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SOCIAL AND ECONOMIC IMPLICATIONS OF RECENT STRATEGIES FOR AMAZONIA: A CRITICAL ASSESSMENT

I. INTRODUCTION: RECENT STRATEGIES FOR AMAZONIA

The Amazonian rain forest has attracted international attention because of its role in the global climate, its largely still undiscovered wealth in biodiversity, its endangered indigenous peoples, and its unresolved challenge of harmonising the conservation of nature and the use of natural resources. On one side, the Brazilian society has embarked on the „valorizaçâo" and „integraçâo" of its remaining „frontier" areas, much in the same spirit in which the whole of Brazil has been occupied over the last 500 years. The establishment of new federal States by converting „territories" into States and by subdividing the large territories of Pará, Amazonas and Goiás is simply a continuation of the „conquista" and „frontier" philosophies, the most recent document in this spirit being the „Plano Plurianual 1996/99" (SUDAM 1995). However, there have also been other signals: On the occasion of the Brasilian President's recent state visit in Germany, the Federal Government published a brochure on Amazonia in German with a markedly different tone, emphasising the „Umkehr" („turn-around") from a policy of deforestation to one of protection (Brasil 1995a:8), and in another recent brochure (in English) of the Federal Ministry of Environment, Water Resources and the Legal Amazon one finds mention of a „reversal" of the „process of degradation" towards „sustainable development" (Brazil 1995:15).

The local rural populations, indigenous as well as other „traditional" groups, such as rubber tappers, „quilombo" settlers, ribeirinhos and other „cabôclo" inhabitants of the forest and their advocates, have always argued against the „myth" of the „empty space" in the Amazon. Ever since the publication of the influential international report „Amazonia Without Myths" (IDB/ UNDP/ACT 1992), the vision of preservation and sustainability has become widely shared, not only in Brazil, but also in the other member countries of the Amazonian Co-operation Treaty. However, public policies and the actions of local government agencies, enterprises and individuals have not yet changed very much. Outside the primary and near-primary forest areas, large cattle ranching, logging and small silvi-agro-pastoral production have been in conflict over land use; garimpo-type as well as large-scale mining has contributed to the pressure on the land, to environmental destruction and pollution. Urbanisation has created cities and towns around which intensive agriculture has developed. Between these urban areas a modern infrastructure in transport and communication is being built.

As one of the largest areas of the world still covered with primary tropical forest vegetation, central Amazonia is seen by many environmentalists as a prime target zone for strict conservation policies, where only traditional or new forms of extractivism which do not damage the forest would be permitted. The „Pilot Program for the Conservation of the Brazilian Rain Forests" (emphasis added), a co-operative effort of the Brazilian Federal Government and the Group of Seven (G7) places particular emphasis on those areas, but it also envisages and promotes sustainable use and ecologically sound „development" strategies.

Deforested areas with spontaneous secondary vegetation („capoeira"), with mixed perennial and annual crops, or even with monoculture plantations with monoculture and certain forms of pasture are not always destined for obvious „degradation". There does not seem to be a direct and unavoidable one-way road „from green hell to red desert", as had been assumed by many in the 1970s

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(Goodland/Irwin 1975). On the contrary, violent and legal land conflicts show that there is a very wide range of options, and it violence and „grilagem" (illegal land-grabbing by falsified titles and similar means) are to be avoided, those options should be discussed and chosen through political means and procedures.

Mining is also open to different policies - between strictly limited „enclave" activities and broad „corridors" and „axes" of inter-linked „development" area; furthermore, by definition, mining is not "sustainable", since every geological deposit is finite. This makes the very term rather problematic when referring to a region which has been and will remain largely one with what is often called a „mining vocation" such as Amazonia. We shall return to that point later.

On the whole, there is an urgent need to discuss the recent strategies for Amazonia. The prevailing decision-making criteria and procedures for determining land use in the region require a critical assessment. Wide-ranging concepts and arguments are being put forward by the defenders of the rain forest and ecological „sustainability" at the local, regional, national and international levels, but at the same time, destruction is going on, and poverty remains the major social challenge for public policies. A variety of approaches have been suggested and also partially implemented so that not only the inherent logic and the plausibility of these proposals should be examined critically, but also the actual results of certain strategies.

Without trying to bind the arguments together in a coherent whole, they are taken up separately in the following. Their wording and their implications as well as their institutional setting are discussed leading to suggestions with regard to research priorities and recommendations for international cooperation. Since the „Pilot Program" has reached a critical stage with the beginning of major development, conservation and research project, the international debt-nature issues are taken up first. A close look at recent national and international documents and research publications reveils that basic concepts such as „carrying capacity" and „sustainability" from the side of natural science, agronomy and geography, and „opportunity costs" and „resonance" from the side of economists and sociologists play an important role in the formulation of strategies for Amazonia by all persons and institutions involved, - often without a clear understanding of the implications. The critical examination of these concepts in section III is followed by a review of recent „Zoneamento" endeavours in the Amazon which are directly based on some of those concepts and related ones. Finally, the question is brought up what strategic effects are triggered when Amazonia is considered and called a „frontier" region. The analytical summary can be resumed by „no way around hard political choices" as the heading of section VI, calling on the scientific community in VII to concentrate on research, open public debate and accessibility of research results not letting it being dragged and lured into political power games such as the ones inherent in „zoning".

II. „DEBT FOR NATURE" AND THE G 7 PILOT PROGRAM

For Amazonia, the international dimension and global interest, as evidenced through the G-7 Pilot Program (PP/G7), add further weight to large-scale land-use decisions on the national as well as on the state levels. When the industrial countries are willing to pay for the „conservation" of the primary forest, the size of protected areas and the restrictions on land use become a question of price. That is why the debt-nature debate has a role to play in the analysis of recent strategies with regard to the Amazon.

The discussion on „debt for nature" often suffers from a confusion of dimensions:

- Thousands of dollars are involved, when a non-governmental organisation (NGO) buys a debt instrument in the secondary market and cashes it at the Central Bank in order to support a sister NGO in a rain forest country;

- Millions of dollars are involved, when a program of international co-operation sets up a series of „projects", such as the bulk of bilateral and multilateral activities within the G7 Pilot Program;
- Billions of dollars are involved, however, when the rescheduling of debt in the Paris Club is negotiated, including the IMF and World Bank consultations before, and afterwards with the New York „steering committee" negotiations with the private banks.

Public opinion in Germany and other industrial countries as well as the report to Chancellor Kohl by Dietrich Oberndoerfer, published in 1989, which formed the basis of the G7 decision on the Pilot Program, referred and still refers to this third level, the Paris Club and Brady Plan heights where - in the case of Brazil - billions of dollars at stake. In 1992, Brazil renegotiated its debt with public as well as private creditors successfully (IMF 1995: 14f.). Confidentiality prevents detailed empirical research, but there can be little doubt that the change in the stance of the Brazilian government before the Rio Conference UNCED 1992, from protest against alleged attempts to „internationalise" the Amazon toward „conservation" and „sustainability" by the Collor Administration in general and José Lutzenberger in particular, was very helpful.

However, in the course of time, other priorities were set at the German Chancellery, and the implementation of the Pilot Program was handed over to project administrators who think in millions, not billions of dollars or deutschmarks. The impact of „projects", however, is often the opposite of what Oberndoerfer and Kohl had in mind, namely strict conservation; still influenced by the acute debt crisis of the 1980s, they intended to link substantial debt reduction to the preservation of nature: Since a great deal of the claims were to be written off anyhow, one might as well try to get something out of it, i. e. a public relations as well as an environmental benefit. As to the costs of stopping deforestation in the Brazilian Amazon altogether, recent estimates range between US$ 0.5 and 10.8 billion per year, Abreu et al. (1996: 248) pleading for 6.5.

Since the motivations as well as the participants in debt (re)negotiations on the creditors side are generally different from those working on the „project level", co-ordination is not spontaneous nor automatically assured through administrative procedures. Looked at from the outside, it seems that more could and should be done by the G7 in the next round(s) of debt negotiations at the Paris Club level to back the Brazilian conservationist interest groups, environmental agencies and NGOs as well as the Cardoso Administration in general, in its efforts to implement the announced „reversal" of policies. The debt-nature link at the billion-dollar level in the Paris Club and the private banks' Steering Committees should remain on the agenda, and it should not be confounded with work at the other levels (see Barzetti 1993:180ff., where attention is also drawn to the „Iniciativa de las Américas" and its promises to cancel substantial bilateral U.S.-Latin American debt in return for the promise of serious environmental policies and projects).

Million-dollar projects and thousand-dollar back-ups for environmental NGOs, municipal agencies, national park authorities, etc. have their own logic and their own merits. One should not discredit them, because they would hardly contribute to substantial debt alleviation. Sometimes, this confusion leads to an unfair criticism of both the high level for not being operational and the grassroots level for not being substantially debt-alleviating, whereas a test of the „willingness to pay" on all levels, according to the agenda in question, could enhance the objectives of the Pilot Program by putting weight on the protection side in all conflicts over land use in the national, the regional and the local framework. Furthermore, there is a great potential for synergy effects between the the tree levels, once their respective merits and limits are clearly perceived and taken into consideration. Without entering to deeply into the PP/G7 details, let it be recognized that the specialized staff members in the relevant institutions are generally well aware of this potential, but that they need support from the outside.

III. THE CONCEPTS OF „CARRYING CAPACITY", „SUSTAINABILITY", „OPPORTUNITY COSTS" AND „RESONANCE"

Two of the most prominent concepts in land-use planning discussions about Amazonia are „sustainability" and „carrying capacity". In his doctoral dissertation in Biological Sciences at the University of Michigan, Philip Fearnside (1986) elaborated a definition of „carrying capacity", namely „the number of individuals that can be supported in a given area" (p. 70). In this thesis, he limited himself to human beings in rural settings alongside the Transamazonica Highway. However, in the abstract of his paper to this workshop, he extends this concept to include towns and cities:

„Carrying capacity estimation work needs to embrace the wide variety of productive systems used and contemplated for Amazonia and to be able to interpret information about these at a full range of scale from local communities to the region as a whole. This will require not only studies of different land use systems in rural areas, but also integration with studies of energy use and the limits to support of urban populations" (emphasis added MN).

Fearnside is not the only scientist who uses the term „carrying capacity" in that sense. The chairman of the International Advisory Group (IAG) for the Pilot Program, the geographer Prof. Gerd Kohlhepp has quoted the reknown grand old man of „eco-development" thinking, Prof. Ignacy Sachs in a recent article (Kohlhepp 1995:24):

„The PP consists of a set of projects that will contribute to the sustainable development of natural and human resources. What is the crucial meaning of sustainable development? The key issue of sustainability can be defined as 'improving the living conditions of human communities, while keeping within the limits of the carrying capacity of the ecosystem' (Sachs 1992)."

The writings of these and other authors who use „sustainability" and „carrying capacity" more or less, synonymously, have been very influential in Brazil and abroad, particularly in environmentalist and policy circles, but there has been very little, if any, critical assessment of these concepts and their implications on the part of social scientists. In this workshop on „inter-disciplinary research", some critical remarks calling for caution in the application of these biological and geographic concepts without, in any way, putting into question the sincerity of the intentions behind the use of the terms, are nonetheless in order. The aim of this critical assessment is to further our common objectives through the intelligent use of the appropriate analytical means and instruments of various disciplines thereby combining forces in an interdisciplinary effort.

Today, most people in the Amazon live in towns and cities (see Becker 1995) with their nearly universal lifestyles, more dependent upon inputs and transfers from as well as to markets in the rest of the world than upon their immediately surrounding rural areas. The options with regard to industry, transport, trade, services and communication vary greatly, and a strong point can be made for the assertion that there is no way to determine those options solely with reference to a quasi-biological „carrying capacity"of a „given area". For human beings, the term makes sense only for the very limited field of small-scale agricultural and forestry uses of land, on the one hand, or for the Earth as a whole, on the other. In between, there is simply no legitimate method to define the „given area" the „carrying capacity" of which one can reasonably talk about in a meaningful way, because that area would have to include every piece of land, including the subsurface, the resources of which are made available through mining and transportation from other parts of the globe.

Ever since the bronze, if not the stone age, man has been a „mining animal" (for an introduction of the concept of „homo minerus" see Nitsch 1994a:189), and mining, by definition, is not „sustainable" in the strict, biological sense as used by forest engineers and sometimes transferred to „the Amazon" or other geographical entities. It might be argued that „carrying capacity" and „sustainability" are nowadays en vogue, and undoubtedly, they make sense as gradualist (more-or-less) concepts; they are also quite useful when biological species and human impacts on small plots of land as well as when

the whole Earth and her climate are at stake, - so why not use the words and defend the environment in Amazonia with these terms going beyond clear-cut wildlife and protection issues?

As every intellectual knows, „words are weapons", - not merely useful tools and concepts in theories. That is why one has to evaluate the power and connotation of words very critically, and the possibility that they could instead backfire should always be considered. Since no human settlement for the last 10,000 years or so has been biologically „sustainable" in a strict sense, it is useless or even counterproductive to introduce a forestry notion of „sustainability" into the present debate. If mining and transport are taken into account, not even Manhattan Island can unequivocally be proven to be crowded beyond its „carrying capacity". How can madeireiros in Rondônia or garimpeiros in Roraima, road builders in Amazonas or the military in Acre, cattle ranchers in Pará or eucalyptus plantation planners in Amapá be convinced that the piece of land they want to use cannot „carry" that additional human activity which they have in mind? Using non-operational yardsticks such as „carrying capacity" and „sustainability" in their strict biological sense, it is easier to turn poor caboclos into a „population" far beyond the „carrying capacity" of any forest ecosystem, than to fight the „clearing" of the primary forest and the establishment of an economically and ecologically viable modern dendê or eucalyptus plantation which uses great quantities of fossil energy, fertilisers, pesticides, etc. and whose management might even have the economic means and the will to invest in soil protection etc. When economic feasibility and environmental assessment studies show a long-term viable enterprise, it is hard to imagine political and administrative resistance based on a scientific analysis of the „carrying capacity" of the original local primary or secondary forest ecosystem.

The attentive reader will have noted that in fact a semantic experiment has been tried in the previous two sentences: „sustainability" has been replaced by „viability", a term whose connotations are more modern, more economic, more technical, more developmentalist, and, at the same time, seemingly more convincing when it comes to defending entrepreneurial interests. Whether traced back to the Latin „vita" (life) or „via" (way), the word „viable" suggests a way toward life in the future without reference to a „given area". That is why it is analytically more correct as an intellectual tool in the modern world, but at the same time a more dangerous weapon, when it comes to destroying the forest. Perhaps it could and should also be appropriated and used by the other side.

There is an additional anti-ecological bias inherent in all three terms: the very term „capacity" implies quest for a maximum, thus driving planning considerations as well as scientific research toward identifying the „limits" of most intensive human use; „sustainability" has a certain maximising connotation as well, even though it is certainly weaker than the one implicit in „capacity"; finally, „viability" elicits implications such as „where there is a will there is a way" and „life always goes on" which tend to play down environmental costs and conservationist goals. There is a basic paradox in the fact that those concepts which are meant to combat destruction and degradation of the environment turn out to have an inherent anti-ecological bias.

Natural scientists who follow maximising lines of argumentation, surrender the basic critical role which we as economists and social scientists expect from them in interdisciplinary research and discourse, namely to voice what, in the first line of the „Declaración de Caracas" of February 21, 1992, on „Parques, Areas Protegidas y el Futuro de la Humanidad", is beautifully formulated in the following way (Barzetti 1993: 235):

„Reconocemos que la naturaleza posee un valor intrínsico y merece respeto, independientemente de su utilidad para la humanidad"[2]?

[2] "We recognize that nature has an intrinsic value und deserves respect, independently from its utility for mankind" (Translation MN).

Without recognising the „intrinsic value" of nature, the utterly utilitaristic, anthropocentric concepts of „carrying capacity" and „sustainability" cannot even serve to justify a single national park. In areas with fertile soils and low erosion vulnerability, any coverage with primary forest becomes an obsolete relic of the „wilderness past", because the human „carrying capacity" of the land and even of the forest in that given area can always be proven to be under-utilised; it only depends on the „technology" which is supposed to be applied by the additional human population.

Is it not the biologist's role to check and balance the commercial *homo oeconomicus*, not to praise and aggrandise him? By using maximising terms, he is being even more blindly utilitarian and greedy than the economist's *homunculus* who, at least, always thinks in „opportunity costs", i.e. the value of the opportunity forgone, when taking a decision, thus evaluating even the unspoiled forest and the virgin land for its eventual future value (e.g. biodiversity, reserve land and use of indigenous knowledge), and contrasting this with their immediate use (see Amelung/Wiebelt 1991, Beckenbach 1991, Hampicke 1991, 1992). The example of a beach hotel in a national park in Santa Lucia in the Caribbean (Barzetti 1993:3) provides a case in point: Cost-benefit analysis based on opportunity costs showed that the economically better option was leaving the park untouched and not building the hotel. It is hardly imaginable, how a „carrying-capacity" analysis, let alone „sustainability" or „viability" criteria could have achieved that result, since the „given area" at the beach could certainly have „carried" or „sustained" a hotel in a „viable" way, depending on the parameters. The point is that the value of lost opportunity to have an untouched park, with hotels farther away, can hardly be incorporated into a calculus which refers to a „given area".

Hampicke (1991 and 1992) and every other textbook on ecological economics provide a vast range of methods and examples of how it is possible to operationalize the concept of opportunity costs with regard to the valuation of nature. The above-mentioned reference to the „willingness to pay" in debt-for-nature deals on all levels is, in fact, one application of that line of thought. It also shows that „costs" and „benefits" do not always refer to the same individual or decision-making body. This is why cost-benefit analysis is not a panacea either, since natural resources simply do not have prices attached to them and can be appropriated freely, as long as society does not put price tags on them. Cost-benefit analysis often proves to be a weak tool, too, or even a weapon that has backfired: When costs are borne by others (e.g. foreigners), any benefit appears to justify a „project". Nevertheless, the defenders of the Amazonian rain forest and of ecologically sound human development should not pass up the chance to take the economist's „lost opportunity" seriously and attempt to use his weapons which are often believed to be only useful and available for „the other side".

Social sciences offer not only the arsenal of the neo-classical economist with his thinking in alternatives and opportunity costs, but also the ecologically rather gloomy vision of the „social-systems" theorist writing on „ecological communication": According to Luhmann (1988) and his school, political decisions and socio-economic processes should be analysed as systems having their own logic and their own dynamics of auto-reproduction („auto-poiesis" in general systems theory); interaction between different systems is always precarious; at the interface, activities in one system must find „resonance" in the code of the other one. The „resonance" metaphor refers to the interdependence of response between mechanical waves and sound waves, and every violin builder can tell you about the precarious nature of the „interface" and what an „art" it is to tune the two „systems" - music and its acoustics on the one side, and wood and its mechanics on the other - and their respective „codes" in a compatible way.

In a more general sense, any response between different, but somehow interdependent and co-existing systems each of which functioning and reproducing itself according to its own logic can be called „resonance". The killing of a protected animal, for instance, must be detected, recorded and transferred into the language and procedures of penal law within the judicial system, before the death

of the animal can be sanctioned, i.e. find resonance through a fine, imprisonment or other punishment.

What gives direction to land-use patterns, conservation and development in a modern society based on fossil energy, minerals, international trade, communication networks, etc., are socio-economic-politico-administrative processes which function within their own logic and even without much regard to one another, let alone to local resources, landscapes and „nature" in general. Socio-political processes might destroy the forest, poison the water, kill the animals and the human beings, or it might protect them, leave them untouched or „develop" them. The lesson from this type of sociological systems approach with its emphasis on ecological communication, is to pay very close attention to the „resonance" which natural phenomena find in society and its specialised subsystems. In general, resonance and reactions are inadequate, oscillating between dumbness, negligence and hysteria. The identification and measurement of critical variables and their critical values by natural scientists have to be combined with the transfer of these information bits into the relevant human communication systems, such as the economy, which only understands the code of money so that environmental concerns have to be translated into fiscal incentives or disincentives, fines, profits, and the like.

Another social subsystem, namely the political system, only understands votes, - at least that is the norm in a democracy. Therefore, the electorate's wishes with regard to land use find resonance at the political level in the politicians' decisions over planning maps, demarcation of reserves, budgetary allocations for environmental agencies, etc.

The concept of „resonance" forms the basis of what is often called „environmental monitoring". It leads one to see very clearly the importance of environmental agencies and NGOs, since generally they are the social subsystems to monitor the critical variables and values which the scientists determine, detect and measure. They also direct the relevant information toward the specialised social macro systems such as the economy, politics and the judiciary.

The outcome of all these very complex social activities is independent of the intentions of individual political and economic decisions, since there is no mastermind managing a *tabula rasa*, but always a multiplicity of decision-makers whose actions might, in sum, lead to some kind of equilibrium as well as to chaos. The assumption of a mastermind, sometimes projected into politicians and usurped by technocrats, can even lead to counterproductive behaviour, as will be discussed in the following section.

IV. THE CONCEPT OF "ZONING" („ZONEAMENTO ECOLÓGICO-ECONÔMICO")

On the national level and on the level of the individual states, Amazonian strategies in Brazil have recently centred around serious attempts at „zoning" („zoneamento ecológico-econômico"). Large areas, for instance, a whole state like Rondônia is divided into zones of graded intensity of use (Rondônia 1989): In Zone 1, agricultural production is allowed to take place, whereas Zone 6 comprises areas of complete protection, Zone 5 is destined for careful forest use, etc. (see figure 1). The idea underlying zoning is to integrate the geographical and thematic maps of soils, vegetation, settlements, etc., with land-use planning maps for future infrastructure projects, national parks, other protected areas and zones of more or less intensive agro-silvi-pastoral use of the land.

The idea of the six zones has spread from Brazil to the other Amazonian countries through the above-mentioned report „Amazonia Without Myths" (IDB/UNDP/ACT 1992:73) and also to the rest of the world through the World Bank's „World Development Report 1992" (World Bank 1992, Box 7.6). In a more general way, FAO (1993) has also propagated a similar approach. Meanwhile, zoning has become a constitutional mandate in various States of the Brazilian Federation, and the Pilot Program

has been trying to push its practical implementation so that a critical assessment of that concept gains an international as well as a very practical local and national dimension.

The basic problem with the allocation of land to one or the other use by means of governmental planning decisions rests in narrowing the options for a large area down to a comprehensive map of various zones with definite limits. Generally, thematic maps on soils, vegetation, animal habitats, etc. provide a solid basis; then, the concept of „ecosystem" serves as an integrating vision which is assumed to be able to embrace all aspects of nature as well as man, modern society and the „human impacts" on nature.

The next operational step has succinctly been described by the well-known Brazilian geographer Ab'Saber (1989:4):

„Estabelecer as bases de um zoneamento ecológico e econômico em uma determinada conjuntura geográfica equivale a realizar um estudo para determinar a vocação de todos os subespaços que compõem um certo território, efetuar o levantamento de suas potencialidades econômicas, sob um critério basicamente ecodesenvolvimentista"[3] (emphasis added MN).

Listening to the „voice" of nature in order to detect and „determine" the „vocation" of „all" parcels of land is, of course, a romantic, pre-modern idea; however, it becomes a powerful driving force, when scientists, technocrats, environmental non-governmental organisations and the military join ranks and efforts. Proceeding in this way, the definition of more or less homogeneous „sub-spaces" and the „diagnóstico" studies of their „economic potential" for „all of them" is bound to become an unending endeavour. Because of the inherent and unavoidable arbitrariness in the definition of the zones and the borders between them, it turns out to be of crucial importance to gain access to the small, elite decision-making group of „listeners" who convert the mandates of nature's „voice" into laws and decrees for man and society, and who cloud and protect this secret.

With the integration of „clean" geographical maps on one side and utterly political planning maps on the other, by a small group of academics, technocrats and military men, the basic philosophical difference between analysing what is and deciding on what should be done, i.e. between science and politics in modern society, is lost. Once again, „carrying capacity" creeps into the discussion as a normative concept, and some kind of general „vulnerability", measured by some index of items such as inclination, soil quality, rainfall, sunshine, vegetation, rare species, wind exposure, etc. The selection and the weight attributed to the items within the index remain arbitrary, but „vulnerability" turns into a seemingly objective intermediate stepping stone between what is and what should be done or not done. The scientists and the planning professionals are misused in an attempt to avoid transparency for hard political choices that need to be made.

The fact that other options tend to be pushed aside in a technocratic gesture could be tolerated or even welcomed by advocates of protectionist policies and truly sustainable use, if zoning had a pro-environmental bias. But is has not: Ab'Saber's concept of „economic potentialities" is, like „capacity", an inherently maximising concept, one that seeks for the most „potent" economic uses and condemns conservationists to playing the role of unscientific romantics which is, of course, exactly opposite to his own explicit writings and conference contributions as well as to his intentions as one of the most active defenders of the Amazonian rain forest, - but it is immanent in his words.

The false „holism" hiding behind zoning is sometimes even accompanied by an anti-Cartesian discourse as well as an usurpation of „harmony with nature" for the resulting map. However, since zoning is inherently negative, because a „zone" is defined as prohibiting certain forms of use, nobody

[3]"To establish the bases for ecological and economic zoning in a circumscribed geographical setting means to make a study in order to determine the vocation of all the sub-spaces which compose a certain territory, and to make a survey of their economic potential under a basically ecodevelopmental criterion" (Translation MN).

likes it, not the landowner, nor the labourer, the shopkeeper or the teacher; everyone wants to live in a zone that permits a somewhat more intensive use of the land, e.g. the paving of roads. For this very reason, every citizen and voters hates it, and zoning can only be carried through confidentially. Here, the military come into the picture, the co-ordinating agency on the national level being the Secretaria de Assuntos Estratégicos (SAE), the institutional successor of the extinct Serviço Nacional de Informaçöes (SNI), the secret police of the military government (for a certain continuity see Chimanovitch 1993).

An alternative way to have zoning legislation passed is to sweeten „negative" zoning with „positive" promises of substantial infrastructure projects balancing the loss of options (cost) with additional infrastructure value (benefit).

Serrâo/Homma (1993:291)stress that point very clearly:

„Agroecologic and economic zoning must be accompanied by strong technical assistance programs and a strong social infrastructure" (emphasis added by MN).

Zoning, however, is an activity which is, by its very administrative logic, something definitely different from infrastructure planning which is typically a sector affair. That means that there is an incentive for the all-round „zoneamento" planners to promise oversized sector projects and - because of uncertainty which leads to high „discount rates" for all kinds of vague promises - for the people to demand much more than they can ever expect. Bureaucrats in the individual sector infrastructure departments of public administration love zoning because of that, of course. Finally, scientists are also generally in favour of zoning, since, as already mentioned, their thirst for never-ending studies and the corresponding funds as well as their dream of converting knowledge into power, i.e. of scientific information of what is into a definition of what should be done, seems to become true. The pro-zoning coalition, then, is quite strong, even though the predictable results are unrealistic plans, anti-democratic intransparency of public decision-making procedures, general discontent with politicians and administrative agencies because they confine every citizen to a negatively defined zone (put him or her in a „cage"), anti-ecological bias (since oversized projects are put into the air), and everybody's interest in intensifying land use is encouraged by this type of land-use planning which seems so convincing and rational at first sight.

The history of zoning provides the clue to its merits and shortcomings: Zoning has been applied to land-use planning in cities for a long time and with certain success; as in the countryside, every landowner has an interest in the most intensive use of his or her own plot of land, because it increases the value of that land; however, it is only in towns and cities, particularly in residential areas, that the owner of nearly every house or neighbourhood has a definite interest in keeping down the intensive use of his or her neighbours' plots - a green park area nearby being his or her preference; that is why there is a socio-political equilibrium between conservation and intensification in the use of land and nature in city planning. In contrast, no rural dweller has any interest in limiting a neighbour's intensity of use.

In the Brazilian countryside, there is probably an additional clue for the attractiveness of zoning to be found in the vastness of large fazendas: Of course, every large ranch or plantation with tracts of primary or secondary forest is being „zoned" by the owner according to the „vocation" of „all" the diverse parcels of land, - but also according to his or her preferences and capital endowments. The transfer of this principle of plain rational behaviour from the micro-economic agent with full private property rights, i.e. the „patron", to the public planner who can only prohibit or not prohibit the full use of those private property rights, leads to the fundamental problems of „Zoneamento" as described above, which can thus be seen as results of something like a „patronal misunderstanding" of the role of the State in a capitalist society.

V. AMAZONIA AS A „FRONTIER" OR A „POST-FRONTIER" REGION?

The attraction of zoning as a planning instrument is particularly high in such *tabula-rasa* situations as following colonial conquests. The very term „mapping" has come to signify a search for domination and control, for definition and allocation by fiat decisions, - the typical metaphor being the „frontier".

This term has often been applied to Amazonia, and it can be said to contain more than a grain of truth. But, again: „Words are weapons"! That is why a critical assessment of the implications of the term „frontier" is essential, before its use or non-use is recommended for intellectuals in public discourse.

A „frontier" always presupposes a line (or area) between „us" and „them", between „cosmos" and „chaos", between „inside" and „outside", between „here" and „there", between „civilisation" and „barbarism". The frontier marks the borderline between legitimate private violence (toward the barbarians) and the state monopoly of violence (within the civilised area); beyond the frontier, there is a lawless zone, an area which is typically disputed between barbarians, other outsiders such as pirates and competing nations (including „internationalisation" agents) on the one hand, and „the civilised" on the other. Since the conquest takes place in the name of „progress", „development" and „civilisation", nature as well as the human beings living beyond the frontier are necessarily regarded as enemies and obstacles to progress and civilised life. Bringing „law and order" to the „frontier" justifies violence and all kinds of club-law against the alleged „law of the jungle" („there") by self-appointed sheriffs and their constituencies.

If these are the implications of „frontier speak", all efforts of the defenders of the Amazon should be directed toward de-legitimising its use. They should insist that „the frontier is the border" of the country, and every piece of land as well as every human person on Brazilian soil belongs to a civilised, modern nation. The State has the legitimate monopoly of violence, and its citizens in Amazonia have the same right to public services and infrastructure as in other parts of the nation.

Amazonia might have been the „last frontier" in the past few decades, but now the Amazonian people live in a „post-frontier society" (Cleary 1993, with a somewhat different intention), where the laws of the land rule as everywhere else in Brazil and where the primary tropical forest has become something like the „Botanical Garden", the „Central Park", the „Bois de Bologne" or the „Grunewald" of the civilised „city-nation" of Brazil. How else can a tropical forest be turned from a „wilderness" to be conquered into a precious „treasure" which is to be preserved and protected?

Academics as well as journalists, planners and administrators might disagree with this plea, because Amazonia „really" still presents traits of the „frontier". Nobody can deny that, but it is not the point. When the use of this word promotes violence and destruction, why not try to take this weapon away from the madeireiros and grileiros, the violent men and the *tabula-rasa* planners? At least stop playing their game by using the word uncritically! The relation between reality and words is always loose and full of opportunistic and emotional as well as pragmatic implications; in epistemological terms, it is an essentialist error to postulate a direct link. Intellectuals have no other weapons than words, so they should not hesitate to use their limited power of defining the world through words and to introduce a different type of discourse, when old words turn out to promote harmful ideologies and actions.

VI. SUMMARY: NO WAY TO AVOID HARD POLITICAL CHOICES

The point can hardly be overstated that, for good or evil, there is a very wide range of land-use options in the Amazon as everywhere else in the modern world, and that there is no way to avoid the corresponding hard political choices. Immense sums of money are at stake which will, according to the political decisions taken with regard to their use or non-use, determine, one way or the other, what is going to happen in the region. The presumed „vocation" of this or that hill for managed forestry,

strict preservation, annual cropping, plantation production or sheer degradation will hardly be paid attention to, even when this voice and its „calling" should find resonance in the paper of a scientist. Not that detailed maps should not be drawn, - quite the contrary; but „clean" maps should be made available to civil society and to the international community, and the future planning maps should be „scenarios" to be decided on by democratic procedures, not the result of technocratic exercises.

Since nature has no voice in all this, her advocates and their arguments become of prime importance, since they determine the „resonance" and, by that, to a certain degree the feedback of human action on nature. Furthermore, since protection of nature always signifies a restriction on human activities, the usual procedure for protecting larger tracts of land, namely the national park in its various forms, turns out to be a wise social invention: The decision is taken in the national capital, so that only a small fraction of the relevant electorate is restricted, - and the others are relieved.

One other alternative to comprehensive zoning turns out to be also ecologically and politically wiser, too: Planning around large infrastructure projects in a „Plano Diretor" offers a certain valuable service to the population while, at the same time, demanding the protection of certain areas; there is a positive *quid pro quo* for the inherently negative „zoning" which goes with this method and which makes protection of nature acceptable and planning alternatives transparent for political debate.

Meanwhile, the problematic experience with detailed, comprehensive zoning of the Rondônia type in practice has led the Ministry of Environment, Water Resources and the Legal Amazon limit zoning exercises by concentrating on „Special Zones" (Indian Areas, Extractive Reserves and Conservation Units) and „Critical Zones" which, „in view of the speciality of their environmental systems require adequate technologies for their management" (Brazil 1995:22), leaving all the rest to the category of „Productive Zones". That way it should be possible to define the first two zones as corresponding more or less to the scarcely populated categories 6 and 5 in Rondônia. When the third category is left as a large residual comprising zones 1 to 4, it should be possible to avoid the most problematic anti-ecological and anti-democratic biases of zoning which, as a constitutional mandate, can hardly be completely abolished. Including stretches of primary forest as parts of the „productive" zone is probably not an easy task, but it should not be impossible, since virtually no major area of Amazonia is really disinhabited so that „production" is already going on, even in the more remote regions, - the most remote ones being protected as one of the first two categories.

Unfortunately this rather reasonable reduction of the previous six zones with various sub- and sub-sub-zones to only „three basic types of zones" (emphasis added MN) in the paper in English from the Ministry at the national level has not yet found its way into the „Diretrizes Institucionais" sobre „Planejamento e Zoneamento" in the „Documentaçâo Básica" of the recent policy paper on the „Política Nacional Integrada para a Amazônia Legal" of the National Council on the Legal Amazon (Brasil 1995b: 26f). It has not even trickled down to the SAE document of August 1995 (SAE 1995) nor, on the side of the scientists, to the „Breakdown of the Methodology for the Execution of Ecological and Economic Zoning by the States of the Legal Amazon" of July 1995 (Becker/Egler 1995). The planning activities at the state level seem equally to have been left out of this reversal of concepts, - as far as one can judge from the outside as an academic observer. It should be recognised, however, that a step in the right direction has thus been made on the national level, which comes close to UNESCO's concept of „biospheres" with their „core" and „buffer zones" in special areas, leaving the rest of the region or country in question to the general laws of the land (see Clüsener-Godt/Sachs 1995). Thus the conservation areas are protected from being drawn into conflicts between zones 1, 2, 3 and 4 on the Rondonia map. It can only be hoped that this internationally recognised method will be adopted and that the detailed, comprehensive zoning à la Rondônia will turn out to have been no more than an episode in Brazilian land-use politics and planning.

Since a great deal, if not most of the economic and infrastructural activities in the region are financed through national and - to a smaller degree - international transfers and subsidies (including those by

state enterprises such as CVRD and ELETRONORTE), political decisions play an even greater role in determining land use than the economic decisions of private individual economic agents. That is why, the responsibility of those decision-makers and their academic advisors can hardly be understated.

Any summary of the discussion on concepts such as „sustainability" has to emphasize that critical remarks on the use of terms do not invalidate the pursuit of the strategy envisaged by most of the users of those concepts. The point is that words are weapons in political struggles and should not be used naively. In addition, words and concepts have often hidden normative and pragmatic implications which may lead to paradoxical results. Finally, concepts and tools are not inherently on this or the other side: cost-benefit analysis can turn out to be useful for defending the forest and the caboclo, and carrying-capacity analysis can legitimize deforesting for cattle ranching, if used intelligently.

VII. SUGGESTIONS FOR FURTHER STEPS

This emphasis on options and on the unintended results of individual as well as collective decisions in complex socio-political processes leads to the following suggestions with regard to the four items mentioned in the letter of invitation to this workshop:

1. Research Priorities

- Historical analyses of key areas and sectors for the purpose of providing scenarios for future developments and actions;
- economic and ecological aspects of developments in the Amazon can be of the „win-win", „win-lose", „lose-win" and „lose-lose" type. Key activities should be investigated in interdisciplinary teams and networks to identify the win-win as well as the lose-lose operations, to establish monitoring mechanisms („resonance") and to make critical assessments of win-lose/lose-win options without obscuring the hard choices that are required;
- exercises in the strictly economic valuation of primary forests and the opportunity costs of cutting down the trees or not cutting them down, of sustaining a *capoeira* economy or a tree plantations or mixed agro-silvi-pastoral peasant farming should be encouraged so that more rational choices can be made with regard to land-use;
- opportunity cost accounting should be combined with an analysis of the „willingness to pay" on the side of the G7 and other industrial countries; „debt-nature-swaps" on all three levels - NGOs, aid agencies and debt negotiators - should be designed and implemented with an accompanying research component;
- interdisciplinary workshops on methodology and research strategies should be organised, e.g. around the concepts of „carrying capacity", „sustainability" and „ecosystem", as well as „opportunity costs" and „resonance", and the implication of those concepts for public policies in the Amazon;
- accompanying research with international co-operation projects.

2. Suggestions for the Improvement of Information Flows

- Research money should be made conditional on the readiness to provide other research and teaching institutions as well as policy-makers and NGOs with the documentation involved and with the results; research institutions, universities and environmental agencies in the Amazon region should be the most important recipients of this information flow;
- translation activities should be generally enhanced and made eligible in project proposals, particularly from foreign languages into Portuguese and Spanish to maximise the resonance in the Amazonian countries. Individual authors, particularly dissertation writers, are seldom in a position to have their theses translated and published without some financial assistance.

3. Main Obstacles for Sustainable Development

- The most formidable obstacle is, of course, the modern life-style in general, which has been „sustained" by mining non-renewable resources for centuries, if not thousands of years, making the objective of „sustainability" in an absolute sense somewhat elusive, - without discrediting it as long as it is used in a relative and gradualist („more or less") manner;
- in Amazonia (or Brazil and Latin America in general) there is a temptation to attain what is sometimes called „First World" goals with „Third World" means, e.g. steel with charcoal (in-stead of pit-coal), automobile fuel with sugarcane (instead of gasoline), hamburgers with natural pastures (instead of feedlots), air-conditioning with hydro-electricity (instead of coal, natural gas, oil or nuclear power) - at the expense of the environment;
- the peoples of the forest and their knowledge and interests are not taken seriously;
- the experience with zoning and other instruments of land-use planning should be evaluated, since there are strong indications that certain administrative and fiscal mechanisms are utterly counterproductive in achieving ecological as well as political and economic goals.

4. Recommendations for Co-operative Research in the Amazon Region

- Bilateral projects of scientific co-operation should be extended to the other partners of the Amazonian Treaty;
- basic and applied research should accompany all projects and programs of bilateral and multilateral co-operation in the Amazon region, particularly agro-ecological research;
- the claims of the indigenous peoples of the Amazon, organised or not in the „Coordinadora de los Pueblos Indígenas de la Cuenca Amazónica (COICA)" and other organisations, should be consulted whenever they request participation in the definition and implementation of research which is of interest to them;
- unconventional food and pharmaceutical products are typical areas of common interest to indigenous peoples, biologists, governments and enterprises; property rights should help in the empowerment of indigenous peoples;
- the management of areas of conservation is another field in which traditional knowledge and institutions should be able to be blended with modern legal and management instruments;
- the universities and research centres in Amazonia should be given incentives for international research and extension projects, such as the „pesquisas dirigidas" projects of the G7 Pilot Program.

This list of suggestions should be regarded as introductory points for an open and stimulating academic and political discussion.

Figure 1: Definition of Zones in the „Zoneamento Sócio-Econômico-Ecológico" in Rondônia (Decreto No. 3782 de 14.06.1988)

PROGRAMA POLONOROESTE

Zona	Legenda
1	Zona de ordenamento e recuperação das atividades agrícolas, agropecuárias, agroflorestais, silvo-pastoris e florestais, com alta concentração de lavouras diversificadas, aproveitamentos florestais- e desenvolvimento localizado de pastagens para produção de carne e leite a nível de pequeno produtor rural em solo fértil.
2	Zona destinada ao ordenamento, recuperação e desenvolvimento da atividade agropecuária, tendo por base, em primeiro plano a agricultura consorciada em sistemas agroflorestais e agro-silvo-pastoris, a ser apoiada a nível de comunidade de pequenos produtores e em segundo plano a pecuária de grande e médio porte, intensiva (carne e leite) em solos com fertilidade moderada e extensiva (cria e recreia) em áreas de média e baixa fertilidade, congelando a prática de pastagem pura (monocultura) em todos os níveis.
3	Zona ribeirinha, indicada para o ordenamento e desenvolvimento de sistemas múltiplos de aproveitamento da oferta ambiental de várzeas e, terras firmes marginais, baseados na diversificação de modelos agroflorestais, silvo-pastoris exploração florestal, extrativismo vegetal e atividade pesqueira, sem expressivos graus de modificação do ecossistema.
4	Zona de ordenamento e desenvolvimento do extrativismo vegetal, dada apredominância de seringais nativos, associados ou não a castanhais e outras essências florestais produtoras de gomas, óleos, frutos de raízes exploráveis. Trata-se de ambientes frágeis, onde o aproveitamento extrativo deve ser feito com manejo dos recursos florestais, sem alterações dos ecossistemas.
5	Zona de ecossistemas florestais ligeiramente frágeis, onde predomina os tipos fitofisionômicos caracterizados pelas florestas ombrófila aberta e densa, com pequenas difusões de florestas estacional semidecidual, comportando expressivo potencial madeireiro indicada para o ordenamento florestal visando o aproveitamento florestal, de espécies maneiráveis em escala comercial.
6	Zona de ecossistemas muito frágeis, que requer proteção e manejo ambiental para preservar ou conservar paisagens únicas ou características ou beleza cênica natural, ou a manutenção da cobertura vegetal para impedir erosão, garantir a estabilidade de nascentes, controlar, a pureza dos cursos d'água, reduzir riscos de inundações, manter micro climas locais, habitat de inúmeras espécies da micro, meso e macrofauna, além de influir e participar de equilíbrios ecológicos extremamente delicados. Inclue-se nesta zona todas unidades de conservação institucionalizadas e Áreas Indígenas.

Source: Governo do Estado de Rondôonia / Secretaria de Estado do Planejamento: Plano Agropecuário e Florestal de Rondônia - PLANAFLORO. Programa POLONOR-OESTE, Porto Velho 1989, mapa.

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