in addition to being disadvantageous to producers.

Under the circumstances, a survey on production factors of rice in developed regions of the country is necessary so that the production of rice in the region might be established a comparative advantage or comparative equivalence in the domestic market. With establishment of this comparative advantage or equivalence, the marketing of rice will be made without serious bottleneck, judging from prevailing domestic market practice

of the grain.

Brazilian rice would not be exportable in the short run, but may be the case in the medium and long run, so production of high quality rice to be traded at international market is advisable. It is commonly recognized that the supply and demand of rice would be balanced internationally by 2020, so development of new productive lands of rice would be an international expectation.

Soybeans:

Soybean is exported in three different form: in beans, bran and crude/refined oil and its marketing channel is generally as follows; beans are shipped from producers to major traders/exporters (CARGILL, CEVAL, SANTISTA, etc.), and the latter processes the grain for shipment of international market. Of the three forms of exportable soybean mentioned before, oil and bran are also traded at domestic market. In this process, large-scale storage facility (silo) and oil extraction factory are generally constructed and operated by major traders/exporters.

In addition, the State of Taconites, in particular the North Region, will be benefited greatly by the completion of the South-North Railroads to unit Estreito with Imperatriz; with this completion the marketing route from the origin of production to the export port of Sao Luis (Itaqui) shall be secured and the region shall bear comparative advantage due to saving of transportation cost. It is worth while to point out that the shipment from the port of Itaqui to the European markets shall have comparative advantage in comparison with the shipment from the neighboring countries like Argentina, Paraguay and Uruguay.

In the port of Sao Luis (Itaqui) exporting infrastructure of soybean is equipped; loading facility of soybean is already installed and construction of oil extraction factory is underway.

If the production of soybean should put into force in large extension in the North Region, it is suggested that intermediate storage facilities would be installed and operated by association/cooperatives formed by producers, and grains thus stored would be transported by themselves directly to the silo of exporters. The installation of this type of facility would surely contribute to producers, because they can ship their grains observing fluctuation of prices at international markets. To enable this enterprise it is essential to beef up forwarders which undertake shipment of the region's grain.

Maize:

This grain also constitute an exportable product, but the local product is not valid for exportation because of its inferior quality. Thus priority in marketing of this grain

should be given to improvement of its variety. With improvement of variety, the local product may be exported in the medium and long run.

The importance of production of maize in the North Region is closely linked with promotion of swine farming proposed in livestock development of the present regional development program. The milled maize in combination with rice bran, mandioca, etc. is an important and nutritious feed for minor animals which is actually imported from the South and Central Regions of the country (mainly the state of Goias). Realization of self-sufficiency of animal feed would benefit greatly to swine farmers and, in turn, to regional economy of the state.

The strategy to foster animal feed processing industry through production of maize is considered to be an important strategy from the standpoints for diversification and modernization of the regional agro-industry. Furthermore, poultry farmers in and around Brlem in the adjoining state of Parana get feeds from the state of Goias, and an animal feed processing industry to be established in the region would have a comparative advantage.

Vegetables (including feijão):

At present, the great majority of vegetables consumed in the urban area of the state of Taconites are imported from the Central and South Regions of the country, mainly from the state of Goias. Under the circumstances, the target for production of vegetables in the North Region shall be realization of self-sufficiency within the region as well as within the urban area of the state of Taconites in short and medium term. The proposed constraints on marketing of vegetables are deficit operation of farming and excess of output s well as competitiveness in quality.

In order to relax the said constraints, it is of importance that the public organizations including the state government should conduct market survey consistently so that producers may be accessible to necessary marketing information which will serve them in selection of the kind of vegetables to be cultivated and in deciding the amount of harvests to be shipped.

As producers learn adequately about marketing system, free competition of market will be secured, and the desirable market where the quality governs the competition will be formulated. As a premise for establishment of desirable market, it is essential that public market, as an entry place of local products, should be operated for conducting free and fair transactions of middle men. In addition, as cited in the section of soybean, fostering of forwarders should also envisaged.

Fruit:

It is recommended that specialization of crops in the region would be made after making identification of comparative advantage of the region in terms of quality and productivity of fruits.

Besides, referring to the climatological characteristics of the other part of the county outside the state, the selection of fruits which can not be produced in other regions due to climatological conditions, may be a practical proposal.

Post-harvest loss is a serious problem in development of fruits production, so expansion of marketing destination from inside the state to outside the state would be hard to come true unless refrigeration system including vehicles equipped with cooling devices to maintain quality of products would be incorporated.

Fruits to be produced in the region are expected to be shipped to domestic market in the short and medium term, but some of them (tropical fruits and cashew) are potential exports in the long term, provided that their processing industry should be established.

2) Animal Products

Beef Cattle

To make above producers' wish feasible, it is prerequisite that the commercial facilities (supermarket and so on) of the Northeast Region of the country – the major destination of the region's animal products – should be consolidated; with this consolidation measures such as a standardization for quality of meats, an establishment of open auction market of meats will be taken for creation of new marketing channel. Detailed methodology for this proposal shall be presented at the opportunity of next step of the regional planning.

Swine

As for swine industry, which has not been developed in the region, an establishment of its marketing mechanism is critical in present regional development program. For this purpose, the marketing information on evolution of prices and supply and demand of meat (actual situation and future projection) should be surveyed with regard to development regions of the industry in the country so that the marginal marketing price (potential sales price) and the marginal marketing quantity (projection of demand in the future) might be foreseen.

Subsequent to above-mentioned survey, technical proposal on swine farming (to be described in detail afterward) will be presented and, on the basis of the technical

coefficient of this proposal, the production cost swine farming will be calculated so as to evaluate the feasibility for development of swine farming. With premises of this feasibility study an establishment of the marketing channel of swine which comprises installations of processing facility (public and private) and open auction market should be proceeded. In this regards, it is important to undertake the diffusion of information on products of regional swine to both within and outside the state.

Dairy Products

It is important that producers should undertake cattle breeding system which entails reduced production cost. In the short run, it may be necessary that an arrangement to regulate an output of milk production compatible with demand should be embarked, subject to implementation of survey on demand of dairy products within the region, the state and the surrounding states; on the other hand, in the medium and long runs, referring to the diversification of preference of consumers in the future, the expansion of market for supply of raw materials for dairy industry should be also anticipated.

(6) Follow-up Issues on Further Investigation

It is disclosed that the North Region is the most highly potential region in Tocantins despite the region confronts a number of issues to be tackled. In order to hasten regional development projects follow-up actions represented by implementation of a detailed study to verify projects' economic feasibility and their contribution to environmental and social aspect of both regional and state economy should be taken.

Such basic information as actual land use and land tenure, which are being compiled by the state government at present, are expected to be completed as early as possible so that the said study is to be conducted in satisfactory manner.

5.2 Agricultural Production Supporting System Strengthening Program

5.2.1 General Profile of the Program

The present program, which envisages to give indirect support to the agricultural farming technologies of the regions to be developed under the regional development program, has a principal objective of enhancement of quality in agricultural production. The program consists of the following four components, namely:

Subprograms	Projects
Institutional Reform	<ol style="list-style-type: none"> 1. Land Titling and Registration System Improvement 2. Structural Reform of SAG 3. Structural Reform of RURALTINS 4. Plants Inspection and Quarantine System Improvement
Livestock Sector Modernization	<ol style="list-style-type: none"> 1. Establishment of Animal Disease-Free Zone 2. Strengthening of Animal Health Structure
Agricultural Technology Research and Extension Organization	<ol style="list-style-type: none"> 1. Strengthening of UNITINS Agricultural Division at Gurupi 2. Strengthening of School of Veterinary Medicine of UNITINS
Human Resources Development	<ol style="list-style-type: none"> 1. Agricultural Vocational Training 2. Educational Institutions Strengthening 3. Farmers' Organization Promotion 4. Improvement of living conditions of rural women

The administrative organizations in Tocantins were created 10 years ago when the State of Tocantins was established to have been separated from the State of Goias. These organizations are still rudimentary in structure without being equipped with necessary facilities to perform their functions satisfactorily. Under the circumstances, the program in question proposes to strengthen agriculture-related organizations of the state government for the target year of 2015 in advance to implementation of the agricultural and livestock development. This program, although its benefits are not anticipated to be generated immediately, proposes to consolidate basic installation and equipment during the initial 5 years, followed by implementation of strengthening measures for the subsequent medium and long terms, in view of supporting farmers to realize sustainable crops and livestock production.

5.2.2 Institutional Reform Sub-program

This subprogram shall consist of the following components, namely:

1. Formulation of state agricultural policies, implementation of plants and animals quarantine and disease control, provision of agriculture-based information and data, assistance in agricultural technologies development (to be engaged by SAG)
2. Extension services and technical assistance to farmers (to be engaged by RURALTINS)
3. Administration of and guidance in rational use of lands in the state (to be engaged by INTERTINS)

With structural reform of three organizations cited above, the fundamental condition for future development of the State of Tocantins shall be set forth. The subprogram is

composed of the following five projects; apart from structural reform projects relevant to these three organizations, two projects of SAG related with plants quarantine and inspection are added in view of their different nature.

1. Land Titling System Improvement
2. Structural Reform of SAG
3. Structural Reform of RURALTINS
4. Strengthening of Plants Inspection System
5. Strengthening of Agro-products Quarantine Systems

Features of these projects are as described hereinafter.

(1) Land Titling & Registration System Improvement Project

1) Outline of the Project

This project contemplates an improvement of land titling services, procurement of equipment required for the services and clarification and systemization of the services and its executive agency shall be INTERTRINS. The target of the project is to ease unstable farm operation through completing land titling of approx. 6 millions ha.

2) Objectives

The objectives of the project are as follows.

1. To assure the effective access of small rural producers, subject to the condition of occupants, to production support public services, as well as to technical assistance and rural credit.
2. To promote the planning and increment of productive activities development in consonance with the basic requirements of natural resources and energy conservation and adequacy to the environmental conditions.
3. To promote the survey and materialization of all the land related mesh in the State.
4. To identify the real stock of public lands, incorporated to the State patrimony.

3) Project Rationale

An efficient and smooth implementation of the regional development shall not be in reality unless clarification of land titling and elaboration of land use map should be made. At the same time, safe trading and delimitation of public lands are indispensable and for this purpose an establishment of proper land titling system is an important task.

As of May 1997, the extension of lands to have been completed titling account for 21,750,800 ha, equivalent to 78% of the total territorial area of the State of Tocantins. With actual progress, it is scheduled to take another 20 – 30 years for the completion of land titling for the remaining 22% of lands, thus the implementation of this project, which envisages to complete the services in 10 years, is justified. The project comprises the following three components:

1. Empowerment and increase in number of human resources
2. Introduction of expertise and equipment
3. Elaboration of basic cadastral map and streamlining of procedure for land titling

It is worth while to point out that land titling is an important factor in getting rural credit and in promoting consistent investment of farmers.

4) Contents of the Project

The contents of the project are as listed below.

1. Cadastral operation (Location and ownership, etc.)
2. Definition of future functions
3. Elaboration of future land use plan
4. Incorporation of data bank
5. Establishment of land titling system
6. Provision of materials and equipment for investigation and elaboration of cadastral map

5) Cost and Schedule for Implementation of the Project

The project is scheduled to be implemented in 10 years from 1999 to 2009 and the cost is estimated as follows.

Project Cost:

Capital:	R\$ 600,000
Recurrent:	R\$ 1,200,000 (R\$120,000/Year)
Total	R\$ 1,800,000

6) Executing Agency

The executing agency of the project shall be INTERTINS, with support from SEPLAN and SAG. At the implementation stage, another support from RURALTINS, UNITINS and state government is anticipated.

(2) Structural Reform of SAG

1) Outline of the Project

SAG is an agency directly involved in agricultural sector of the State of Tocantins. At present, its services are not rendered in a satisfactory manner in such fields as effective agricultural planning and development in appropriate farming technologies suitable to local conditions. The structural reform of SAG is essential in attaining activation of agricultural production activity and shall comprise the following components.

1. Structural reform of SAG
2. Strengthening of technologies development sector

The former aims to realize an expansion in quality and quantity of manpower and installations, while the latter's target lies on establishment of the structure in charge of research and extension of technologies relevant to sustainable farming practice suitable to local conditions by means of consolidation of recipient organization for technical cooperation. The installations to be supervised by this technologies development sector cover not only those for demonstration and research of relevant technologies but also for extension of developed technologies to producers.

2) Objectives of the Project

The main objective of the project is the strengthening and restructuring of the SAG to allow it to fulfill its role as the organism for the promotion of the agriculture and livestock development in the State.

And, in specific objectives, the project contains:

1. To restructure and expand the execution local units and regional services units.
2. To supply SAG with physical and human resources for the implantation of actions in the fulfillment of concerning legislation.
3. To contribute to the increase in productivity and product quality through the structuring of a demonstration unit for the adaptation and definition of sustainable agricultural technology.
4. To promote the qualification and updating of SAG human resources aiming to improve the performance and utilization of state labor force, with the optimization of applied resources.

Local units of SAG are deficient both in human resources and in equipment, so their improvement is vital in enhancement of the quality of agricultural produces of the state. Furthermore, with fulfillment of manpower engaged in technological research,

technologies suited to local conditions will be developed.

3) Project Rationale

Because of shorter period since incorporation, SAG has not attained its structural consolidation yet without performing adequately its services in the fields of agricultural research, plants quarantine, grading of agricultural produces, disease control of animals, etc. Structural reform of SAG is hence of importance if the state government should seek for promoting agricultural research suited to local conditions together with upgrading in quality of agro-products. Supported by agricultural sector's comparative advantage over that of adjacent states, strengthening of SAG in Tocantins justified in view of its direct contribution to economic vitalization of industrial sector of the state.

Apart from above merit, strengthening of research and extension of agricultural technologies shall permit preparation of bases to receive technical cooperation from outside the state, which in turn shall result in realization of sustainable farming. The state government has a plan to receive technical cooperation from EU and this may serve as catalyst to grow this kind of bilateral and multi-lateral technical cooperation; furthermore, it is expected that technical transfer would be conducted from EMBRAPA and it would serve to improve technologies research and development sector and to accelerate development of appropriate technologies suited to local conditions.

4) Contents of the Project

(Restructuring of SAG)

1. Structural reform
2. Strengthening of agricultural research sector

Actual structure of SAG is not consolidated in such manner as is capable of engaging in future agricultural development, so the above restructuring aims to reinforce SAG's structure so that it may undertake definition of state agricultural policies, agricultural development planning and development and extension of agricultural technologies.

(Structural Reform of SAG's Central Office)

1. Procurement of necessary materials and equipment
2. Incorporation of marketing information center
3. Establishment of central experimental station (soil analysis, plants quarantine, animal disease control, etc)

This component shall have objective to proceed with crop farming to adapt soil conditions through organizational arrangement in formulating agricultural planning and

in supplying marketing information relevant to agricultural products. The marketing information center is anticipated to serve farmers with dissemination of marketing information after proper compilation and processing and the central experimental station is proposed to help farmers in reinforcement of their competitiveness in quality and marketing of agricultural products.

(Manpower Expansion Plan)

1. Agricultural engineers, veterinary doctors, administrative staff, etc.

Although SAG's manpower is not deficient in number at present, its expansion is required to upgrade SAG's services responsive to future agricultural development in Tocantins. Within context of manpower development program, an increase of staff is proposed.

(Enlargement of Local Units)

1. Construction of regional and local units
2. Provision of necessary installations
3. Procurement of materials and equipment

Regional and local units play an important role in control of quality of agro-products at regional and local level, but deficient manpower has prevented these units to perform their services satisfactorily. This proposal seeks for relaxing of this constraint.

(Upgrading Animal Disease Control System)

1. Establishment of three animal health protection laboratories annexed to the regional units.
2. Incorporation of central laboratory annexed to the central office
3. Construction of fixed posts for animal health protection
4. Procurement of materials and equipment

This component, although it is concerned with strengthening subprogram of plants and animals disease control system to be described subsequently, is included in this program because of its necessity to procure materials and equipment.

(Promotion of Technological Development)

1. Establishment of central administrative unit
2. Incorporation of local experimental stations (administration office and experimental field).

3. Procurement of materials and equipment

In this promotion proposal, basic research attributable to extension services at the central administrative unit and extension services and technologies development suited to local conditions are to be undertaken at local experimental stations.

5) Cost of the Project

The cost required for the project is estimated as follows.

Components	Cost (RS x 1000)		
	Capital	Recurrent (Initial 3 Years)	Total (Initial 3 Years)
Strengthening of central unit	2,100	900	3,000
Improvement of regional and local units	2,310	3,000	5,310
Establishment of laboratories	1,450	1,000	2,450
Strengthening of research and extension system	9,000	5,000	14,000
Total	14,860	9,900	24,760

6) Implementation Schedule

The project is scheduled to be carried out in the following schedule.

Component/year	98/99	00/01	02/03	04/05	06/07	08/09	10/11	12/13	14/15
Strengthening of central unit		- P -	- C -						- O/M -
Improvement of regional and local units			- P -	- C -					- O/M -
Establishment of laboratories			- P -	- C -					- O/M -
Strengthening of research and extension system	- P -	- C -							- O/M -

Note: P: Preparatory Period, C: Construction Period, O/M: Operation and Maintenance Period

(3) Structural Reform of RURALTINS

1) Outline of the Project

Bearing an important role of RURALTINS within the context of expansion of agricultural productive activities, this project contemplates to strengthen supporting services to farmers and the basic actions to be required for strengthening the structure of RURALTINS are as enumerated hereinafter.

1. To restructure regional operation units to be capable to satisfy requisites of farmers, expanding and improving their installation and equipment.
2. To adequate operational units with upgrading capability of manpower.

The former action aims to improve prevailing structure so as to establish more effective

one in provision of extension services and for this purpose the consolidation of installation and equipment shall be made as short-term target of the project, meanwhile the latter has an objective to upgrade technical capability of extension workers to undertake improved provision of services responsive to evolution of farming technology as medium and long-term target of the project.

The executing agency of the project shall be RURALTINS with support to be provided by SAG.

2) Objective of the Project

The objective of the project is to adequate installation and equipment for reconstructing regional extension service units and to construct a training center to upgrade technical capacity of extension workers.

3) Project Rationale

Despite the agriculture and livestock sector constitutes the mainstay in economic activities in Tocantins, supporting services of the sector to farmers are unsatisfactorily due to deficiency in equipment and manpower. The agriculture and livestock integrated development plan contains rural credit program within agricultural promotion package and organizational strengthening of RURALTINS which undertakes an important role in agricultural supporting services is a premises before putting into implementation of this program. Extension services units incorporated at regional level are not performing effective operation at present, so the following measures are required to enhance its services.

1. Technical upgrading of extension workers at regional level.
2. Elevation of agricultural productivity through diffusion of appropriate farming technologies suited to local conditions.
3. Introduction of technologies which permit to facilitate optimum use and conservation of natural resources.
4. Leveling up of extension workers who are in charge of upgrading small farmers' farming technologies.
5. Enhancement of supporting services to enable farmers to get rural credit.

4) Contents of the Project

The project is composed of construction and re-structuring of regional units and establishment of a training center for upgrading capacity of manpower.

(Construction and re-structuring of regional unit: 31 units)

1. Construction and re-structuring of regional unit (31 units)
2. Incorporation of necessary installations and equipment
3. Expansion of extension equipment
4. Procurement of mobile equipment

(Establishment of a training center)

1. Establishment of a training center equipped with library, audio-hall, meeting room, dormitory, etc.
2. Procurement of materials and equipment for extension services
3. Procurement of materials and equipment for information service

5) Cost of the Project

The cost of the project is estimated as follows.

Components	Cost (RS x 1000)		
	Capital	Recurrent (Initial 3 Years)	Total (Initial 3 Years)
Construction and re-structuring of regional unit	8,750	300	9,050
Establishment of a training center	1,600	300	1,900
Total	10,350	900	10,950

6) Implementation Schedule

The project is scheduled to be carried out in the following schedule.

Component/year	98/99	00/01	02/03	04/05	06/07	08/09	10/11	12/13	14/15
Construction and re-Structuring of regional unit	- P -	- C -				- O/M -			
Establishment of a training Center		- P -	- C -			- O/M -			

Note: P: Preparatory Period, C: Construction Period, O/M: Operation and Maintenance Period

(4) Strengthening of Agro-products Inspection System

1) Outline of the Project

This project for strengthening of inspection system for agricultural products is composed of establishment of central laboratory, expansion of regional offices and modernization of data processing system.

2) Objective of the Project

This project, in view of facilitating marketing of agricultural products, seeks to carry out

adequately an inspection of quality for agricultural products within the State of Tocantins. This task enables to guarantee uniformity of quality for agricultural products and to facilitate trading of these products. The task also confirms the existence of chemical residues contained in agricultural products. In addition, it is expected that an improvement of quality should be attained with categorization of quality.

3) Project Rationale

The Brazilian Government in its multi-annual plan puts emphasis on major participation of international market and on reinforcement of competitiveness of the Brazilian products there and, as measures to attain these targets, the government intends to reduce its intervention in the market limiting it to improvement of related fields of economic sectors in such manner as to match the principles of market.

Inspection regulation on agricultural products in Brazil is established under the federal law and it is enforced in compliance with the agreement between the Bureau of Agriculture of the Federal Government and SAG in Tocantins. Target products of this inspection are rice, feijão, maize, sorghum, soybeans, cassava, vegetables and so on and inspection services are undertaken by SAG. Close to 400 thousand tons per year of agricultural products were inspected in the past, of which rice and maize represented 67% and 32%, respectively.

A total of 13 regional inspection offices have been established under supervision of quality control section of SAG and occasional office is established nearby the federal highway BR-153. At the inspection office established at the frontier with other states, confirmation of quality certificate is done; in case that no certificate is issued, this inspection office issues the certificate after making analysis of sampled products in compliance with agricultural products' standard.

4) Contents of the Project

The executing agency of the present project shall be SAG. It is proposed that SAG's function shall remain as it performs at present in the short run but, for effective performance of the function, it shall be limited to legislation of inspection system of agricultural products and administrative and supervisory task of inspection services entrusting inspection services to private sector in the medium and long run.

The inspection services shall be undertaken by three regional offices covering south, central and north part of the state respectively and inspection offices shall be established under guidance of these regional offices; the number of inspection office, which is 13 at present, shall be increased to 24 by the end of the project's target year.

The present project contains an installation of facilities and equipment, institutional

strengthening of responsible agency including an expansion in number and technical training of manpower and establishment of laboratory; central laboratory equipped with devices for physical and chemical analysis will be established in Palmas to conduct precise inspection entrusted by regional offices and inspection office located at states border shall be designed to interface customs and quarantine services with computer. Materials and equipment for regional offices shall be in such level as to carry out primary inspection of agricultural products. The implementation schedule is to be divided into two periods: up to 2005 and up to 2015.

5) Cost of the Project

The cost of the project is estimated as follows.

Component	Cost (R\$ x 1000)		
	Capital	Recurrent (Initial 3 Years)	Total (Initial 3 Years)
Procurement and installation of facilities and equipment	1,000	300	1,300

6) Implementation Schedule

The project is scheduled to be carried out in the following schedule.

Component/year	98/99	00/01	02/03	04/05	06/07	08/09	10/11	12/13	14/15
Procurement and installation of facilities and equipment		- P -	- C -				- O/M -		

Note: P: Preparatory Period, C: Construction Period, O/M: Operation and Maintenance Period

(5) Strengthening of Plants Inspection System

1) Outline of the Project

Nowadays, under free market economy, globalization of agricultural production and trading of agricultural products is accelerated. In South America, with start of MERCOSUL Brazilian agricultural sector is faced with hard competitiveness with other member countries. In order to tackle with this difficulty the Brazilian government sets out to beef up agricultural sector and to improve its competitiveness at international market by means of strengthening inspection and quarantine system of agricultural products which serves to facilitate better marketing and elevated quality of agricultural products.

On the other hand, it is a worldwide fashion to take up frequently an issue of plants and animals disease control in an attempt to protect domestic products, and Brazilian government is well aware that it is a matter of public concern to deal with this disease control so as to lay foundation stone for encouragement of private sector's participation

in the international market.

2) Objective of the Project

This project has an objective to carry out reliable and effective plants quarantine services through enhancement in its technical aspect of plants quarantine and treatment method in order to cope with an expansion in importation and exportation of agricultural commodities to be anticipated in the coming future. It is proposed that protection of agricultural products from the diseases caused by pests and/or pathogens should be attained to contribute to stable and elevated production, diversification and expansion in exportation of agricultural products in Tocantins.

3) Project Rationale

The Brazilian government in its multi-annual plan reckons re-construction and strengthening of plants quarantine system the role the public sector. Smooth implementation of plants quarantine services is an essential factor for facilitating trading of agricultural commodities, achievement of their stable production and expansion in their exportation to other states.

Plants quarantine services in Tocantins are undertaken by SAG with establishment of three inspection offices at state borders; major function of these offices is confirmation of certificates and it is not conducted satisfactorily due to deficiency of facilities and equipment.

So as to strengthen plants quarantine system it is of importance to import pest-free seeds and seedlings from other states. Seed production fields covered 1,695 ha in 1996 and SAG inspected about 4,000 tons of seeds, both produced in Tocantins and imported from other states. As a result of this inspection, it was confirmed that great number of seedlings of pineapple had been burned off being infected with a bacillus of Fusariose.

4) Contents of the Project

The project consists of:

- (a) To provide necessary laboratory in order to strengthen quarantine activities at states border quarantine offices which are facing with difficulties in performance of activities due to lack of materials and equipment and deficiency in technology as well as to enable to solve the problem in disposing plants contaminated with hazardous insects and/or pathogen.
- (b) To enhance managerial and technological functions of inspection offices with expansion in number of offices together technical staff engaging in inspection services; as long-term target, computer processing system for plants inspection and quarantine and its interface with custom services of ICMC shall be facilitated.

Future plants inspection and quarantine services in Tocantins are envisaged to be undertaken by 26 offices of ULSAV (Local Unit for Animal and Plant Health) and 24 fixed posts to cover the whole area of the state. To complement said fixed posts movable posts are proposed to be established at 10 sites. The laboratory shall be used jointly with other sectors.

5) Cost of the Project

The cost of the project is estimated as follows.

Component	Cost (R\$ x 1000)		
	Capital	Recurrent (Initial 3 Years)	Total (Initial 3 Years)
Procurement and installation of facilities and equipment	1,000	300	1,300

6) Implementation Schedule

The project is scheduled to be carried out in the following schedule.

Component/year	98/99	00/01	02/03	04/05	06/07	08/09	10/11	12/13	14/15
Procurement and installation of facilities and equipment		- C -	- P -						

Note: P: Preparatory Period, C: Construction Period, O/M: Operation and Maintenance Period

5.2.3 Modernization of Livestock Sector

This program, in view of encouragement of livestock production, seeks to develop animal disease-free zone network to cover the whole state and to elevate value-added of livestock products and the program is represented by activities for development of free-zone network and improvement of inspection system. The target year of the program is set forth as 2015.

(1) Establishment of Animal Disease-Free Zone Project

1) Outline of the Project

This project intends to develop free zone for FMD by the year 2000 and to monitor and control the classic swine fever (CSF) by the year 2015.

2) Objective of the Project

This program has objectives to eradicate FMD and classic swine fever to accelerate trading of livestock products in Tocantins to other state and to international market and to evolve livestock sector. Currently, vaccination against FMD has obtained significant

results, so the program aims establish animal disease-free zone network with reinforcement of this service in parallel with implementation of vaccination against CSF. In this context, an establishment of animal disease-free zone for respective municipality shall be established one by one.

3) Project Rationale

When belonged to the State of Goias, animal disease control services had not been implemented properly in Tocantins, obtaining only very low incentives as for vaccinations and other disease control measures.

After having been independent, there is a constant concern about animal disease control programs in Tocantins, which led the State Government to make an agreement with the Federal Ministry of Agriculture and the World Bank aiming to control and afterwards eradicate the main infectious diseases.

Supported by specific legislation and mainly through campaign against protection of animal health, the Secretary of Agriculture is conducting vaccinations throughout the year, to minimize the losses caused by animal diseases which is clearly shown by the improvement of the attained FMD vaccination coverage indexes: from 17% in 1989 to 86% in 1997. Owing to this elevated proportion of vaccination, the number of animals infected with FMD has declined considerably from 104 in 1994 to 3 in 1997.

Swine farming is a promising activity within context of diversification and modernization of livestock industry, hence it is important to take measures against CSF, monitoring and controlling it, lest the disease should prevalent in Tocantins.

4) Contents of the Project

The program consists of the following components:

1. To elevate proportion for vaccination against FMD and CSF and to establish animal disease-free zone in order to publicize benefits of livestock farmers accrued from this service.
2. To strengthen animals quarantine system at states border in an attempt to prevent import of animals other than vaccinated ones from other states limiting this import of herd swine to those produced at eligible farms with a minimum disease (MD).
3. With supports from RURALTINS to establish gradually FMD- and CSF-free zone for respective municipality of the state to attain this free zone network covering the whole territory of the state.

5) Cost of the Project

The cost of the project is estimated as follows.

Component	Annual cost (RS 10 ³)
Vaccination	1,000

6) Implementation Schedule

The project is scheduled to be carried out in the following schedule.

Component/year	98/99	00/01	02/03	04/05	06/07	08/09	10/11	12/13	14/15
Vaccination						- O/M -			

Note: O/M: Operation and Maintenance Period

(2) Strengthening of Animal Health Structure

1) Outline of the Project

The project proposes to strengthen animal health inspection system with provision of necessary equipment and installation for the relevant service.

2) Objective of the Project

This project has objective to strengthen animal health laboratory to cope with an expansion of import and export of animals to and from other states and establishment of animal disease-free zone network. This project is expected to contribute to consistent production, elevated productivity and diversification of livestock sector as well as expansion in export of animal products to other states.

3) Project Rationale

At present, there are no qualified animal disease inspection and diagnostic laboratory in Tocantins, and if disease is identified within the state it is necessary to send infected animals to the Animal Support Laboratory located in the State of Belém, where virological, bacteriological and even parasitological tests are carried out and other chemical analysis. It is difficult for an institute to make proper diagnosis as it usually takes many hours until they receive a specimen from Tocantins. Moreover, a wrong specimen is sometimes delivered.

Laboratory for diagnosis of animal diseases is an indispensable installation for animal disease protection including establishment of FMD- and CSF-free zone.

The livestock sector plays an important role in economic activity of the State of Tocantins with its contribution to formation of the state's ICMC. Provision of laboratory capable of timely diagnosis of animal disease is vital factor to instruct livestock farmers

to take necessary measures against animal disease and protection of animal health to bring about major development of livestock sector in Tocantins. In addition, proper inspection system for livestock-related products such as milk, meat and egg is beneficial to consumers in the realm of provision of disease-free commodities.

Nowadays, import of improves species of cattle, swine and poultry from other states is prevailed in Tocantins, which sometimes accompanies outbreak of unconventional disease. This situation calls for establishment of proper action for animal health protection.

4) Contents of the Project

The project consists of the following components.

1. To construct a central laboratory equipped with equipment to conduct tests of virology, bacteriology, parasitology, pathology and biochemistry in Palmas.
2. To improve existing regional laboratories located in Araguaina and Gurupi.
3. To construct branch laboratory in Taguatinga, strategic location to control animal disease, to carry out simple diagnosis of animal disease and vaccination.
4. To provide each laboratory with vehicles equipped with necessary devices for diagnosis of animal disease at remote areas from each laboratory.
5. Central laboratory in Palmas shall conduct analysis of samples which is beyond length of regional and branch laboratories to establish animal disease control network in Tocantins.

5) Cost of the Project

The cost of the project is estimated as follows.

Component	Cost (R\$ x 1000)		
	Capital	Recurrent (Initial 3 Years)	Total (Initial 3 Years)
Procurement and installation of facilities and equipment	1,000	300	1,300

6) Implementation Schedule

The project is scheduled to be carried out in the following schedule.

Component/year	98/99	00/01	02/03	04/05	06/07	08/09	10/11	12/13	14/15
Procurement and installation of facilities and equipment		- P -	- C -						

Note: P: Preparatory Period, C: Construction Period, O/M: Operation and Maintenance Period

5.2.4 Intensification of Agricultural Technologies Research and Extension Services

This subprogram aims to foster manpower and to lay foundation stone for research through strengthening of UNITINS Agriculture Division at Gurupi and School of Veterinary Medicine.

(1) Strengthening of UNITINS Agriculture Division at Gurupi

1) Outline of the Project

The outline of the project is as follows.

1. Strengthening and expansion of the Gurupi Campas – Agronomy Division
2. Strengthening of experimental stations at Gurupi and at Formosa do Araguaina
3. Installation of automatic weather stations
4. Integrated training, promotion and development of technology center for horticultural farmers

The executing agency of the project shall be the Foundation for the University of Tocantins and at implementation stage of the project technical and institutional support from SAG, RURALTINS and other research institutes represented by EMBRAPA are anticipated.

2) Objective of the Project

Prevailing facilities of UNITINS are deficient to conduct higher education, so the project seeks to strengthen these facilities to make an optimum utilization of human resources and, in turn, to upgrade educational system for proposed personnel to be engaged in agricultural development of the state. This project also proposes to contribute to agricultural research in tocantins.

3) Project Rationale

The University of Tocantins which is shortly named as 'UNITINS' is the only public university (now converted into a 'foundation') in the State of Tocantins. Although it has been functioning as a State University, it is now being converted into a foundation which is supported by the Federal Government, State Government and private organizations.

The Campus of Gurupi is one of the main bases of the University of Tocantins

Foundation. The activities began in 1992 with the philosophy of integrated development of teaching and research. As one of its main strategies, the campus made partnerships with other national and international agriculture research institutes in order to carry out joint research works, apart from its participation in the National System for Agricultural Research coordinated by EMBRAPA. After five years of working, the University Campus of Gurupi has grown, covers a bigger area, has developed and presently it needs to improve its role as well as structures and the conceptual bases.

Since foundation, UNITINS has played an important role in development of technological research in Tocantins owing to capable and eligible manpower. Nevertheless the lack of proper installation and equipped laboratories have made difficult to produce anticipated results.

4) Contents of the Project

(Strengthening and Expansion of the Gurupi Campus – Agronomy Division)

To be constructed two blocks for classrooms and other facilities such as duly equipped laboratories, theater, dining hall, library, bank agencies, administration rooms with proposed total area of 9,400 m². Apart from construction of building, the laboratories for 1) Soil science, 2) Agriculture biology, 3) Plants pathology, microbiology and chemistry, 4) Animal nutrition and food technology, 5) Seeds technology, and 6) Data processing system are conceived.

(Strengthening of the Experimental Station at Gurupi)

This component is composed of:

- Acquisition of experimental area
- Construction of necessary infrastructure
- Supply of machinery, equipment and vehicles
- Hiring of human resources
- Supply of consume material

(Strengthening of the Experimental Station at Formosa do Araguaia)

The following activities need to be carried out in order to strengthen the activities of the experimental station at Formosa do Araguaia

- Restructuring of the existing facilities
- Contraction of firm for restructuring of the area (production area)
- Construction of infrastructure for implantation of confinement
- Reform of the existing machinery

- Hiring of Human resources
- Supply of vehicles

(Installation of Automatic Weather Stations at Gurupi and Rio Formosa)

It is planned to install two automatic weather stations at Gurupi and Rio Formosa.

(Integrated Training, Promotion and Development of Technology Center for Fruit and Vegetal Farmers - NUTIFH)

NUTIFH is an extension activity of the University Campus of Gurupi - Agronomy Division, to be carried out in Palmas with the purpose of supplying service to the green belt farmers and surrounding areas (Porto Nacional, Paraiso, Miracema and others). Therefore, through the implementation of this program, the farmers may have the opportunity to know and adopt the technologies generated by the researches carried out in UNITINS.

5) Cost of the Project

The cost required for the project is estimated as follows.

Components	Cost (R\$ x 1000)		
	Capital	Recurrent (Initial 3Years)	Total (Initial 3Years)
Strengthening and expansion of the Gurupi Campus	8,500	200	8,700
Experimental station at Gurupi and Formosa do Araguaia	800	100	900
Installation of automatic weather stations	100	-	100
Technology center for hotifruticultural farmers	200	-	200
Total	9,600	300	9,900

6) Implementation Schedule

The project is scheduled to be carried out in the following schedule.

Component/year	98/99	00/01	02/03	04/05	06/07	08/09	10/11	12/13	14/15
Strengthening and expansion of the Gurupi Campus	- P -	- C -							
Experimental station at Gurupi and Formosa do Araguaia		- P -	- C -						
Installation of automatic weather stations			- P -	- C -					
Technology center for hotifruticultural farmers			- P -	- C -					

Note: P: Preparatory Period, C: Construction Period, O/M: Operation and Maintenance Period

(2) Strengthening of School of Veterinary Medicine of UNITINS

1) Outline of the Project

The present project envisages to strengthen educational and research environment of the School of Veterinary Medicine of UNITINS located in Araguaina. As the case of the project for strengthening of UNITINS Agriculture Division at Gurupi, the Foundation for the University of Tocantins shall be the executing agency of the project.

2) Objective of the Project

The objective of the project is to contribute to development of livestock sector in Tocantins through provision of facilities and equipment and strengthening of educational system.

3) Project Rationale

The School of Veterinary Medicine of the UNITINS offers the only veterinary degree in the state and UNITINS is one of the newest university in the nation. The undergraduate degree course's in veterinary medicine was established in 1992 in the UNITINS Araguaina campus. This school of veterinary medicine constitutes the only two schools of veterinary medicine in the North Region of the country; the other one is found in the Federal University of Belém.

Although, in January, 1997, the first batch of 16 veterinarian students are graduated, but their employment condition's aren't clear. Because of the School of Veterinary Medicine facilities have been designed to handle former EMBRAPA equipment, instrument and machinery which are too old and out of date. The prevailing acute shortage in diagnostic material and consumable, and the confined space, have severely restricted the range diagnostic procedures each student can learn.

As a result, numbers of inadequately trained veterinarians are entering a job market which is not expanding significantly but is limited to administrator of animals at private livestock farms.

With actual 23 professional teaching staff, the provision of new equipment and facility is expected to contribute greatly to enhancement of teaching capacity of these staff.

Today animal health plays an important role in accelerating the development of the livestock and poultry sector in Tocantins. With a progress of modernization of the livestock sector, the demand for veterinary surgeons shall be expanded in the livestock sector of the State and for the service of public health. To cope with this demand,

present project is justified because it aims to strengthen educational environment of veterinary surgeons. Apart from educational aspect, the project is designed to contribute to diversification of livestock activity and introduction of unconventional farming practice of crop-pasture rotation system among livestock farmers of the State. In sum, the project seeks to construct a network for industry-university joint work and to generate significant benefits for development of livestock sector in Tocantins.

4) Contents of the Project

The project comprises the following components:

1. Provision of equipment for the school
2. Establishment of dairy research laboratory
3. Expansion of cattle experimental farm

5) Cost of the Project

The cost required for the project is estimated as follows.

Components	Cost (R\$ x 1000)		
	Capital	Recurrent (Initial 3Years)	Total (Initial 3Years)
Provision of equipment for the school	2,200	300	2,500
Establishment of dairy research laboratory	200	-	200
Expansion of cattle experimental farm	300	-	300
Total	2,700	300	3,000

6) Implementation Schedule

The project is scheduled to be carried out in the following schedule.

Component/year	98/ 99	00/ 01	02/ 03	04/ 05	06/ 07	08/ 09	10/ 11	12/ 13	14/ 15
Provision of equipment for the school	- P -	- C -							
Establishment of dairy research laboratory		- P -	- C -						
Expansion of cattle experimental farm		- P -	- C -						

Note: P: Preparatory Period, C: Construction Period, O/M: Operation and Maintenance Period

5.2.5 Human Resources Development Subprogram

The institutional services of public organizations in the State are not rendered adequately due to deficiency in development of human resources. Thus, strengthening for development of human resources is essential to upgrade expertise of farmers. Furthermore, implementation of the following projects is proposed for introduction f

unconventional farming technologies, promotion of rural organization and amelioration of rural environment.

1. Agricultural Vocational Training Project
2. Educational Institutions Strengthening Project
3. Farmers' Organization Promotion Project

In view of immediate need of human resources development, these projects are scheduled to be put into implementation in the short term of the integrated development plan.

(1) Agricultural Vocational Training Project

1) Outline of the Project

The project which is formulated towards the development plan consists of the following two subprojects:

- 1) Strengthening of training system for RURALTINS staff.
- 2) Strengthening of RURALTINS on-farm training and rural life improvement training for rural women

2) Objectives of the Project

The objectives of the project are the improvement of rural producers and RURALTINS staff qualification. Furthermore, through the rural life improvement training for rural women, it is expected to stabilize rural life and to raise the social status of rural women.

3) Project Rationale

At present, the agriculture and livestock activities depend on traditional techniques of cultivation and cattle raising. This situation constraints the increase in productivity and the introduction of new technologies. Furthermore, the lack of knowledge about farm management on crop cultivation and animal raising among the extension staff generates distrust on technical assistance by farm producers.

It will contribute to the increase of agricultural productivity, introduction of new crops, and promotion of livestock industry. Besides it is also aimed to improve the rural life conditions which, compared to those in urban areas, are very precarious. It is verified that the improvement of these conditions is hindered by the lack of community leaders despite the great demand by the rural population. These conditions can be changed with the community development attained through training courses for improvement of rural

life conditions to be taken by women, within the same PARTICIPATION principle before mentioned.

4) Contents of the Project

(Strengthening of the Training for RURALTINS Staff)

This subproject is represented by preparation of the training programs for RURALTINS's staff.

1. Preparation of the training program at professional updating level
2. Preparation of the training program at specialization level
3. Preparation of the training program at master degree level

The above training programs will be prepared in collaboration with EMBRAPA, UNITINS and other relevant institutions and the contents and expertise of the programs will be as follows.

- Methodologies of design on regional development plan, farm design, and farm management design, and technical and managerial evaluation of farming.
- Study methods on soil properties and identification of right lands for crop and fruit cultivation.
- Methods on mechanized cultivation for cereals and pastures.
- Technologies of prevention of soil degradation, preservation of the environment, increase of yield and improvement of quality, reduction of production costs, and animal hygiene.
- Post-harvest technologies
- Technologies on vegetables and fruit cultivation, and animals and poultry raising.
- Methodologies of maintenance and operation of irrigation facilities and farm machinery.
- Methods of establishment and management of farmers organizations
- Agricultural information system and market information
- Method of Rapid Participative Diagnosis (DRP)
- Social assistance system and its evaluation
- Technologies on rural life improvement (nutrition, health and hygiene, education, income generation, home economics, etc.)

(Strengthening of On-farm Training Programs and Rural Life Improvement Training Programs for Rural Women)

The details of this program consist of preparation of on-farm training program for

farmers and rural life improvement training programs for rural women, both of which are undertaken by RURALTINS. These programs shall be implemented inline with demonstration farm program. Contents and expertise are as given hereinafter.

- Methods of mechanized cultivation for cereals and pastures
- Technologies on soil degradation prevention in order to allow the performance of sustainable agriculture, environmental preservation, increase of yield and improvement of quality, reduction of production costs, and animal hygiene.
- Post-harvest technologies.
- Technologies on vegetables and fruit cultivation, and animals and poultry raising.
- Methodologies on operation and maintenance of irrigation facilities and farm machinery.
- Methods of establishment and management of farmers organizations.
- Methods of farm household management and farm bookkeeping
- Rural life improvement (nutrition, health and hygiene, education, income generation, home economics, etc.)

(2) Educational Institutions Strengthening Project

1) Outline of the Project

The program is composed of the strengthening of agriculture vocational education institutions (high school level), towards to the development plan. The strengthening of two technical schools of agriculture and the establishment of a new one will be conducted in this program. The proposed schools are as follows:

1. Natividade Technical School of Agriculture and Livestock attached to UNITINS (existing) - South region
2. Pedro Afonso Technical School of Agriculture of the Tocantins State (existing) - Central region
3. Araguaina Technical School of Agriculture and Livestock attached to UNITINS (new establishment) - North region

2) Objectives of the Project

The objectives of the program is in accordance with the vocational education promotion of agriculture which is one of the main policies of the country and the state agricultural sector. The strengthening of agricultural vocational education aims to increase the production, modernize the sector through the implementation of the development master plan and, mainly, the improvement of the formation level of the rural Men and his living conditions.

3) Project Rationale

A conspicuous disparity is observed among existing agro-technical schools in terms of teaching materials, qualification of teachers and provision of facilities and equipment and the existing precarious agricultural educational institutions may cause obstacle for proceeding integrated agricultural development. Therefore, the improvement of teachers qualification, elaboration of a curriculum adapted to regional characteristics, and provision of educational facilities and equipment and materials which meet the new concept of educational institutions, will be materialized by implementing the program.

4) Contents of the Project

(Natividade Technical School of Agriculture and Livestock - Attached to UNITINS)

This school will have a center position as for the vocational education of agriculture in Tocantins State, and the provision and renovation of the school facilities and educational equipment and materials will be planned.

(Pedro Afonso Technical School of Agriculture of the Tocantins State)

the school will have a center position for regional agricultural education in the Central Region comprising project area of PRODECER III. Securing of qualified teachers, improvement of teachers qualification, reconstruction of school facilities and provision of educational materials and equipment are contemplated in this subproject.

(Araguaína Technical School of Agriculture and Livestock - Attached to UNITINS)

With a view to promote the agriculture and livestock development in the North Region of Tocantins State, this school will be newly established in Araguaína. The school facilities will be constructed at the site of the Faculty of Medical Veterinary, UNITINS.

5) Cost of the Project

Technical Schools	Cost (R\$ x 10 ³)		
	Construction and Expansion of Facilities	Provision of Equipment and Materials	Total
Natividade	700	1,000	1,700
Pedro Afonso	100	600	700
Araguaína	1,000	900	1,900
Total	1,800	2,500	4,300

6) Implementation Schedule

The reconstruction of the mentioned two schools (Natividade and Pedro Afonso) will be

implemented from the first year of this program on. The reconstruction works will be completed at the second year. Provision of educational equipment and materials and securing of qualified teachers will start at the second year.

7) Executing Agencies

- Pedro Afonso technical school of agriculture and livestock ⇒ State Secretariat of Education and Culture
- Natividade technical school of agriculture and livestock ⇒ UNITINS
- Araguaina technical school of agriculture and livestock ⇒ UNITINS

8) Financing Method

The funds for this program will be raised by a loan of international financing institutions and subsidies from the federal and state governments. In case of Araguaina technical school of agriculture and livestock, the funds will be raised by a loan of international financing institutions, subsidies from the federal and state governments, and funding support from FAET-Rural Syndicates.

(3) Farmers' Organization Promotion Project

In this program, promotion of farmers' organization in the Bico do Papagaio region will be conducted. However, in the future, this program can be extended to other regions of the State.

1) Outline of the Project

The program consists of three programs on the promotion of farmers' organization aiming to strengthen rural community in the Bico do Papagaio region (Extreme North region according to the administrative division of SEPLAN), region which is one of the less developed in the State.

1. Strengthening of RURALTINS social assistance activities
2. Promotion and activation of rural producers' associations
3. Promotion of rural women organizations

2) Objectives of the Project

The program aims to promote the establishment of rural producers' associations which is being pushed forward by the Ministry of Agriculture, i.e., farmers' organizations formed by farmers who practice familiar agriculture, and activation of existing associations' activities, strengthening the associations supporting system. Furthermore, through the promotion of rural women organizations, it is foreseen the improvement of

the social status of rural women and rural community life environment.

3) Project Rationale

In the region, most of the people are landless and mini farmers, and it is verified a high population density and poverty. Presently, associations are established in the whole settlements. However, most of the associations are only nominal ones, acting only for request of public credit. In particular, farmers' organizations of small-scale farmers who live in the southern and eastern parts of the region are very few, and farmers' sense of community work are lower than that in the northern area of the region. Accordingly, the rural community environment shows no sign of improvement.

Therefore, by implementing the program, the promotion for the establishment of rural producers' associations which assists to familiar agriculture will contribute to strengthen and stabilize the rural community, improving the farming and living environments of small-scale farmers and mini farmers in the region. In order to reduce the regional disparities, the establishment and activation of associations in the whole rural area is an important problem to be tackled.

Activities of rural women are not remarkable except for some limited communities. Consequently, the program aims to improve rural women status through the formation of women groups and/or associations and through incentives for community participation, contributing to improve the rural community and living environments in the region. Further the results of the rural women organizations activities will contribute to the diffusion of women organizations throughout the whole State.

4) Contents of the Project

(Strengthening of RURALTINS Social Assistance Activities)

Conditioned to the proposal of RURALTINS institutional reform, the program will be drew up for preparation of the training program of farmers' organization for extension staff and provision of extension materials.

(Promotion and Activation of Rural Producers' Associations)

The program consists of the promotion of the organization of rural producers' associations and activation of the existing ones. In the northern area of the Bico do Papagaio, there are strong farmers' organizations, but the organizations of the middle east and the south areas are weak and few. It is worthy to say that in most of the associations, even the most organized ones, the "culture of demand" is very strong. Therefore, the promotion for the organization of associations and activation of existing ones will be planned establishing strategies to widen the concept of association.

1. Preparation of the program for promotion and activation of rural producers' associations
2. Implementation of the program of promotion for the organization of the associations

(Promotion of Rural Women Organization)

Although there is already in the Bico do Papagaio a well organized rural women association (ASMUBIP), the formation of women groups in the rural communities and the strengthening of their activities support will be planned. In the future, this program can be adopted in other regions of the State.

1. Preparation of the program for promoting the organization of rural women

5) Implementation Scheme

(Strengthening of RURALTINS Social Assistance Activities)

In this program, training courses based on the training program for social assistance staff will be implemented regularly at the central training center in Palmas.

(Promotion and Activation of Rural Producers' Associations)

Following the program and schedule prepared, the promotion and activation of rural producers' association for farmers of rural communities and members of existing associations will be implemented by RURALTINS staff, members of the Lumiar Project, and APA-To staff.

(Promotion of Rural Women Organization)

Supported by RURALTINS social assistance staff, members of the Lumiar Project, APA-To staff, and ASMUBIP staff, the promotion of rural women organization will be implemented in the rural communities where there is no organized women group. Also, the support by PACS agents will be expected.

6) Implementation Schedule

This program will be implemented from the initial stage of implementation of the development plan (Master Plan).

7) Executing Agencies

The RURALTINS shall be the agglutinating agent of the program implementation, working in cooperation with the associations, FAET, FETAET, INCRA-Lumiar and other concerning organizations.

8) Financing Method

The funds for the program implementation will be raised from the State budget (RURALTINS) and international NGO funds. In this sense it is important to assure to RURALTINS an adequate budget compatible with the importance of the work to be carried out.

5.3 Environment Conservation Program

5.3.1 General Description of the Program

Although constituting a part of the conservation region under the Amazonian Law, the lands of Tocantins covered with forest has been reduced to limited area with scarce vegetation of virgin forest, as a consequence of disordered deforestation which had been accelerated in the 70's; the start of livestock activity in this decade had brought about switching of virgin forest into pasture together with burning off of pasture for its maintenance and these practices had resulted in environmental conditions vulnerable to degradation of soil fertility, erosion of soils and air contamination. In particular, disordered practice of burning off undertaken by farmers has emitted great amount of smoke containing carbon dioxide gas, apart from said degradation of soil fertility, and it has entailed obstacle for traffic human health, as a direct negative effect and has lead to global warning, as indirect negative effect. The practice of burning off has another negative effect like hindering lands from recuperating their fertility and vegetation.

The amount of emission of carbon dioxide gas in Brazil in relation with the transition of land use surpasses the total amount of carbon dioxide gas in Japan and they are caused in their great majority by burning off practice conducted in the Amazonian Region; the State of Tocantins occupies the leading position in terms of frequency of the burning off practice. The most unworthy practice is disordered burning off of pasture that is carried out in excess of necessary acreage. It is informed that farmers put burning off of pasture in practice without being supported reasonably and they may cease the practice without relying on highly sophisticated technologies, if social factors should be eased.

In so far as agricultural production is concerned, an extensive livestock constitutes the leading activity of the State without realizing rational use of land resources and burning off is carried out as the promptest way to maintain pasture. In these pastures, vicious

circle of burning off-degradation of soil fertility-extensive cattle farming prevails.

In order to enhance natural environmental conditions of the State, it is essential to put into force of measures to curb factors for deteriorating environment represented by burning off in conjunction with enlightening for environmental monitoring and education, upgrading lands' profitability, etc. In this sense, it is advisable to implement measures for strengthening of public sector's role pertaining to environmental issues and for attracting private sector's investment in improvement of environmental condition.

(1) Outline of the Program

Under the present program, in an attempt to attaining environmental improvement and conservation of natural resources of the State, the following components shall be put into implementation.

- Environmental Conservation (Promotion of sustainable forestation, control of burning off, mitigation of water contamination, environmental enlightening and education and establishment of environmental monitoring system)
- Green Village (Improvement of rural environment, sustainable farming model, promotion for rural organization for specific areas)
- Demonstration program

Considering the characteristic of the Program, it was divided in 3 categories:

PART A; Agricultural Credit

PART A1; Credit for the Environment Preservation Program

PART A2; Credit for the Green Village Program

PART B; Supply of Goods

PART B1; Construction of Buildings

PART B2; Supply of equipment and machinery

PART B3; Third Service

PART C; Management of the Program

PART A represents a credit line that may contribute to the improvement of the environment quality. It shall be simultaneously promoted the efficient utilization of production forces (farmers) in order to reactivate the state economy.

PART B represents a government action that aims the introduction of new cultivation technology and monitory, including basic investments that may bring benefit for the population.

PART C represents the control of the program component created to improve the implantation by itself.

The Government shall play the role of dynamizer agent of the activities within the Implementation Program, setting the guidelines to reach the sustainable development that include some subsidies and technical assistance for the introduction of new agricultural techniques.

The role of the government and the private sector are summarized as follows:

PART	Private	Government
PART A	<ul style="list-style-type: none"> To invest in productive activities respecting the environment To increase the production based on sustainable method To preserve the Environment reducing the deterioration causes 	<ul style="list-style-type: none"> To Supply favorable Credit lines To Promote the activities the credit subsidy system To direct the utilization of credits for the environment preservation
PART B	<ul style="list-style-type: none"> To make an appropriate use of the activities To learn the importance of environment To preserve the natural resources 	<ul style="list-style-type: none"> To equip and supply infrastructure destined for the promotion of adequate technologies To control the actions that deteriorate the environment
PART C	<ul style="list-style-type: none"> To make suitable use of credit lines 	<ul style="list-style-type: none"> To make a proper and efficient use the economical resources

(2) Implementation Strategy

The programs tries to strength the environment control actions and improvement of production conditions of farmers. The results foreseen to be reached through the implementation of activities are as follows:

Direct Results	
General	<ul style="list-style-type: none"> Procurement of Cheaper External Resources and Expenses Economy of the State
Public Investments	<ul style="list-style-type: none"> Improvement of the Infrastructures destined to Environmental Education, Monitory System and Demonstrative Fields.
Credit Lines	<ul style="list-style-type: none"> Improvement of the Environment Conditions (reduction of burned and deforested areas and also the reduction of problems caused by agriculture defensive) Enlargement of the forest area Capitalization of farmers through profitable credit lines Increasing of Agricultural Production Increasing of possibilities for the introduction of new technologies aiming the sustainable agriculture.

The basic strategy of the program is to take advantage of the private sector energy, promoting investments of farmers in order to minimize the expenses of the State, completing the necessary actions to reach a sustainable development through the

investment of the public sector.

The capital resources (60% of the Required Capital) shall be obtained from foreign sources, as an environment project, with favorable conditions trying to find a better way to apply the resources in economical and environmental terms and to avoid one more responsibility of the state.

Favorable credits to farmers shall be supplied considering that the basic strategy of the credit is to take advantage of the farmers energy in order to provide an active participation in the growing of production which shall be develop as following;

1. To obtain a very favorable credit
2. To subside the cost referred to the difference of rates, transforming them in cost for the government.
3. The exchange risk shall be assumed by the state in order to reduce the interest rate to be applied and reducing the bank charge in order to make possible the negotiation of this item. (The exchange risk appear after the end of grace period, that means 7 years of delay if there is valorization of the source currency during the amortization period).
4. To formulate an efficient credit system without increasing of the financing cost.

Each Part is composed of the following actions:

PART	Contents
PART A	Financing for Farmers
PART A1 (Preservation of Environment)	<ol style="list-style-type: none"> 1. Control of Fire 2. Support to Extractive Activities 3. Reforesting 4. Forest Managing 5. Recovering of Degraded Pastures 6. Agriculture and Forest System
PART A2 (Vila Verde)	<ol style="list-style-type: none"> 1. Environment recovering of the deteriorated areas 2. Sustainable Agriculture 3. Improvement of the Seeds, Semen and Seedlings distribution systems
PART B	Supply of Good and Services
PART B1 (Construction of Buildings)	<ol style="list-style-type: none"> 1. Environmental Education Center 2. Agriculture-Ecology Center 3. Central Laboratory for Monitory 4. Agriculture-meteorological Stations 5. Demonstrative Field
PART B2 (Supply of Equipment)	<ol style="list-style-type: none"> 1. Environmental Station 2. Educational Center 3. Agricultural-Ecology 4. Monitoring of Fire 5. Central Laboratory for Monitory 6. Agriculture-meteorological Stations 7. Water Resources and Soil 8. Demonstrative Field
PART B3 (Third Services)	<ol style="list-style-type: none"> 1. Environmental Education
PART B4 (Actions of the Government)	<ol style="list-style-type: none"> 1. Environmental Station 2. Educational Center 3. Agricultural-Ecology 4. Monitoring of Fire 5. Central Laboratory for Monitory 6. Agriculture-meteorological Stations 7. Water Resources and Soil 8. Demonstrative Field
PART C	Managing of the Program
PART C1 (Managing of the Program)	<ol style="list-style-type: none"> 1. Managing of the Program

(3) Methodology for Provision of Agricultural Credit

The cooperation of institutions such as RURALTINS, SAG, research institutes, EMBRAPA, UNITINS and the NGOs shall be necessary to implement a credit system that may introduce new technology considering the lack of experience of farmers. The investment models shall be implanted with the support of corresponding institutes in order to reach a higher effect of the implanted program, then the results shall be promoted to obtain future financing.

(4) Cost of the Program

The cost of the program is summarized as follows:

1) Financing (Private Investment)

The Cost of the Financing Program is composed as follows:

1. Value of Financing (90% of the Value required by the farmers)
2. Value of the farmers capital (10% of the Value required by the farmers)
3. Subsidy of the Government for Financing (2,5 % of the Financing Value During the borrower amortization)
4. Responsibility of the Exchange Risk (5% of the Foreign Resource)
5. Administrative Expenses
6. Technical Assistance Expenses (5% of the total Financing Value) 01
7. Others Financing Expenses (It is estimated 1% of the Foreign Source Value)

The capital required for this financing is:

PROGRAM IMPLEMENTATION COST	
Sub-Program	Required Capital (in R\$1,000)
ENVIRONMENT PRESERVATION	
1. Promotion of sustainable forestation	10,000
2. Control for burning off of natural vegetation	10,000
3. Improvement of water quality	10,000
Sub-Total	30,000
GREEN VILLAGE	
1. Environmental Recovering	30,000
2. Promotion of Sustainable Agriculture	70,000
3. Improvement of the Seeds, Seedling and Semen Distributions	10,000
Sub-Total	110,000
TOTAL	140,000
a. Financing	126,000
b. Farmer	14,000
c. Subsidy of Interest (2,5% during 8years; 20%)	25,200
d. Exchange Risk Responsibility (5% of the value)	7,000
e. Administrative Expenses (10% of the Required Capital)	14,000
f. Technical Assistance Expenses(10% of the Required Capital)	14,000
g. Others Financial Expenses (5% of the Required Capital)	7,000
TOTAL	207,200
Foreign Portion	126,000
Local Portion	81,200

2) Public Investment

The cost of the public investments (Part B) are:

Program Implementation Cost			
Sub-Program	Required Capital (R\$1,000)	Foreign Portion	Local Portion
Educational enlightenment and education	4,600	3,700	900
Environmental monitoring system	12,800	8,800	4,000
Demonstration farm	6,700	4,000	2,700
Total	24,100	16,500	7,600

3) Cost of the Program

The cost of the program is estimated as follows:

Program	Required Capital (R\$1,000)	Foreign Portion	Local Portion
Part			
1. Part A (CREDIT)	207,200	126,000	81,200
2. Part B (Supply of Goods)	24,100	16,500	7,600
3. Sub-Total	231,300	142,500	88,800
4. Part C (4% do Item 3)	9,200	5,700	3,500
Total	240,500	148,200	92,300

(6) Methodology for the Investment of Resources (Flow of Capital, etc.)

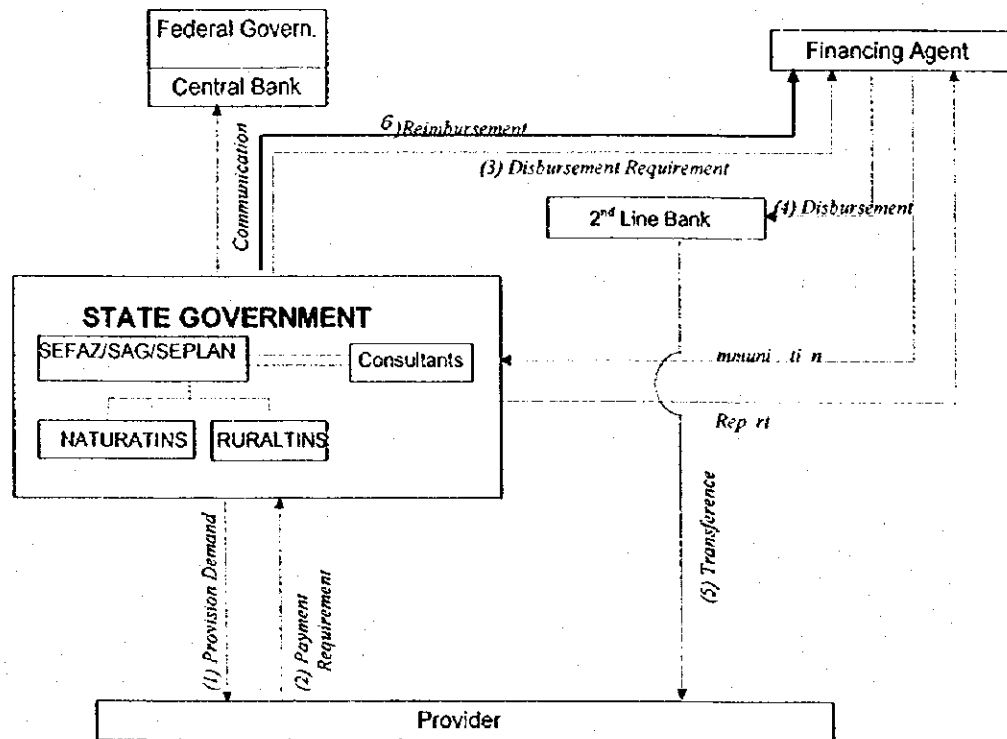
The Program shall be implemented according to the characteristic of each activity. The programs were divided as follows:

Type of Investment	Projects
Public Investment;	<ul style="list-style-type: none"> • Enlightenment of Environmental Education • Establishment of Environment Monitory System • Demonstrative Field
Private Investment;	<ul style="list-style-type: none"> • Promotion for Sustainable Forestation • Control for Burning off of Natural Vegetation • Measures against water pollution • Improvement of the Rural Environment • Production of Seeds, Semen and Seedlings • Sustainable Farming Model

1) Public Investment

The flow of capital for the public investment is as illustrated below.

[Public Investment]



2) Private Investment

The investments of the private sector are promoted through the introduction of credit lines for farmers with lowered interest rate and other favorable conditions that will have positive effect to attract new investors in the State. This investment is also aimed to serve as an impetus for development as well as for environmental conservation.

Financing for farmers are applied in fix and semi-fix investment, using the investments coming from Foreign Sources (approximately 90% of the required capital) and the resources supplied by the farmers (10% approximately), creating a rotary fund. The small farmers who do not have this 10%, may participate supplying man power cost, etc. In addition, in view of the program's consideration in environmental conservation, attention is paid in assessment of applicants to render credit as much as possible, even though their IRR in farm operation plan should be inferior.

3) Methodology for Investment of Resources

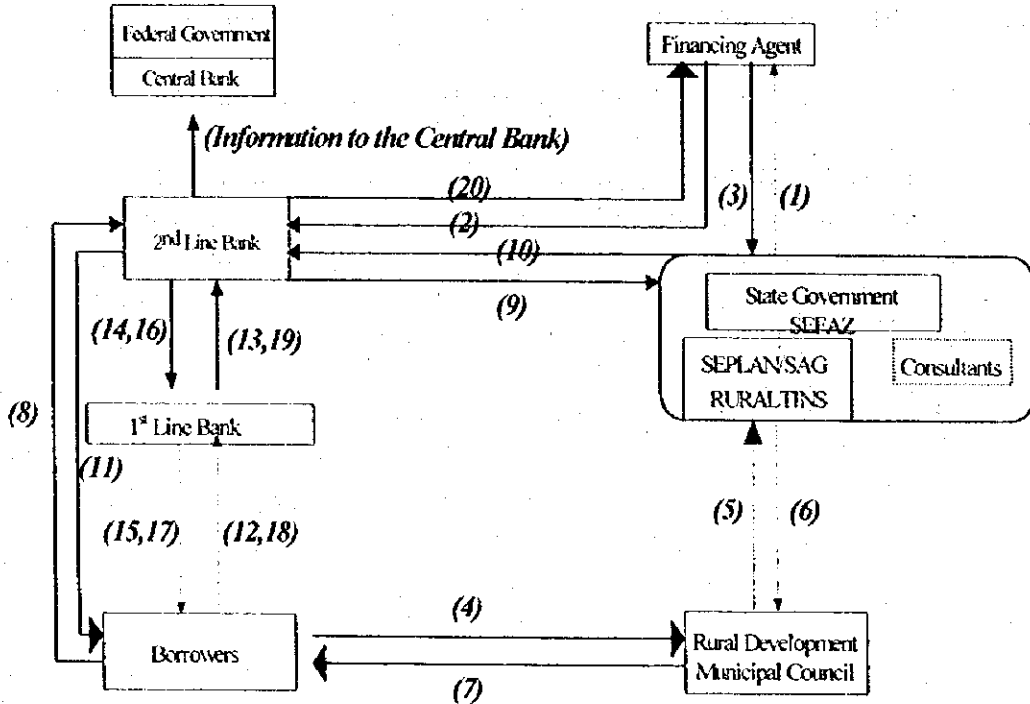
In order to enable consistent and continuous provision of rural credit to farmers a fund shall be established and rural credit provision system shall be established in this fund.

4) Participation of Several Agents in the Implementation of Rural Credit

The participation of the State Government shall be to assume certain financial costs (i.e. exchange risk), subsidy to farmers (differences between the interest rate that may be applied by the banks, without losses and the rate to be applied), the cost of technical assistance to implement the new credit system, etc. Ten (10%) of the required capital shall be proposed to be provide by borrowers in order to complete the participation.

The flow of capital for rural credit line is as drawn in the next page.

[Agricultural Credit]



- (1) Disbursement Requirement
- (2) Disbursement
- (3) Disbursement Communication
- (4) Project Approval Requirement
- (5) Communication of Project Contents for SAG Analysis
- (6) Information about the Analysis Results
- (7) Communication of the Results
- (8) Contract Requirement
- (9) Contract Analysis Requirement
- (10) Communication about the Contract Analysis Results
- (11) Contract
- (12) Credit Requirement
- (13) Transference Requirement
- (14) Funds Transference
- (15) Credit to the Borrower
- (16) Recovery Requirement
- (17) Payment Requirement
- (18) Payment
- (19) Payment Transference
- (20) Reimbursement to the Financing Agent

Note; Only the approved projects will follow the procedures

5.3.2 Environment Conservation Program

This program, which is concerned with promotion for environmental conservation of the State, is composed of the following projects as measures to alleviate deterioration of natural resources.

1. Forest management
2. Control of Burning off
3. Measures against Water Pollution
4. Environmental Education
5. Establishment of Environmental Monitoring System

In implementation of the program, participation of private sector is encouraged so as to facilitate environmental conservation-related projects designed for protection of forests and deceleration for degradation of soil fertility through control for burning off of natural vegetation well as for conservation of natural resources.

Environmental Conservation Program	
Rural Credit	Public Investment
- Promotion for sustainable forestation - Control for burning off natural Vegetation - Mitigation of water contamination	- Environmental education - Establishment of environmental monitoring system

(1) Promotion for Sustainable Forestation

1) Outline of the Project

This project, which contemplates to expand rural credit line to farmers who undertake conservation of forests, consists of the following sub-projects, namely:

1. Forestation and reforestation
2. Vegetation conservation for reservation lot (50% of rural land property)
3. Recovery of soil fertility in degraded land
4. Agro-forestry

The sub-project for forestation aims to expand extension of forests in Tocantins by promoting new plantation of forest, meanwhile the project for reforestation seeks for reservation of valuable seeds existing in the state and to protect native forests. The sub-project No.2 contains a target to improve and to make optimum use of vegetation at reservation area within farmers' property belonging to the Legal Amazonian Region. The sub-project No.3 intends to incorporate green belt lest soil erosion which is associated with degradation of soils at pasture should be progressed. The last sub-

project is to be implemented within the scope of diversification plan of farming activity. All of these projects are directly concerned with conservation of forest existing in the State and they are indirectly aimed to serve to discourage burning off practice undertaken by livestock farmers.

2) Objective of the Project

The State of Tocantins is featured by less use of land for forestry, albeit it is endowed with large extension of land suitable for forestry; in addition, valuable seeds of forest native in Tocantins are vulnerable to disappear. Under such situation, the progress of deforestation is conspicuous. The present project has an objective to enlarge coverage with forest within the State with facilitating access to rural credit for this purpose.

3) Project Rationale

The disordered development in the past has reduced notably the area covered with forests. The primary factors which have brought about this situation is an absence of adequate technical and financial assistance to farmers in association with local population's ignorance on importance of forest resources and they have caused reduction of valuable native forest seeds.

The land area suitable for development of forestry accounts for approximately 230,000 km² in total, of which only limited area is actually used for activity related with forestry. Belonging to the Legal Amazonian Region, rural landholders are obliged to reserve 50% of their land area to reserve it as forest land, but very few of them take appropriate measure for this purpose.

Close to one-third of lands in Tocantins are represented by extensive pasture in which degradation of soils is in progress. It is commonly recognized that one of economical method to mitigate said degradation of soils is to incorporate vegetation with forest in parallel with pasture. Agro-forestry project comprising mixed farming of forestry and crop farming shall be proceeded in comparatively less productive lands as a measure to conserve soils and to maintain land fertility.

4) Contents of the Project

This project envisages to render rural credit to farmers for the following sub-projects.

(Forestation and reforestation)

1. Capital investment for forestation (Land improvement, necessary installations and seedlings) and recurrent cost to be incurred for the initial three years.
2. Capital investment for reforestation (Seedlings and necessary installations)

and recurrent cost to be incurred for the initial three years.

3. Procurement of agricultural machinery and equipment

(Vegetation conservation for reservation lot – 50% of rural land property)

1. Capital investment for reservation lot (Fence, seedling, necessary installations, etc.
2. Procurement of agricultural machinery and equipment

(Recovery of soil fertility in degraded pasture land)

1. Capital investment (Fence, land improvement, seedling, etc.)
2. Procurement of agricultural machinery

(Agro-forestry)

This sub-project intends to provide rural credit to farmers who embark agro-forestry within context of agricultural diversification plan expecting positive effect on conservation of soils.

(2) Control for Burning off of Natural Vegetation

1) Outline of the Project

This project aims to control burning off practice of rural landowners through implementation of the following two sub-projects.

1. Promotion for ordered practice of burning off
2. Encouragement of extrativism activities

2) Objective of the Project

With introduction of ordered burning off practice, this project has an objective to curb sources of fire at mountain area.

3) Project Rationale

The sources of mountain fire consist of flying sparks of disordered burning off to adjacent lands, unnecessary and careless ignition in the field, etc. The most practical and economical measures to reduce mountain area affected by fire shall be enforcement of ordered burning off to farmers and encouragement of extrativism to rural population. Due to the fact that the practice of burning off prevails in the State because farmers do

not have sufficient financial resources to install fire-proof belt alongside fence of pasture, financial assistance with provision of necessary loan to farmers is reasonable.

4) Contents of the Project

This project intends to provide rural credit to the following projects.

(Promotion of ordered practice of burning off)

1. Supply of agricultural machinery for incorporation of fire-proof barriers
2. Supply of machinery for prevention of burning off
3. Supply of machinery for introduction of improved pasture
4. Incorporation of fire-proof barriers

Eligible beneficiaries of this project shall be those who have applied for ordered burning off in the past.

(Encouragement of extrativism activities- collection of babacu and apiculture)

1. Supply of equipment necessary to encourage the extrativism activities
2. Installation of building and equipment necessary for activities

(3) Mitigation of Water Contamination

1) Outline of the project

This project proposes to provide credit to owners of agro-industry and livestock farmers of the State for activity related with treatment of sewage.

2) Objective of the Project

This project has an objective to mitigate deterioration of water with provision of credit to devise against water contamination.

3) Project Rationale

Various type of agro-industry are found in the State without making appropriate treatment of sewage that causes water contamination in various sectors of rivers in Tocantins. Even though agro-industry exercises negative impact on environmental condition of surrounding areas, inhabitants in these areas are not in as position to claim against this deterioration of environment because they are employed in the agro-industry in question. Agro-industry, on the other hand, is not willing to take necessary measures against water contamination giving priority to earning profit of factories. Thus,

this project which contemplates provision of credit with lowered interest seeks for promotion of mitigation works for water contamination.

4) Contents of the Project

Under the present project, provision of credit shall be made to the following project.

1. Installation of water treatment plants and equipment
2. Incorporation of ponds for water treatment, etc.

Proposed beneficiaries of the project shall be owners of agro-industry as well as livestock farmers.

(4) Environmental Enlightenment and Education

1) Outline of the Project

This project consists of the following projects relevant to environmental education and is to be undertaken by the state government as a responsible agency for upgrading effect of investment on environmental sector.

1. Implementation of environmental education program
2. Establishment of environmental education center
3. Establishment of agro-ecological center
4. Implementation of the Agenda-21

2) Objective of the Project

This project aims to enhance consciousness of local population for environmental consideration with consolidation of environmental education-related facilities for implementation of environmental education.

3) Project Rationale

Environmental deterioration often stems from an absence of knowledge and consciousness on environmental issues among local population, so participation of local population in improvement of environmental conditions is essential. Without this participation, impact of projects to be implemented with provision of rural credit would be decreased.

4) Contents of the Project

(Implementation of environmental education program)

The present program contains the following activities.

1. S.O.S. Queimada
2. Environmental education for indigenous people
3. Tree celebration week project
4. Tocantins chelonian project
5. Proper application of agro-chemicals
6. Control of sewage stemmed from livestock activity

(Establishment of Environmental Center)

This sub-project shall comprise the following components.

1. Construction of building containing library, audiovisual room, lecture room., meeting room, dormitory, etc.
2. Procurement of equipment and materials
3. Procurement of vehicle equipped with equipment and materials for diffusion of environmental education.

(Establishment of Agro-ecological Center)

This center is proposed in an attempt to educate and enlighten farmers the importance to conduct farming in harmony with environmental conservation and for this purpose the following components shall be designed.

1. Construction of building containing library, audiovisual room, lecture room., meeting room, dormitory, etc.
2. Procurement of equipment and materials
3. Procurement of vehicle equipped with equipment and materials for diffusion of environmental education.

(Implementation of the Agenda-21)

5) Cost of the Project

The cost required for implementation of the project is estimated as follows.

Projects	Cost (R\$ x 10 ³)		
	Capital	Recurrent (Initial 3 years)	Total (Initial 3 years)
Environmental education	1,200	300	1,500
Environmental education center	1,600	300	1,900
Agro-ecological center	900	300	1,200
Total	3,700	900	4,600

6) Implementation Schedule of the Project

The sub-program is scheduled to be implemented in the following manner.

Projects/Year	98/99	00/01	02/03	04/05	06/07	08/09	10/11	12/13	14/15
Environmental education	- P -	- C -							
Environmental education center		- P -	- C -						
Agro-ecological center		- P -	- C -						

Note: P: Preparatory Period, C: Construction Period, O/M: Operation and Maintenance Period

(5) Environmental Monitoring System

1) Outline of the Project

This project consists of the following projects and is to be undertaken by the state government as a responsible agency for promoting environmental conservation. .

1. Monitoring for Burning off
2. Construction of Laboratory Center (UNITINS)
3. Establishment of Agro-meteorological Observation Network
4. Monitoring for Agriculture, Livestock and Industrial Activities
5. Installation and Maintenance of the NATURALTINS' Regional Center
6. Promotion for Installation of UC

2) Objective of the Project

This project aims to strengthen public sector's role in monitoring environmental conditions of the State so that valuable natural resources should be preserved for future generations.

3) Project Rationale

Monitoring of environmental conditions is an indispensable task for sustainable and rational use of natural resources. Nevertheless, this task is not properly undertaken by the public sector attributable to shortage of necessary equipment, materials and

manpower associated with deficient allocation of budget. Without appropriate precaution in the past, natural resources of the State are vulnerable to distinction, so establishment of environmental monitoring system is an immediate agenda, should the state government seek for preserving them.

4) Contents of the Project

(Monitoring for Practice of Burning off)

1. Implementation of research on burning off
2. Implementation of seminar on control of burning off
3. Publication of research results
4. Procurement of equipment and installation for research laboratory and research activity

(Construction of Laboratory Center - UNITINS)

1. Construction of laboratory center for monitoring
2. Procurement of movable research equipment
3. Publication of research results
4. Implementation of seminar on environmental conservation

(Establishment of Agro-meteorological Observation Network)

1. Establishment of observation station and consolidation of data bank
2. Improvement of research facilities and equipment

(Monitoring for Agriculture, Livestock and Industrial Activities)

1. Monitoring for forest resources
2. Monitoring for land use and water resources
3. Construction of global administration system
4. Maintenance of laboratory facilities
5. Monitoring for environmental application form
6. Evaluation of Environmental Externalities

(Installation and Maintenance of NATURALTINS's Regional Office)

1. Construction of Regional Office
2. Strengthening of supervisory system on environment at regional office

(Promotion of UC)

1. Encouragement of study on promotion of US
2. Implementation of seminar on promotion of UC at regional level

5) Cost of the Project

The cost required for implementation of the project is estimated as follows.

Projects	Cost (RS x 10 ³)		
	Capital	Recurrent (Initial 3 years)	Total (Initial 3 years)
Monitoring for burning off	1,300	1,000	2,300
Laboratory center	1,800	600	2,400
Agro-meteorological network	1,600	800	2,400
Monitoring for industrial activities	2,400	900	3,300
NATURALTINS's regional office	1,700	700	2,400
Promotion of UC			
Total	8,800	4,000	12,800

6) Implementation Schedule of the Project

The project is scheduled to be implemented in the following manner.

Projects/Year	98/99	00/01	02/03	04/05	06/07	08/09	10/11	12/13	14/15
Monitoring for burning off	- P -	- C -				- O/M -			
Laboratory center		- P -	- C -			- O/M -			
Agro-meteorological network		- P -	- C -			- O/M -			
Monitoring for industrial activities		- P -	- C -			- O/M -			
NATURALTINS's regional office		- P -	- C -			- O/M -			
Promotion of UC		- P -	- C -			- O/M -			

Note: P: Preparatory Period, C: Construction Period, O/M: Operation and Maintenance Period