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Cooperation Agency  
(JICA)

*ANNEX XXII*  
**PRELIMINARY STUDY ON THE  
ENVIRONMENTAL IMPACT IN  
THE NORTHERN REGION**

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## ANNEX XXII

# PRELIMINARY STUDY ON THE ENVIRONMENTAL IMPACT OF THE NORTHERN REGION

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## INTRODUCTION

## **INTRODUCTION**

Pacific Consultants International (PCI), the consultancy firm commissioned by the Japanese International Cooperation Agency (Jica) to undertake a Study of the Integrated Development of the Northern Region of Tocantins State with a view to sustainable environmental management, requested Millennium Ltda to provide a preliminary analysis of the environmental impacts that would arise from the plans that have been proposed. This analysis is presented in this document.

In accordance with the terms of the contract, this report presents a preliminary diagnosis of these impacts which was realised after a data collection process involving the judicious use of field studies and data analysis in order to provide a profile of the current situation with regard to environmental impacts.

Once this preliminary environmental diagnosis had been completed, the environmental impacts which might arise as a result of the plans outlined in the Development Study were identified, analysed and compared to impacts which have occurred in similar areas. Finally, having completed this prognosis, the team drew up a list of recommendations which are presented at the end of this report.

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**Chapter 1 – CONTEXT AND CHARACTERISTICS OF THE STUDY**

ANNEX XXII - 3

## 1.1. Context

The proposal by the Tocantins Government, through the State Production Secretariat, for a Study of the Integrated Development of Agriculture and Cattle Ranching in the Northern and Far Northern Regions of Tocantins was taken up by the Japanese International Cooperation Agency (Jica) which, having signed a technical cooperation agreement, is undertaking a study whose timeframe extends to the year 2025. In this context, the Plan for the Integrated Development of Agriculture and Cattle Ranching in the Northern Region of Tocantins (hereinafter referred to as the Plan) which is currently being drawn up, has established target areas, namely the municipalities of Araguaína and Araguatins, and these have been given highest priority among the 38 municipalities studied.

In the selection of these municipalities, indicators of agricultural development and socio-economic factors were analysed, as well as their suitability and appropriateness with regard to each type of model proposed in the Plan's intermediary report.

This Preliminary Environmental Impact Study will serve as an information base to be used in the finalisation of the Plan and thereby assist in the realisation of the goals that have been established for the Northern and Far Northern Regions of Tocantins State, in the municipalities of Araguaína and Araguatins.

The conceptual and methodological focus follows the Terms of Reference presented by the PCI consultancy, which has been contracted by JICA to perform the studies outlined in the cooperation agreement. The study that is presented here has aspects that are similar to an Environmental Impact Assessment (EIA). However, its coverage of the issues is less full than that which would be required under a formal legally binding EIA, due to the fact that the proposal is still at the planning stage and there are still details which need to be finalised.

The study considers the potential for environmental modification inherent in the development plans that are under consideration, as well as the most significant of the environmental impacts that have occurred in similar areas under similar projects.

## 1.2. Objective and Methodology

The Preliminary Environmental Impact Study that is presented in this document seeks to analyse the plans that are being proposed for the municipalities of Araguaína and Araguatins, which are as follows:

- Plan for the Diversification of Agricultural and Ranching Activities;
- Plan for the Production Nucleus;
- Plan for Environmental Conservation.

The Development Plan has the following objectives:

OBJECTIVES	STRATEGIES
Stabilise the regional economy	<ul style="list-style-type: none"><li>✓ Increase grain production.</li><li>✓ Diversification of agricultural and ranching activities.</li><li>✓ Modernisation of agricultural and ranching activities.</li><li>✓ Provide incentives for agro-industries.</li></ul>
Promote sustainable agriculture	<ul style="list-style-type: none"><li>✓ Production in suitable areas.</li><li>✓ Strengthen research into agricultural and ranching activities.</li></ul>
Safeguard the environment	<ul style="list-style-type: none"><li>✓ Natural resource conservation.</li><li>✓ Measures to prevent deterioration of environmental quality.</li></ul>
Structure agricultural and livestock production	<ul style="list-style-type: none"><li>✓ Strengthen agricultural extension systems.</li><li>✓ Improve the infrastructure of agricultural production.</li></ul>

In carrying out this study, an environmental concept was adopted which analyses man's interference in his biogeophysical space and the work was conducted by a multidisciplinary team composed of professionals from a range of fields, each having knowledge of the region being studied.

The methodological schedule followed was as follows:

- collection of secondary data;
- collection of field data;
- analysis of the basic agenda proposed by the commissioning body;
- elaboration of the locational diagnosis of the target municipalities;
- identification, selection and analysis of possible environmental impacts;
- identification and analysis of environmental impacts which have occurred in similar areas;
- proposals for mitigatory measures;
- preparation of the team's final report.

The preparation of the diagnosis was undertaken by collecting secondary data and data from field trips and collating this information after preliminary analysis. Despite the short time period available for the completion of the study, the team members were able to take account of seasonality by drawing on their previous knowledge of the region and coupling this with research into available data.

### **1.3. Principal Related Plans and Programmes Currently In Operation**

#### **1.3.1. Araguatins**

##### **(a) Development of Agricultural and Ranching Activities**

- **The Master Plan for the Integrated Development of Agriculture and Ranching in the State of Tocantins**  
This plan was developed through technical cooperation between Japan (Jica) and the Government of the State of Tocantins acting through the State Production Secretariat (Sepro) in 1997, with a timeframe extending to 2015. The actions outlined in the plan are to be promoted by the State Government and the private sector. The planning process envisaged the Regional Development Programme under which the Northern Region was considered to have high priority.
- **The Dairy Production Programme (*Programa Bacias Leiteiras*)**  
The objective is to promote dairy production by small-scale producers organised into associations, with finance being provided for dairy stock and artificial insemination equipment, tractors and tools, trucks and small-scale milk processing plant. This programme is being implemented by the State Government.
- **National Programme for the Promotion of Family Farming (Pronaf)**  
This is a Federal Government programme which supports the development and improved quality of life of rural workers. The municipality benefits from a number of support actions: infrastructural development (with funding being provided directly to the municipality), financial support for production (directed at rural producers and support institutions), technical assistance, and policies for management and administration.
- **The 3<sup>rd</sup> Nucleus for Agricultural Production (NPA 03)**  
Actions by the State Government directed at strengthening the organisation of rural producers by means of associations. The settlement was established in the municipality with 2.6 ha for fish farming and flood irrigation systems laid out on a further 30 ha.
- **The Credit Cooperative**  
Aims to support rural entrepreneurs by providing credit, at low cost and with minimal bureaucracy, to finance agricultural, ranching and agro-industrial activities. It was established with the support of the State Government and developed by cooperative members.
- **Promotion of associations and cooperatives**  
Survey and registration of associations and support for technical training for producers organised by Sepro.

##### **(b) Industrial Development**

- A privately owned factory for pharmaceutical products – Farmacom – is currently under construction.

##### **(c) Infrastructure**

- In the roadwork sector, a 20.42 km stretch of the TO 010/496 road between Araguatins and Augustinópolis is currently under construction in the municipality.
- In the energy sector, the Programme for Rural Electrification in Tocantins State (Pertins) is being put into action by the State Government.

#### **(d) Social Development**

- The Community Agriculture Project (*Projeto Lavouras Comunitárias*)  
This is a State Government project which distributes rice and maize seeds and chemical fertilisers for soil and foliar applications, thus generating employment and income for families on the outskirts of towns.
- The Green Yard Project (*Projeto Quintal Verde*)  
This began in 1985 and is conducted by Sepro and the Institute for Rural Development in Tocantins State (Ruraltins) every year during the dry season with the objective of promoting vegetable production and the establishment of market gardens, thereby creating green belts around the outskirts of towns, by distributing seeds, chemical inputs and agricultural tools.
- The People's Bank Programme  
A State Government programme that promotes partnerships between firms and inhabitants in local communities by means of the establishment of small enterprises requiring fixed and semi-fixed investments, machinery and equipment, furniture, tools and working capital supported by the Programme of the Divine Holy Spirit (Prodivino).

#### **(e) Environmental Protection**

- The Integrated Environmental Management Programme for the Parrot's Beak (*Bico do Papagaio*) Region (PGAI)  
This is a suite of actions implemented in an integrated manner and based on five sub-components: Ecological Economic Zoning, Environmental Monitoring, Environmental Control, Promotion of Sustainable Natural Resource Management and Institution Building for the Programme's Executive Agencies. Financial resources are provided by the Pilot Programme for the Protection of Tropical Forests in Brazil (PPG7), and the Programme is run by the State Government (Seplan e Naturatins).

### **1.3.2. Araguaína**

#### **(a) Development of Agricultural and Ranching Activities**

- The Plan for the Development of Soya Bean Cultivation in the Northern Region  
This was initiated in 1999 by the State Secretariat for Production. It is experimental and demonstrative in character and its objective is to promote the development of soya bean cultivation. Initially, in partnership with rural landowners and private enterprises, 48 ha in the municipality were devoted to soya bean cultivation with five different varieties being used. This in turn allowed the organisation of a field day to demonstrate and publicise the results and to disseminate soya bean cultivation; the result was an increase to 850 ha planted with soya bean in the 2000/2001 cropping season.
- The Master Plan for the Integrated Development of Agriculture and Ranching in the State of Tocantins  
This plan was developed through technical cooperation between Japan (Jica) and the Government of the State of Tocantins acting through the State Production Secretariat (Sepro) in 1997, with a timeframe extending to 2015. The actions outlined in the plan are to be promoted by the State Government and the private sector. The planning process envisaged the Regional Development Programme under which the Northern Region was considered to have high priority.
- The 1<sup>st</sup> Nucleus for Agricultural Production (NPA 01)  
This was established in 1995 with the settlement of families in the rural area of the municipality and actions by the State Government directed at organising these families into associations. Tractors, agricultural equipment and other benefits were made available by the State Government, and the settlement currently has a central pivot irrigation system which will begin functioning as soon as the tri-phase rural electrification network is operational.
- The Credit Cooperative  
Aims to support rural entrepreneurs by providing credit, at low cost and with minimal bureaucracy, to finance agricultural, ranching and agro-industrial activities. It was established with the support of the State Government and developed by cooperative members.
- Promotion of associations and cooperatives  
Survey and registration of associations and support for technical training for producers organised by Sepro.



- National Programme for the Promotion of Family Farming (Pronaf)  
This is a Federal Government programme which supports the development and improved quality of life of rural workers. The municipality benefits from a number of support actions: infrastructural development (with funding being provided directly to the municipality), financial support for production (directed at rural producers and support institutions), technical assistance, and policies for management and administration. To date, the communities of the NPA 01, and the Rio Preto, Alegre, Novo Horizonte, Araguaminas and Xixebal Settlement Projects have received assistance under this Programme.
- The Dairy Production Programme (*Programa Bacias Leiteiras*)  
The objective is to promote dairy production by small-scale producers organised into associations, with finance being provided for dairy stock and artificial insemination equipment, tractors and tools, trucks and small-scale milk processing plant. This programme is being implemented by the State Government.

### **(b) Industrial Development**

- Processing Industries for Agricultural and Ranching Products  
The Agro-industrial District of Araguaína, with the support of the Municipal Council, has seen the establishment of a number of private enterprises. One of the most significant of these is Frinorte – the second largest frozen meat plant in the State. The District also houses industries engaged in processing heart-of-palm (*palmito do babaçu*), tomato (the Vegetable Production Cooperative - CPV), animal feed and poultry (Agrolândia) and a textile industry is also expected to set up in the District.  
In the Araguaína municipality there is another frozen meat plant, an abattoir and two dairy processing industries (Biana and ASA) producing pasteurised milk, cheese and long life milk.
- The Export Processing Zone (ZPE)  
This was established by the State Government in order to promote regional economic development by means of the production of products for export, with fiscal and foreign exchange incentives. It is situated just off highway BR-153, and its connection to the North-South Railroad via a railway spur is expected in the future. Proposals for a large retail outlet in the same area are also being studied.

### **(c) Infrastructure**

- Transport
  - The North-South Railroad: construction on this railroad should result in a network of 1.466 Km connecting the states of Goiás and Tocantins to the town of Imperatriz (MA), and allowing access to the Port of Itaquí (MA).
  - State Road Network Management Programme:  
The TO-222 road, with a distance of 98 Km  
Section: Araguaína / Filadélfia  
Section: Araguaína / Balneário de Jacuba – two lanes
  - Hydroway Araguaia – Tocantins
- Energy  
Projects under way:
  - Transmission Lines North – South II
  - Pertins – The Rural Electrification Programme of Tocantins

### **(d) Social Development**

- The Community Agriculture Project (*Projeto Lavouras Comunitárias*)  
This is a State Government project which distributes rice and maize seeds and chemical fertilisers for soil and foliar applications, thus generating employment and income for families on the outskirts of towns.
- The Green Yard Project (*Projeto Quintal Verde*)  
This began in 1985 and is conducted by Sepro and the Institute for Rural Development in Tocantins State (Ruraltins) every year during the dry season with the objective of promoting vegetable production and the establishment of market gardens, thereby creating green belts around the outskirts of towns, by distributing seeds, chemical inputs and agricultural tools.

### **(e) Environmental Protection**

- Under the Programme for Integrated Environmental Management (PGAI) an Environmental Protection Area (APA) is due to be established in the basin of the Lontra river.

### **1.4. Technical Characteristics of the Plan for Agricultural and Ranching Development in the Northern Region**

The Plan envisages the implementation of three basic plans: Plan for the Diversification of Agricultural and Ranching Activities, Plan for the Production Nucleus, and Plan for Environmental Conservation, with the objective being to ensure the sustainability of people in their communities. There are certain technical characteristics which permeate all the plans, and others which are specific to each proposal as set out below.

Among the plans' common technical characteristics are those that are directly related to their expected results in environmental, social and economic spheres.

#### **1.4.1. Environmental**

Care for the maintenance of the environment (biotic and abiotic) is a factor that is relevant to all the suggested processes, and this includes attention to the conservation and or regeneration of the soil, water and vegetation for which some techniques are set out below.

##### **(a) Soil conservation**

Soil conservation practices can be implemented by adapting productive systems in appropriate ways including the following measures:

- Conducting agricultural operations along contour lines;
- The construction of terraces or the planting of species which serve to retain/contain water run-off and thereby prevent erosion;
- Soil improvement at both superficial and sub-surface levels so as to facilitate deep rooting systems in plants;
- Making agricultural and ranching activities compatible with the physical, chemical and biological conditions of the soil;
- A gradual reduction in the use of agricultural machinery with an increase in the use of minimal cultivation techniques or direct planting to reduce soil compaction;
- The appropriate use of agricultural machinery and equipment used in production activities;
- Maintaining plant cover so as to avoid leaving the soil bare for long periods;
- Conservation/protection of field tracks by establishing areas where surface run-off can be caught and retained, rather than flowing down these 'tram lines' which can cause significant erosion.

##### **(b) Water conservation**

Water, as an essential element for living things, deserves and has been receiving special attention from all sectors as evidenced by the laws, decrees and directives that regulate its use, the practice of deforestation around aquifers, and conditions imposed on the occupation and use of land.

On the other hand, awareness of the issues surrounding water, coupled with the implementation of certain techniques in the productive system, by effectively reconciling economic and environmental components, actually provide a more efficient solution than one based solely on the enforcement of legislation.

Recommended practice in this context includes:

- The adoption of soil conservation practices, as described above, so as to contribute to water retention and consequently enhance percolation from the surface into the soil, thereby preventing the washing away of soil particles and the sedimentation of aquifers;
- The establishment of rain water collection and storage systems for use in productive activities (water holes, water tanks);
- The installation of mechanisms to control water quality in discharges to water courses (appropriate treatment of all effluents);
- The application of agricultural techniques that enable a lower consumption of water, an example being those irrigation systems which can achieve the same productivity from lower levels of water use;
- The maintenance, at least, of legal reserves and areas of permanent environmental protection as specified by environmental legislation;

- The adequate disposal of agrochemical containers and packaging (the use of soluble packaging, or safe disposal, or their collection and return to the manufacturer after triple washing).

### **(c) Vegetation conservation**

The constant destruction of primary forests (opening up new agricultural frontiers) is a consequence of the need to increase humanity's food supply, however there are degraded areas where productivity is low or sometimes non-existent as they have been subsequently abandoned.

Some technical characteristics which would contribute to a reduction in the pressures on forested areas are listed below:

- Soil conservation practices, since more efficient land use will enable productivity increases without requiring a greater land area;
- Fire should only be used when absolutely necessary, and it should be used in a controlled manner observing certain minimum precautions (burning in the times when temperatures are milder, construction of fire breaks, warning other people in the neighbourhood, and starting the fire so that it burns into the wind rather than down wind);
- The use of alternatives to fire in the management of cerrados (savannah lands) for pastures and when clearing these same pastures, since once fire gets out of control it can damage vast areas of forest;
- The maintenance, at least, of legal reserves and areas of permanent environmental protection as specified in the Forest Code;
- Forest management and agroforestry systems.

It can be noted that, apart from contributing to the maintenance or improvement of environmental conditions, such measures will also bring economic benefits to the whole community.

### **1.4.2. Social**

The growth of the economically active population and the fact that this has not been accompanied by an increase in employment opportunities has given rise to social concerns from the perspective of both the public and the private sectors. In this context, the plans hold potential to address these concerns as they could enable:

- An increase in the employment of the workforce (job creation) within the areas where the plans will operate, and possibly leading to an enhancement in the skills of the workforce;
- Opportunity for people to remain in the rural environment (a reduction in the rural exodus), so that they no longer need to migrate to urban areas where they tend inevitably to become part of the peripheral population resulting in an increase in the social and financial burden borne by the government and society as a whole;
- Improvements in living standards for community members.

### **1.4.3. Economic**

The establishment of plans which aim to increase production/productivity, and the consequent income generation, will certainly have a positive effect, directly or indirectly, on the economy of the community, municipality or State. The models that have been specified could support:

- An increase in the income obtained by the various actors in the process: for the employee through the creation of his/her job opportunity; for the producer through the increase in production/productivity and the rationalisation of costs;
- An increased circulation of financial resources in the region covered by the plans;
- An increase in commerce and consequently in tax incomes due to the increased circulation of goods;
- An improved standard of living for citizens.

## **1.5. Specific Technical Characteristics**

The differences between the plans presented can be noted in their targeted public, their methodology, in the instruments and means needed for their implantation and in the ends which they are designed to achieve.

### **(a) Plan for the Diversification of Agricultural and Ranching Activities**

#### **"Integrated Production System"**

- Objectives: basically to increase agricultural and ranching production through the recuperation of degraded lands through the establishment of agricultural activities followed by cattle ranching.
- Methods: the implementation of the plan requires an upgrading of existing production systems, involving machinery and equipment to which ranchers do not usually have access (medium/large tractors, drills/planters, harrows, harvesters and others). Alternatives such as partnership production or leasing agreements will be presented, and these may prove interesting provided that both parties stand to benefit from the arrangement. In parallel to this, local infrastructure will also need attention since drying and storage facilities will be required in addition to a fully functional

road network. Soil conditions (topography and fertility) are crucial factors in determining the success of agricultural and ranching activities.

➤ Target public: rural producers, principally extensive cattle ranchers and those who hold degraded areas (pasture or other vegetation) which are relatively extensive.

### **(b) Plan for the Production Nucleus**

#### **“Collective Production System”**

➤ Objectives: this plan is based on the organisation of small-scale producers so that, by acting collectively, they can strengthen their positions in economic and social terms.

➤ Methods: institutional support for initial organisation and the strengthening of existing organisations (associations, cooperatives) and their management by means of a range of methods (technical training courses, management courses, visits to other successful organisations, receipt of financial resources at subsidised cost, etc.). These activities will be developed collectively, using shared instruments (machinery, equipment, etc.) in order to reduce the required levels of investment. Above all, the activities must be adequately planned so that their resulting products are of suitable quality and competitive in the market.

➤ Target public: small-scale producers and their families who are on low incomes and who hold only small parcels of land.

### **(c) Plan for Environmental Conservation**

#### **“System for the Replacement of Forest Losses”**

➤ Objectives: expansion of the forested area, so that properties obtain indices of vegetation cover higher than those legally established for the region while also achieving an increase in rural incomes.

➤ Methods: incorporation of agroforestry and pastoral forestry systems, silviculture, management of conservation areas for agroforestry, pastoral forestry and reforestation activities. The complexity of this plan, allied to the long pay-back period, makes a very significant initial incentive necessary, since to date there have been no comparable activities in the State that would demonstrate its viability.

➤ Target public: rural producers.