

THE CONCERN OF PUBLIC POLICIES ABOUT THE SUSTAINABILITY OF FOREST RESOURCES IN THE STATE OF RONDONIA¹

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ABSTRACT

The objective of this paper is to analyze environmental issues in the public policies which were adopted to develop the state of Rondonia. Using the concepts of sustainability and sustainable development as well as the Ecological Economy proposals, we verified that, until 1986, public federal policies that were adopted for the development of the state of Rondonia showed little concern about environmental issues. In the late of the 80's, that concern became more explicit, specially in state policies. However, its results in relation to forest resource conservation have been little. In long term, the unsustainable use of forest resources prevents the continuation of industrial activities based on wood.

Key words: State of Rondonia, Public Policies, Sustainability, Forest Resources.

1. Introduction

Since the 70's, the state of Rondonia, as well as all the others within the Amazon Basin, has suffered a great increase in its population and has developed certain activities, such as wood extraction and industrial processing, which have had so far great relevance in the regional economy. These phenomena were largely brought forth by the public policies adopted to stimulate the economy in that area. Along the years, these policies have

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altered their concepts of the environmental conservation.

The objective of this paper is to verify how the issue of forest resource use sustainability was considered in the federal and state plans and policies directed to the development of the state of Rondonia. Most specially, we are interested in analyzing how those programs affected the industrial sector of wood in the State of Rondonia, which represents an expressive share of its economic activity.

In relation to the current literature about Rondonia's economy, this paper adds the analysis of state policies that have been implemented since the end of the 80's and evaluates how forest resource destruction strikes the wood industrial sector in state of Rondonia.

The wood industrial sector in the state of Rondonia is basically made up of firms that process wood mechanically and furniture manufacturers. In 1987, that sector answered for 51.6% of the industrial firms in state of Rondonia. In 1997, that share dropped to 31.2% (FIERO, 1997). However, that sector continues to hold an expressive share of industrial gross product of the state.

This paper is composed of five sections, including this introduction. The second section has the theoretical framework, where the relationships between the sustainability concept and sustainable development are presented, and the economic instruments proposed by Ecological Economy for the development of certain areas are discussed. In the third section, public policies concerning Rondonia's occupation are analyzed and the way the sustainability of the use of forest resources was addressed is evaluated. In the fourth section, the evolution of wood industrial sector in Rondonia is evaluated, evidencing how the exhaustion of the forest resources has affected that sector. In the last section, the conclusions of the paper are presented.

2. Theoretical framework about Sustainable Development and Sustainability

Initially, the concepts and relationships between sustainability and

sustainable development are discussed (item 2.1). After that, the way that these situations can be reached according to the authors that form the Ecological Economy is verified (item 2.2).

2.1. Sustainability and Sustainable Development

In general, sustainability is seen as the possibility of **continuity** of similar or superior life conditions for a group of people and their successors in a given ecosystem. The sustainability concept is equivalent to the idea of permanence of the life system, expressing the behavior that attempts to follow the laws of nature. Therefore, it is about recognizing what is biologically and physically possible in the long term (Cavalcanti, 1995b, p. 165).

Thus, sustainability can be defined as an amount of consumption that is indefinitely extended without wearing out the stocks of natural capital. For example, in any business, the capital stock involves long term assets, as machines and buildings that are used like production factors. The natural capital is the soil and atmosphere structures, the biomass of plants, animals, etc. They all compose the base of all ecosystems. That sort of capital makes use of primary inputs to generate the services of the ecosystem and the flows of natural physical resources. Examples of natural capitals are forests, fish populations and oil deposits. The flows of products coming from the mentioned natural capitals are logs, captured fish and pumped raw oil, respectively. We can conclude that the limiting factor to the development is not the capital created by men, but the remaining natural capital. In other words, remaining forests limit the wood production rather than the capacity of sawmills; fishing is restricted by the fish populations and not by fishing ships; and the raw oil is limited by its deposits and not by perforation and pumping capacities (Costanza, 1994).

Sustainability does not mean static or stagnant economy. Nevertheless, attention should be paid to the distinction between **growth** and **development**. The first, which is an increase in quantity, does not

have possibility of being indefinitely sustainable in a finite world. The latter, which is a lifestyle improvement without necessarily generating an increase in the amount of the consumed resources, can be sustainable. According to several authors, no concern about sustainability of life permanency in current economic systems or about the economy that depends on that permanence can be verified (Costanza, 1994, p. 121).

According to the “Our Common Future” report, sustainable development is the one that affords the current needs of the population without limiting the possibilities of consumption of the future generations.

When we refer to sustainable development, we need to take into count both material and economic aspects, and a multidimensional and multifaceted group that composes the development phenomenon, with its political, social, cultural and physical aspects. The sustainability of the whole should be only supported by the simultaneous sustainability of its parts (Stahel, 1995, p.108).

There is neither a unique sustainability model for a given economy nor only one way of reaching a sustainable life or only one theory of ecologically balanced development. In reality, there is a multiplicity of methods to understand and investigate such matter (Cavalcanti, 1995a, p.21).

Sustainability and sustainable development are different. The first is a difficult objective and takes a long time to be reached; and, the latter is a variable process of changes in order to get sustainability of a given system (Dovers, 1995).

The adoption of the sustainable development concept by the developing countries generates the opportunity to reconcile the objectives of economic growth, social issues and protection of the environment. What is intended is the conciliation of growth and environmental quality and not the deceleration of the first (Kitamura, 1994, p. 19).

In the case of Amazon basin, three divergent conceptions of sustainable development are identified in the literature. In the first, sustainable development is based on mechanisms that conserve the

environment and motivate the participation of local communities, mainly the small producers, by several programs of land use. In the second, this kind of development requires the natural capital stocks to be constant, with the objective of supporting future generations. In this case, the use of that area for agricultural purposes is not allowed. The third concept is based on ecodevelopment, which suggests the use of the biomass as generator of sustainable development. The objective of the latter is to motivate the partial substitution of the forest, not burning it down, by rational plantations and the rational use of that share of the forest to get several species of products through local processing (Becker, 1993).

2.2. The Proposals of the Ecological Economy

The analysis of the relationship among economy, society and environment is focused by several currents of the economic thought (according to Sekiguchi & Pires, 1995). Among them, the so-called ecological economy stands out. It is based on a more preventive approach against existing environmental catastrophes, defending the conservation of the natural resources through a belief that will appropriately take in consideration the potential needs of future generations. According to that approach, growth is limited by the shortage of natural resources, not being able to be overcome only through technological progress.

For Ecological Economy, successful public policies are those which reconcile economic growth and environmental preservation, stimulating the orderly use of natural resources, with the objective of making at least the same amount of these resources available to the future populations. In that way, those policies reach to a sustainable development. But, they should be preceded by environmental policies which would support social needs and environmental protection. That policy should be based on technical and economic instruments as well as on regulations that lessen the disagreements between the interest of agents of the State and the civil society. Ecological economy proposes two of those instruments, which are the environmental management and the economic-ecological zoning.

Environmental management is a mechanism whose primordial function is the administration of the natural resources, trying to find the best alternatives for the possible problems that appear when one is managing such resources, mainly when conflicts of interest arrive.

The most important objectives of environmental management are to discipline the use of the natural resources and to control the environmental quality. In general, the management of a system assures its good operation and best revenue, as well as its continuity and development. Historically, this concept was created in the private domain, referring to the administration of the goods possessed by an owner (Godard, 1997, p. 209).

In order to administer a certain resource, there is the need of delimiting areas, which are obtained by the economic-ecological zoning, which is an instrument of space management. The zoning has as objective to do a study of a certain area. Then, an ordination that would reflect more the physical and socioeconomic characteristics of the territory can be obtained. The aim of that instrument is the insertion of the environmental dimension in the planning, serving as an instrument for a planned occupation of the space, besides giving elements for a better management of the activities.

The economic-ecological zoning³ offers technical-scientific aid for the execution of territorial ordering plans. The base of the latter is the division of the geographical space into subspaces or intervention zones, in accordance to its internal contrasts and similarities, concerning its ecological and socio-economic attributes (CIMA, 1991).

The results of structure and dynamic studies of those areas provide the necessary elements to determine the objectives, to choose criteria, norms and standards for the planning of interventions. In order to reach those goals, the implementing of the ecological-economic zoning demands a methodology that is in agreement with the complexity and inclusion of

³ In Brazil, it was legally determined by the Constitution, and the regulations of Law 6938 and Decree 99,540/90, which implemented the Coordinating Committee of the ecological-economical zoning of the National Territory.

the themes involved in the definition of sustainability, which is a crucial factor for the appropriation of those areas.

Currently, this zoning type is based on the need of determining and marking at least three areas regarding its intervention category. They are: **production areas**, which enable productivity both at commercial and at subsistence levels, through the appropriate use of natural resources and considering the improvement of the quality of life for the populations that reside in the area, besides the conservation of the environment; **unadvised-for-short-term-productive-use areas**, which have limitations regarding their uses, needing handling techniques; and **special areas**, which comprehend Conservation Units with indirect use, permanent preservation areas, Indian reservation areas and important historical, cultural and natural sites (CIMA, 1991).

3. Public Policies Concerning the Development of the State of Rondonia

Considering the sustainability concepts and sustainable development and the proposals of the Ecological Economy, the public federal and state policies implemented to stimulate the Rondonia's economy are analyzed. It is attempted to verify how these policies affected the forest resources of the state of Rondonia.

3.1. The Amazon Basin and Actual state of Rondonia

In Brazil, with the objective of coordinating the government plans for the Amazon Basin, the Superintendency for the Amazonia's Economic Valorization Plan (SPVEA) was implanted in 1953, during the Getúlio Vargas's second government. In 1966, that organ was substituted by the Superintendency for the Development of Amazonia (SUDAM) and it, for effects of governmental action, delimited Legal Amazonia. Rondonia is a part of that area.

In the second half of the 60's, more specifically during Castelo

Branco's Government, two of the primordial goals were the solution of the existing "social tensions" in the Northeast and South of the Country, concerning land conflicts, and the development of Amazon Region. Both could be solved through the integration of Amazon Region with the rest of the Country. So, some policies were instituted with the objective of facilitating the granting of land to a great populational contingent in Amazon Region and to favor certain types of economic activities.

The projects included, among other things, an ambitious program for the construction of highways that would link Amazon Region to the Northeastern and South areas of the country, plans for its agricultural settlement and fiscal incentives that benefited the creation of new agricultural and industrial activities.

With an area of 243 thousand km² and located in the southwest of Brazilian Amazon Region, the State of Rondonia suffered great economic, social and environmental impacts with the implantation of regional development programs. The end of the construction of the Cuiabá-Porto Velho highway (BR-364) and its posterior paving in the ambit of POLONOROESTE were of great importance for migratory flow towards this State. The migrants were attracted by Rondonia's economic potential, such as unexploited lands available for agriculture, cattle raising, wood exploration, rubber extractive exploration, and minerals extraction, such as gold and tin.

Before that time, the exploitation of the forest by the local population - by means of hunting, fishing and harvesting the vegetable products - was for subsistence purposes, and it did not alter the forest environment significantly; and, the itinerant crop was insignificant.

In Table 1, the evolution of Rondonia's populational growth is observed. In 1960, the total population of this State was of 69,792 inhabitants, jumping to 1,231,007 inhabitants in 1996. The demographic density increased from 0.29 inhabitants/ km² in 1960 to 5.07 inhabitants/ km² in 1996.

Table 1 – Populational evolution of the State of Rondonia from 1950 to 1996, according to their domiciles

Year	1950		1960		1970	
	Pop	%	Pop	%	Pop	%
Urban area	13,816	37.4	30,186	43.2	59,564	53.6
Rural area	23,119	62.6	39,606	56.8	51,500	46.4
Total	36,935	100	69,792	100	111,064	100

cont.

Year	1980		1991		1996	
	Pop	%	Pop	%	Pop	%
Urban area	228,168	46.4	658,172	58.2	762,864	61.97
Rural area	262,857	53.6	472,702	41.8	468,143	38.03
Total	491,025	100	1,130,874	100	1,231,007	100

Source: SEDAM (1996) and FIBGE (1996).

The annual geometric population growth rates in the periods 1950/1960, 1960/1970, 1970/1980, 1980/1991 and 1991/1996 were, respectively: 6.57%, 4.76%, 16.03%, 7.88%, and 1.71%. Therefore, it is verified that the years of largest population growth were in the 70's and 80's, what coincides with the expansion of highways and official and private projects of settlement in the state.

3.2. Migration Process and its Impact on the Native Forests

The intense migratory flow verified in the State of Rondonia since 1970 can be justified both by expulsion factors and by attraction factors. In the case of attraction factors, the end of the construction of BR-364, which has relatively fertile soil at certain points, and the possibility of being granted 100-hectare lots of land with basic services and the necessary infrastructure at low prices in the several settlement projects stand out. Regarding expulsion factors, the most important factor is related to the lack job opportunities observed in the South and Southeast of Brazil, due to the diffusion of mechanized systems in soy production, the intense frosts in coffee plantations; and, due to the fragmentation of land properties

(Mahar, 1990).

With the objective of granting land to migrants, the Federal Government, during the 70's, created the Integrated Projects of Settlement (PIC), aimed at landless with low income. However, official organs could not assist the settlers' demand for lots, generating conflicts in the areas of the settlement projects.

The accelerated demographic growth and the uncontrolled settlement caused harmful effects in the rainforest, with an expressive increase of deforestation. In Table 2, we can verify that, up to the mid-seventies, the deforestation was still small in the State. As the demographic growth and the economic activities increased, there was a simultaneous increase in deforestation.

Table 2 – Average deforested area in the State of Rondonia

Period	Up to 1975	1975 to 1978	1978 to 1980	1980 to 1988	1988 to 1989	1989 to 1990
Area	2.6	988	1,698	2,802.5	1,800	1,700

cont.

Period	1990 to 1991	1991 to 1992	1992 to 1994	1994 to 1995	1995 to 1996	1996 to 1997
Area	1,100	2,265	2,595	4,097	2,496	1,881

Source: MELLO *et alii* (2000, p. 61)

However, deforestation was not homogeneous into the state of Rondonia. In certain areas of that state, deforestation reached high levels. The town of Cacoal, which has a surface of 80,000 hectares, had, in the year of 1975, 2,150 hectares of deforested area. Three years later, the total deforestation was around of 66,950 hectares, that is, 84% of the surface of the town (Mahar, 1990). Great part of the deforestation was due to the pressures to establish new areas for crops in the areas of the government's projects of settlement along the main roads.

The settlement projects were not concerned about guaranteeing the sustainability of the forest resource, in spite of the effective federal forest

legislation that demanded at that time at least 50% of the property were maintained as Legal Reservation⁴ (area where the shallow cut of the forest is prohibited).

In general, more than 50% of the property was deforested. The inefficiency of responsible public organs regarding the environmental issues, when executing effective policies of deforestation control was one of the most relevant reasons behind the non-maintenance of the legal reservation. One of the aspects that should be pointed out is the existing conflict between the forest legislation and other legislation types. For example, whereas forest legislation prohibited deforestation in more than 50% of each property, the 1964's Statute of the Earth "motivated" the deforestation as one of the ways of obtaining the right of ownership of the land.

Actually, what is verified is that the immediate economic value of the forest is considered as being lower than the value of alternative uses of the soil. This point was sustained besides by the inadequate fiscal mechanisms, such as the Rural Territorial Tax, whose value was larger for forest areas, since the deforestation was considered a benefit incorporated to the land. That incoherence is being modified, mainly by Federal Law 6393/97. However, INCRA'S legislation for the implantation of settlement projects, which leads to deforestation practices with improvement purposes, is still maintained.

3.3. POLONOROESTE

In the early of 80's, the Federal Government, afraid of the existing form of occupation in Northwestern of Brazil (Rondonia and parts of Mato Grosso), which is comprised of an area of 410,000 km², and considering the state governments' reduced capacity to deal with ordering needs and socioeconomic aid of the populations who arrived in this area, implemented POLONOROESTE (on May 25, 1981). This program was

⁴ Nowadays, that limit is 80% in farms that have predominantly forests (Medida Provisória 1,511-13, June 25, 1997).

partially supported by the World Bank, having as main objectives: 1) the obtainment of a larger national integration, through the paving of BR-364 between Cuiabá and Porto Velho; 2) favoring the appropriate occupation of the area that was part of the program; 3) sheltering economically unprivileged populations from other areas; 4) getting a significant increase in the production of the area and in the income of its population; 5) helping in the lessening of development inequalities at inter and intra-regional levels; and, 6) facilitating the growth of the production in harmony with concerns about the preservation of the ecological system and about the protection to the Indian communities (SEPLAN-RO, 1990a).

In the period of validity of POLONOROESTE, especially as a consequence of the conclusion of the paving of BR-364 in September, 1984, a new migratory flow came to the state and it caused the amplification of new activities that had been behaving timidly before. The prominence was attributed to the industrial sector of wood. In 1973, the State of Rondonia had approximately 32 sawmills⁵ and, in 1982, they were 387. In the end of the 80s, the number of sawmills in the state was around 1,200 (Lisboa, 1990; UFRRJ/IBDF, 1983).

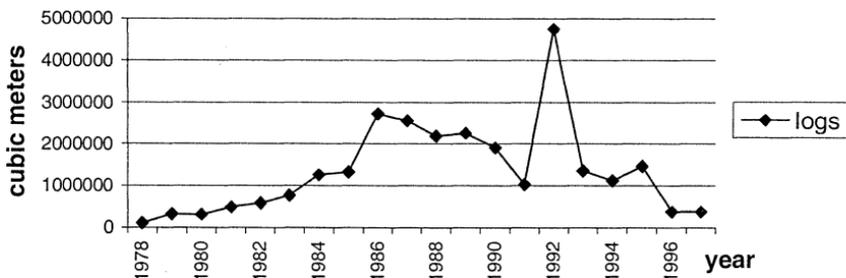
Another aspect that should be pointed out is the expressive increase in the production of logs in the State of Rondonia until the early of the 90's. That production rose from 318,109 m³, in 1979, to 4,744,907 m³, in 1992. In the following years there was expressive decreases, when compared to the production of 1992 (see Figure 1).

Besides the expansion of roads, other factors that are behind these increments in the production of logs are the direct economic incentives granted by SUDAM, which are aimed, most of the time, to the wood export, specially mahogany; and the wearing out of forest resources in the South, which, in 1979, participated with 42.37% of the national production, falling to 7.06%, in 1995. In the North, the inverse process is observed. In 1979, that area accounted for 26.63% of the national

⁵ According to Freitas & Soares (1994, p. 80), this sector was one of the ones which were most benefitted by POLONOROESTE, due to the expansion of the number of roads in the period of validity of this program and to the large availability of workmen, such as workers in settlement projects.

production of native logs, increasing to 76.03% in 1995 (according to the information of the Statistical Yearbook of Brazil, 1997).

Figure 1 - Production of native logs in state of Rondonia - from 1978 to 1997



Source: IBGE - Statistical Yearbook of Brazil and homepage of IBGE.

In terms of the results of POLONOROESTE, it is verified that from 1982 to 1985 it presented considerable actions regarding investment projects. However, in terms of proposals for a compatible social and ecological development, both the Federal Government's and the State's (the last was created in 1982) performances did not meet the expectations and did not reach the goal proposed in the program. The vindication were centralized in the lack of employees and/or not enough technical qualification to reach such objectives. Example given was the former IBDF, which tried to control deforestation and to check conservation units with only eight officers in the whole state (SEPLAN-RO, 1990b). The total deforested area in the state was 13,955 km² in 1982, rising to 27,658 km² in 1985 (Diegues, 1993). The data in Table 2 indicate that from 1980 to 1988, where POLONOROESTE took place, happened one of the largest annual rates of deforestation in Rondonia.

Therefore, we can notice that in POLONOROESTE there was no environmental concern included in the decision made about research, credit distribution and rural extension, which would give support to the

development and a better use of the natural resources.

3.4. Economic-Ecological Zoning Program for Legal Amazonia

Some of the objectives of SUDAM, in 1975, for Legal Amazon Region were doing the territorial zoning, planning the rational exploration of the forest, adopting preservation measures, and intensifying forest research. However, those measures were not put into practice due to the lack of political decisions. Fifteen years later, it was concluded that the zoning of the amazon geographical space in order to implement - or not - several productive activities was very important. In reality, the incentives of *SUDAM* to the lumber activity was more directed to the promotion of the wood extraction, not having the appropriate concern about the liberation of resources that which would promote the sustainability of the activity in the long term.

One way of obtaining the sustainable development of Amazon Region is through the planning of environment use, in order to combine its natural potential with the needs of the regional population. This kind of planning is, usually, based on a zoning which would better determine the location of the activities (Pandolfo, 1995, p.106; Uhl & Vieira, 1991, p.115; Kitamura, 1995, p. 134).

In 1991, the Federal Government implanted, for Legal Amazon Region, the Program of Economic-ecological Zoning. However, the program is not precise because it expresses an ambiguous view of the zoning concept. On one hand, the Economic-ecological zoning is understood as a mechanism of transformation of Amazon Region in an untouchable area, and the other hand areas are liberated for the predatory use (Encontro de Pesquisadores da Amazônia, 1996, p: 5).

The State of Rondonia was the only one belonging to Legal Amazon Region that possessed, in the early of 90's, a socio-economic-ecological Zoning. This zoning could be obtained by the creation of the Agricultural and Forest Plan of Rondonia (PLANAFLORO).

3.5. Agricultural and Forest plan of Rondonia (PLANAFLORO)

In order to obtain an organization of the occupation according to more sustainable approaches, in 1986, the State Government was concerned about correcting some points of POLONOROESTE, by means of the incorporation of territorial ordering idea, in a view of long term sustainability (following a view of the Ecological Economy, as explained in item 2.2). With the creation of the Agricultural and Forest Plan of Rondonia (PLANAFLORO), the first step to the social-economic-environmental Zoning of the state was taken.

Originally, PLANAFLORO was a proposal with the objective of modifying failures in POLONOROESTE's conceptions, operation, institutional responsibilities and execution. Politically, PLANAFLORO is a plan that assists the State Government's solicitations in substituting POLONOROESTE, which was in closing process when the first was proposed.

In practice, PLANAFLORO has as objective the search of the balance between the development and the preservation of the environment. That Plan was established in June of 1988, but it was only implanted in December, 1991. According to the zoning, the territorial division was done in six zones, with the following destinations: zone for intense agricultural exploration (6,195,000 ha.), zone of collective small producers (3,015,000 ha), riverside zone (579,000 ha.), extraction zone (3,500,000 ha.), forest handling zone (3,601,000 ha.) and conservation and preservation zone (7,404,000 ha), according to information from the Encontro de Pesquisadores da Amazônia (1996), Diegues (1993) and FIERO (1995).

PLANAFLORO's proposals are based on the strategy of altering public policies which did not give priorities to the environmental issues, but were effective in the state at the time. The main proposals are:

“Implementing a set of changes in policies, legislation and in programs of public investments, creating a structure of incentives that is coherent with the sustainable development in Rondonia;

preserving the biodiversity of the state, whereas generating the base for the use of the natural resources for the direct economic benefit of the local population; protecting the limits of the Conservation Units, Indian Reservations, Public Forests and Extraction reservations, stopping and preventing illegal deforestation, illegal transport of logs and burning the forests down; creating an intensive integrated system of production in areas that can be used for permanent agriculture and for agroforest, and a system for sustainable handling of the forest and the extraction of non-wood forest products, in other areas that will have to be under the covering of natural forest; helping priority investments in socio-economic infrastructure and in the services that are necessary to the execution of the zoning, in areas which are already deforested and occupied; assuring the technical and operational capacity of the institutions of the state, especially the ones in charge of agriculture and forest support services, and the protection and the forest handling of federal and state Conservation Units and Indian Reservations” (Cury, 1996, p.14).

The zoning and the sustainable forest handling are noted to be essential conditions for the sustainable development, and are present in PLANAFLORO’s proposals.

Regarding the results achieved by PLANAFLORO until the year of 1996, it is observed that the most significant ones are observed in environmental issues - unlike what was verified in POLONOROESTE - standing out the following ones:

“Regulation and creation of Conservation Units and Extraction Reservations; accomplishment of the Second Zoning Approach, review of the instruments of public policies; personnel’s training on the Geographical Information System (S.I.G.) and space management; validation of agroforest systems and alternative systems for the production by the Community Initiatives Project (PIC), now Program of Support to the Community Initiatives (PAICs); searching for sustainable economic alternatives to the Indian populations; implantation of a system of indirect use Conservation Units; technicians’ training in several areas; implantation of environmental education programs, but not

formal” (FIERO, 1997, p. 73).

Despite the results obtained with PLANAFLORO, there are still some problems to be solved, which obstruct certain goals from being reached. They are brought about in dispossession processes of farms, in the implementation of new settlement projects, in the alienation of public land and in the land regularization. Those problems happened because of:

“ignorance of the existence of State Conservation Units and non obedience to the restrictions defined in the socio-economic-ecological zoning; destinations of areas for small farmers to be settled in low-agricultural-yield-soil regions; acceptance of the deforestation, associated to the introduction of artificial pasture as a form of obtaining the ownership recognition, even in areas of restricted use (zones 4, 5 and 6) and in state Conservation Units. That procedure is due to INCRA’s normative action, which, applicable to Rondonia’s case, promotes environmental degradation and disrespect what was established in the Forest Law Code” (Ribas, 1997, p.34).

In order to avoid those disagreements between INCRA’s objectives and the proposals of PLANAFLORO, an agreement between INCRA and the Government of the State was signed in mid-1995, which stated the importance in following the socio-economic-ecological zoning guidelines. The previous elaboration of Studies of Environmental Impact (EIA) was also proposed and studies about agro-forest viability as basic conditions for the implantation of new settlement projects for INCRA.

In the agreement, a work plan was defined, giving emphasis to the following measures: transfers of federal public lands from the Union to the State, with the objective of creating Conservation Units, and evaluating zones 1 and 2 of the socio-economic-ecological zoning with the objective of checking large unproductive farms. They could become part of the public patrimony for land reform purposes.

The proposals of the agreement were not put into practice and the implementation of settlement projects was performed regardless of the State organ guidelines. Another fact that should be stood out is the existence

of Normative Instruction number 3, dated September 8th, 1992, which accepts the deforestation when linked to the introduction of artificial pastures as a way of obtaining of the ownership of the land.

Besides, other point that involves the issue of sustainability of the wood industrial sector more directly concerns environmental licensing.

In a general way, the licensing is an authorization granted to the implantation of a determined activity. The license, when granted, must be in accordance to the environmental zoning of the area and must consider the permanence of the quality standards for the receiving environment of the effluents or emissions of the installation (water, air and soil).

In the State of Rondonia, IBAMA and SEDAM are in charge of the authorization concession and licensing of actions which would potentially bring damages to the environment. The division of the tasks among two different organs generates conflicts in the actions. That is, the licenses of IBAMA are sometimes not in agreement with what is stated in the state legislation of socio-economic-ecological zoning, present in the Complementary Law 52, dated 12/20/91. Besides, the presence of Conservation Units is also disregarded in IBAMA's licenses.

To avoid those conflicts, IBAMA worked together with SEDAM, by means of agreements, with the objective of decentralizing certain licensing functions. The protection responsibility and environmental checking is divided among IBAMA, SEDAM and the Forest Police Service, having also a possibility of participation and of the civil society and city governments.

The low incidences of technical and human resources make deforestation and forest exploration licensing policies quite faulty, what generates many times a licensing that does not correspond to the determination in the zoning.

According to Ribas (1997), there are documented cases of deforest authorization and wood exploration, liberated by IBAMA and SEDAM, in Extraction Reservation areas, besides other Conservation Units, which were created by decree.

The deficiency in the inspection and accompaniment of the licenses for selective exploration, forest handling and forest replacement, besides the flaw in the control in the granting of authorizations for the transport of Forest Products motivate illegal cutting in Indian Reservations and in other Conservation Units.

In addition, the demand for environmental impact studies has not been conducted in all the areas defined in the legislation, with special attention to the programs of land settlement and the implantation of infrastructure.

If, on the one hand, the public organs, in a certain way, helped to decrease the deforestation in the state (see data in Table 2); on the other hand, the entrepreneurs who compose the industrial sector of the wood in the State of Rondonia have still not become aware of the need of forest handling or reforestation. The organs in charge of the environmental issues are to be blamed for the lack of coherence in the measures that have been adopted.

3.6. Ecological ICMS in Rondonia

The Ecological ICMS is the specific destination of part of the ICMS (state tax charged on the sales of goods and services) to the cities where the environment is preserved (Bacha & Shikida, 1999). It is an instrument of environmental management, being, therefore, a preventive and alternative way to avoid damages to the environment. By means of that tax, better discipline can be applied in the management of the environment.

That instrument originated from the search of alternatives for the public financing of the city administrations that, in general, possessed a restricted use of its territory for the implantation of certain activities that could cause damages to the ecosystems. The creation of that subsidy generates an incentive for the city to manage in a better way the areas destined to the preservation or conservation.

In general, in all experiences of the Ecological ICMS in Brazil, there is liberation of resources for the cities that possess Conservation

Units and other areas that are especially protected. The divergences appear in other aspects, such as: calculation form; whether to consider only Conservation Units under the responsibility of the State, or also the municipal and federal ones; and whether to include or not quality indicators of the Conservation Units.

The states that have ecological ICMS are Paraná, São Paulo, Rio Grande do Sul, Minas Gerais and Rondonia. There are also plans for its operation in the states of Santa Catarina, Espírito Santo, Ceará, Goiás, Rio de Janeiro and Mato Grosso do Sul (Bacha & Shikida, 1999).

In the case of Rondonia, the Ecological ICMS was implanted by State Complementary Law number 147/96, which substituted Law number 115/94. So, 5% of the amount that the cities of the State have the right to receive as a participation of ICMS are destined to cities which shelter Preservation or Environmental Conservation Units. Table 3 shows the criteria used in the division of the 25% of the ICMS among the cities of Rondonia according to both Complementary Laws mentioned above.

The cities that are entitled to the Ecological ICMS are the ones that they have Conservation Units. They are, according to the mentioned Complementary Law, "protected areas, established in significant ecosystems of the state territory in the Federal, State and Municipal Government's administrative scope, in the categories of the Ecological Station, Biological Reservation, Park, Natural Monument, Environmental Protection Area, Indian Reservations, Forest, Extraction Reservation, and others that are included in any categories of Conservation Unit, created by municipal, state and federal laws or decrees" (Article 3rd of Complementary Law number 147, dated in January 15, 1996).

According to Complementary Law 147, the share that each city is entitled to is defined by the organ in charge of managing of environmental policies of the state, based on the share which each city has as the total area of the Conservation Units.

Table 3 – Sharing of 25% of ICMS among towns and cities of Rondonia according to Complementary Laws numbers 115/94 and 147/96

Criterion	Law 115/94	Law 147/96
Added value	75%	75%
Proportional to the territorial area of city	0.5%	0.5%
Proportional to the agricultural production (agriculture, cattle and vegetal extraction) of the city	5.0%	5.0%
Proportional to the whole city production	0.5%	0.5%
Equal parts	19.0%	14%
Proportional occupancy rate of the city with Conservation Units		5.0%

Source: Rondonia State Assembly

The Ecological ICMS system in Rondonia has certain similarity to the one in Paraná, except for the relationship to the measures that involve calculation matters, for it considers only quantitative variables and not the quality of the Conservation Units.

This is a failure that needs to be changed, so that the goals that are behind this type of incentive instrument the environmental conservation can be reached. However, it is important to stand out that, in Rondonia, the cities that have their Conservation Units invaded or illegally explored, generating considerable damages to the environment, will have a decrease in their share of the Ecological ICMS. The reduced value will be distributed among the cities whose Conservation Units are in accordance to the environmental legislation.

The inspection of the aggression level and illegal explorations is followed by the management organ, along with other institutions. The control is done through a registration system of the municipal, state, and federal Conservation Units.

In the State of Rondonia, 21 cities, in a total of 52, are benefited by

the Ecological ICMS: Those which presented the largest increments in the receiving indexes of the quota in their share of the ICMS were Jamari, Costa Marques and Guajará Mirim (Table 4).

Table 4 – Rate of participation in ICMS quotas – cities of Rondonia which were benefited by the Ecological ICMS.

City	Participation Percentage before the Ecological ICMS	Participation Percentage after the creation of the Ecological ICMS	Increase in the rate of participation of the cities (%)
Jamari	0.3509	0.5708	62.67
Costa Marques	0.8589	1.3550	57.76
Guajará Mirim	1.1948	1.8076	51.29
Monte Negro	0.8323	1.1823	42.05
S. M. Guaporé	0.5568	0.78	41.67
Gov. Jorge Teixeira	0.4632	0.6302	36.05
Min. Adreazza	0.9367	1.1817	26.16
Candeias	1.4900	1.8408	23.54
Nova Mamoré	0.5947	0.7204	21.14
Machadinho	0.7790	0.9386	20.49
Alvorada	0.8362	1.0027	19.91
d'Oeste			
Cerejeira	1.1735	1.3827	17.83
Seringueira	0.4931	0.5747	16.55
Ji-Paraná	9.5280	10.9176	14.59
Espigão	1.5692	1.7764	13.20
D'Oeste			
Vilhena	7.4372	8.1980	10.23
Vale do Anarú	0.4181	0.4523	8.18
Rolim de Moura	2.7886	2.9973	7.48
Jaru	3.2733	3.49	6.82
Colorado	1.1949	1.2379	3.60
D'Oeste			
Santa Luzia	1.3603	1.3761	1.16

Source: SEFAZ (unpublished data)

Due to the short time of implantation of this instrument, it is still very early to evaluate the obtained results. Even in the case of Paraná, where the Ecological ICMS has been adopted since 1992, we cannot get to a definite conclusion about the obtained benefits. However, some considerable points are observed in the latter state: “an increase in the number and the surface of the protected areas, especially of Conservation Units; improvements of the Conservation Units; popularization of the debate on the subject, institutional improvement, fiscal justice; biodiversity corridors; job generation; possibility of the reproduction of the proposal in other states and the awakening of exploration of tributary policies” (Loreiro, 1998, p. 38). When the same effects appear in Rondonia, ICMS will be had as an incentive to the environmental management by the cities.

4. Evolution in the Number of Companies of the Lumbering Sector of Rondonia

In Table 5, the evolution of the number of firms of the wood industrial sector of Rondonia according to the activity branch is presented. Until 1987, there was an expansion of the enterprises that, basically, use massive wood from native forests (what was the case of the firms of mechanical processing of the wood). The expansion of the roads and the plans of development of the Amazon Region favored that expansion.

In the 90's, however, there has been a reduction in the number of firms like these. The progress of deforestation and the lack of sustainable exploration have led, since 1993, to the reduction of the log production in Rondonia (see figure 1). For this reason, sawmills have been disabling their plants or migrated to other areas where there is more readiness of native wood. Because of that, the number of sawmills in Rondonia decreased from 781 in 1987 to 535 in 1994, and they were only 180 units in 1997. On another hand, there has been a large increase in the number of furniture enterprises, which have more flexibility in obtaining wood in more distant places and choose the State of Rondonia for being closer to

large consumer centers (such as the Federal District and Southeastern states) and very close to large forest reservations. Besides, there was an increase in the demand for furnitures internally produced.

Table 5 – Number of enterprises in the wood industrial sector – State of Rondonia – selected years

	Number of firms					
	1980	1982	1985	1987	1994	1997
Sawmills		-	-	781	535	180
Manufacture of wood structures and carpentry artifacts		-	-	264	135	298
Manufacturing of wood plates of pressed or plywood, coated or not by plastic materials		-	-	07	34	34
Manufacturing of several items of wood.		-	-	35	233	173
Furniture manufacturing		-	-	95	234	486
Total	327	403	505	1,182	1,171	1,171

Source: Rocha (1999)

Obs.: Furniture manufacturers for 1982 and 1985 are not included.

The non continuity of many firms of wood mechanically processed took place, largely, due to the lack of the public policies in guaranteeing a sustainable development in the areas of Rondonia, maintaining, for future generations, the same availability of forest resources that the generations before used to have.

5. Conclusion

This paper analyzed how the sustainability of forest resources was considered in the federal and state development plans and policies of Rondonia. Along with this purpose, concepts of sustainable development and sustainability and the proposals of the Ecological Economy were used.

The federal public policies adopted in Amazon Region and, more specifically, in Rondonia, had as primary objective the development of the area and the incentive to the migration of people from other areas of the country to Amazon Region. The environmental issues were left behind, what intensified the implantation of a wood industrial sector, where entrepreneurs, stimulated by the easiness of obtaining forest resources and by the lack of guidance by public organs and agents to control the area, started to adopt a standard for obtaining such resources (forest) through extremely selective mechanisms, which were unsustainable in the long term. These caused and continue to cause the shortage of several forest species, as the *Swietenia Macrophylla* (mahogany), *Torresya Acreana* and *Cedrela Orodorata*.

Therefore, this immediatist view of the entrepreneurs was favored by the fact that, until 1986, public organs in charge of environmental issues in Rondonia defended sustainable development in theory, but their actions were actually not coherent with that kind of development. The concern with the sustainable development has been more present in the state policies implanted after the mid 80s, but the entrepreneurs' attitudes have not been changed yet. An alternative found by Rondonia's State Government as a way of managing the environment more efficiently was to implantation of Ecological ICMS.

The wearing out of forest resources in some towns have led to the decrease in the number of firms dealing with the mechanical processing of wood, which were essential to Rondonia's industrial sector of wood.

The prevailing short-term view on the use of forest resources should

be altered to a wider view about sustainability. State forest policies are necessary in order to stimulate the forest management and the reforestation. Besides, the guiding activities should not be limited to some cities. Recovering the forest of whole the State is important and fundamental.

For the adoption of those policies, resources and measures to modify the current administrative structure are necessary in order to decrease the existing bureaucracy in the adoption of the management plan. The time between the delivery of the proposal by the firms and its approval is quite long and, most of the time, causes no stimulation to do it.

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