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1. INTRODUCTION

1.1 The proposal: The Hidrovía Paraguay-Paraná navigation project

The governments of Argentina, Bolivia, Brazil, Paraguay and Uruguay propose to undertake the Hidrovía Paraguay-Paraná navigation project. The purpose of the proposed project is to construct and maintain a reliable and efficient waterway that would stimulate production in the region as well as regional and nonregional trade through lower transportation costs. This is to be achieved by dredging a deeper navigation channel along the 3400 kilometer river system, removing rock-outcrops and straightening of bends and dredging of shallow sections. This low-cost transport corridor would mainly benefit the export of low-priced bulk commodities, such as soy beans and iron ore.

The project and its associated developments are expected to have significant environmental impacts on the Pantanal and Chaco wetlands, located on the borders of Bolivia, Brazil and Paraguay, containing biodiversity of recognized global significance. The direct and indirect impacts on the catchment area's local population of considerable ethnical variety could be important.

1.2 Involvement of the Inter-American Development Bank

Among various sources of finance, the Inter-American Development Bank (IDB) provided financial support to the Intergovernmental Committee on the Hidrovía (CIH) to carry out a feasibility study^{1]} and an environmental assessment^{2]}. Specific objectives of the IDB-funded studies are to support the CIH through institutional strengthening and to furnish the governments concerned with high-quality studies that would provide a framework for the governments to base future decisions related to the development of the waterway.

The IDB has not reviewed the studies but is currently forming a panel of Experts that will indicate the course of action to be taken for specific investment projects related to the Hidrovía project which may be submitted to the Bank by the 5 governments.

1 Estudios de Ingeniería y viabilidad técnica y económica del mejoramiento de las condiciones de navegación de la Hidrovía Paraguay-Paraná (Módulo A y B1), Diciembre 1996, Consorcio Hidroservice-Louis Berger-EIH.
2 Evaluación del impacto ambiental del mejoramiento de la Hidrovía Paraguay-Paraná (Módulo B2), Febrero 1997, Consorcio Taylor-Golder-Consular-Connal.

1.3 The Panel of Experts' report and the NGO's study

The studies have been reviewed by a Panel of Experts convened by the Environmental Defence Fund (US) and the Fundacao Centro Brasileiro de Referencia e Apoio Cultural (Brazil)³. The Panel's mission was to (i) provide technically-sound comments and critiques regarding specific components of the engineering feasibility and environmental assessment studies, especially related to environmental, economic and social impacts in the La Plata Basin and the Pantanal and (ii) to use the technical considerations raised in the critiques of the official documents as a basis to develop guidelines for the formulation of sustainable development alternatives for the La Plata Basin and the Pantanal.

The Netherlands Development Agency (NEDA) financed a study⁴ which has been performed by three non-governmental organizations from Brazil, Bolivia and Paraguay. The aim of the NGO's study was to provide background information which can be used as reference material in the review of the IDB-funded studies.

1.4 Motive and mandate for this review advice

In his letter dated 16th of September 1997 (appendix 1) the Minister for Development Cooperation in the Netherlands has invited the Dutch independent Commission for Environmental Impact Assessment to carry out an advisory review of the IDB-funded studies. The aim of the review is to check if the studies contain sufficient information to guarantee the full integration of environmental considerations in decision-making. The studies should be adequate and should not contain inconsistencies. If shortcomings are found, the seriousness of this lack of information for decision-making will be assessed and recommendations will be formulated to address these.

The Minister also asked for an opinion about the added value of the Panel of Expert's report and the NGO's study and finally requested to pinpoint contradictions between the different studies and to give an opinion about the underlying conflicts of interest.

This advice has been prepared by a working group of the Commission. The members of this working group are listed in appendix 2. The group represents the Commission and will therefore be referred to as 'the Commission'. In the Commission the following disciplines are represented: port- and river engineering, hydraulics, transport economy, ecology, land-use planning, watershed management, socio-economy.

1.5 Approach used for review by the Commission

The Commission felt that it was inserted into an evolutionary process, with a diffuse decision-making process with many stakeholders involved. It is not clear if the 'go/no go' decision for the project has already been taken by the 5 governments and whether alternative solutions are still possible (and thus realistic) or are already decided upon.

In order to structure the review, the Commission decided to distinguish 4 levels of analysis at which alternatives could be defined, i.e. (1) strategic level - solution alternatives; (2) project level and project alternatives; (3) alternative activities within the proposed/selected project, and; (4) alternatives at the level of prevention, mitigation and compensation measures (see figure 1).

3 The Hidrovía Paraguay-Paraná Navigation Project, Report of an Independent Review, July 1997

4 Bases para la Evaluación del Proyecto de la Hidrovía Paraguay-Paraná: Compilación y Sistematización de Información Básica sobre la Cuenca del Río Paraguay; Agosto 1997. ECOA, Brazil, ASEO, Bolivia, Sobrevivencia, Paraguay

Figure 1: The different levels at which alternatives can be defined (*between brackets an example*):

Based on this step by step approach the Commission started with a review of the Terms of Reference specified by the IDB for Módulo A and B and took the liberty to comment on the quality of these ToR to address the development issues at hand. As a next step, the Commission carried out the review of the IDB-funded studies according to the ToR given.

The IDB-funded studies have been prepared in accordance with ToR for:

- The improvement of navigation of the Paraguay-Paraná Waterway from Santa Fé to Corumbá/Puerto Quijarro, and the installation of navigation aids from Nueva Palmira to Corumbá/Puerto Quijarro (Módulo A, concerns phase 1 of Hidrovía, mainly restoration of navigation capacity over about 2300 km or 65% of the total length of the waterway);
- The engineering studies and plan of execution for the Paraguay-Paraná Waterway (Cáceres-Nueva Palmira) and the installation of navigation aids from Corumbá to Cáceres (Módulo B1, phase 2, medium- and long-term navigation improvement of the entire Waterway, beyond the restoration stage of phase 1);
- Performance of the Environmental Impact Evaluation of the Development of the Paraguay-Paraná Waterway (Módulo B2).

The review of the IDB-funded studies has been carried out by the Commission according to these ToR's, although these do not coincide with the site-specific ToR that the Commission normally^{5]} would have prepared for this project. Nevertheless, the experience and acquaintance of the working group members with the local situation and with EIA permitted to use the above mentioned

5 The Commission normally prepares ToR on the basis of a site visit and discussions with parties involved

guidelines as a review framework. For this reason and because of time constraints, it was not considered necessary to develop new site-specific guidelines.

As a third step, the added value of the report of the Panel of Experts and of the NGO's study was assessed at the 4 levels of analysis in figure 1.

1.6 Outline of the advice

In chapter 2.1 the Commission makes observations on the main shortcomings in the ToR (which are consequently also shortcomings in the engineering studies and the environmental impact assessment (the IDB-funded studies)). Recommendations are given on how these shortcomings can be restored.

Chapter 2.2 gives an overview of the findings of the review of the IDB-funded studies. This chapter checks whether the IDB-funded studies contain the information as asked for in the ToR. Chapter 2.2 thus focuses only on comments and recommendations at activity level and impact level (refer Figure 1), as comments on the project level and solution level already have been made in chapter 2.1.

Appendix 5 provides some technical and methodological remarks on the IDB-funded studies.

Chapter 3 comments on the studies of the independent Panel of Experts (the Panel) and the NGO's study. In chapter 5 the conclusions of the Commission are summarized.

Appendix 3 gives an overview of the documents consulted by the Commission for the review advice.

2. COMMENTS ON THE TERMS OF REFERENCE FOR THE IDB-FUNDED STUDIES AND REVIEW FINDINGS OF THE IDB-FUNDED STUDIES

2.1 Comments on the ToR for the IDB-funded studies

2.1.1 General observations

Módulos A and B1 deal with the study of the technical and economic/financial feasibility of the improvement of the Paraguay/Paraná Waterway. The ToR for A and B1 are sufficiently specific for the intended purposes. Concerning environmental impacts, however, they only deal with the direct impacts of the designed activities.

The overall environmental impacts of the Hidrovía project are being addressed through Módulo B2. The ToR for Módulo B2 clearly indicate that direct as well as indirect impacts have to be taken into account, with special reference to the induced agricultural and other economic and social developments that may result from the project. They specify the need to develop alternatives at activity level and if necessary mitigation measures on various issues. The ToR for Módulo B2 however are generic and apply to every infrastructural development project calling for an EIA. Although very extensive, they lack scoping on issues that are essential for decision-making. In general, all three ToR are limited in their scope of social aspects, land use and cultural-anthropological aspects.

When compared to generally accepted guidelines for adequate EIA to be applied to the preparation of this type of infrastructural development projects, it can be concluded that the Terms of Reference:

- are not embedded in a description of the rationale of the proposed activity;
- are thus limited with respect to objectives and scope of work;
- do ask for an environmental diagnosis to serve as a baseline reference for evaluation of impacts, but do not explicitly ask for a description of the autonomous development of the region;
- do not require the evaluation of, and comparison with alternatives at project level;
- do not identify gaps in knowledge and its consequences for the decision making process.

As a consequence, the studies do not answer questions related to:

- the justification for the decision to enhance economic development in the area by expansion of mechanised soybean culture and exploitation of mineral resources;
- alternative transport corridor routes: (i) Tocantins-Araguaia Waterway, (ii) Madeira-Amazonas Waterway, (iii) Santa Cruz de la Sierra-Corumbá railroad, etc. It only looked into the effects of the Ferronorte railway;
- the possible cumulative and long term impacts as a result of other projects, scattered throughout the project area at various stages of implementation or in the pipeline (as identified and charted by the NGO's study).

The main shortcomings of the IDB-funded studies can be traced back to the fact that the problem analysis and formulation of objectives as well as the development of alternatives at project level have not been elaborated in the ToR's. This leaves room for speculation as to what should have been addressed in the IDB-funded studies. It may well be that problem analyses and project alternatives have been considered during the preparation of the Hidrovía project by the CIH in the past years. However, decisions on these matters are not explicitly made, therefore generating considerable doubts and criticism by the general audience and more specifically the NGO-community. The following paragraphs will elaborate these issues.

2.1.2

Rationale of the proposed activity (*level 1; solution alternatives*)

No background information is provided with the ToR or with earlier documents on the present socio-economic situation in the study area, nor a description of development trends or alternative scenarios. Therefore it is not possible to clearly understand the justification of what seems a premature selection of the Hidrovía project as a (preferred) means to “develop production in the region as well as trade” without a comparison with possible other scenarios.

Concerning the problem analysis, the background description of the ToR does mention that the river system is deteriorating due to institutional and economic causes, which has resulted in a reduction in works such as maintenance dredging to improve navigation. More specifically, the ToR refer to subsidized road transportation in the subregion which negatively affected river transportation in the recent past.

The Commission agrees with the Panel that a more general and integrated EIA of the socio-economic development of the study area should have been the basis for deciding whether or not to enhance such economic development. This strategic EIA could have provided insight into the environmental impacts associated with the expansion of mechanised soybean culture and exploitation of mineral reserves as compared to other development scenarios. The strategic EIA could also have revealed whether the economic development of the region is mainly hampered by transportation problems in the region or whether other problems should be solved first or simultaneously.

! The Commission therefore recommends that additional information be provided by the CIH which gives insight into the decision making process: which arguments (of developmental, economic, financial, political, environmental and social character) determined the selection of the Hidrovía project as the most sensible solution to the problem of hampered economic development in the region? The justification for the Hidrovía project as the preferred solution for economic development should be placed within a wider perspective of regional development and, ideally, within the framework of an Integrated Regional Development Plan, possibly in tandem with a Strategic EIA for this Plan. Such a plan should incorporate all development projects, (those already implemented, in the pipeline and under consideration) that will have an impact on the Pantanal and Chaco-ecosystems and some of which will use the Hidrovía transport corridor. For instance, crucial for the justification of improvement of the Hidrovía upstream of Corumbá is Brasil’s development strategy for Mato Grosso and Mato Grosso do Sul, particularly in respect of processing and transportation alternatives within the country to address increased production in these regions. Also a precise understanding is needed of the implications of Brasil’s warning to avoid any negative impacts on the Pantanal wetland and its global importance for biodiversity. Another example concerns a project mentioned in the NGO’s study, i.e. the construction of a dam in the Alto Paraguay river, at Puerto Caballo near Bahía Negra, for irrigation purposes: if this were a project in the pipeline, it would affect the Hidrovía but this project is not considered in the IDB-funded studies.

An integrated regional development plan and its corresponding Strategic EIA will provide useful tools to assess environmental impacts of individual projects. The importance of such a plan is evident when considering that the Hidrovía transport corridor will support and possibly accelerate the existing development plans for the area.

2.1.3

Proposed activity and alternatives (*level 2; project alternatives*)

Given the number of projects in various stages of development in the region, it can be assumed that significant socio-economic development is taking place.

The Commission is of the opinion that the proposed project deals with a restoration and improvement of the transportation and communication function of the waterway, and not with a

change of function of the river. Based on this assumption, and given the arguments in the preceding paragraphs that explain the difficulty to assess which parts of development can be attributed to the Hidrovía and the expectations of its improvement, and which development is taking place autonomously, the Commission is of the opinion that the Hidrovía is probably the most attractive solution to provide a low cost transport mode. However, no analysis of alternative transport modes has been asked for in the ToR and hence has not been analysed in the IDB-funded studies. A proper comparison to discard other modes is therefore lacking. Assuming that potential cargo will be available, and that distances are comparable, in general river transport is the preferred transport mode, as compared to road and rail. Transport costs are lower, the impact on the environment is less and river transport is more energy efficient. As compared to the alternative corridors, the Hidrovía can be implemented soonest, requires the least investments and is the most flexible.

Alternative solutions have been identified and assessed for the upstream part of the river: (i) use/impact of Ferronorte, (ii) road/rail transport and port at Murtinho instead of the development of the Hidrovía from Murtinho to Cáceres.

! The Commission recommends that additional information be provided by the CIH which indicates which alternative corridors have been considered, and justifies the selection of the Hidrovía Waterway as compared to other transport corridor routes, taking into consideration especially environmental aspects.

Additionally, the Commission recommends to study other alternatives for the upstream part of the Hidrovía, i.e. the section that directly or indirectly affects the Pantanal wetlands. A feasible alternative might possibly limit the extension of the Hidrovía project in an upstream direction, thus limiting induced socioeconomic development and hence the risk of irreversible negative impacts on the Pantanal ecosystems.

2.2 Findings of the review of IDB-funded studies

2.2.1 **General**

As the ToR did not provide nor ask for the general and integrated rationale for the project, the rationale for the project studied in the IDB-funded studies was limited to the (transport) economic^{6]} and financial justification of the project. Moreover, the Commission feels that environmental considerations did not play an explicit role in the design of the project. This is reflected in the insignificant cost estimate related to mitigating measures. Most of these costs are related to environmental monitoring only.

2.2.2 **Alternatives at activity level (*level 3; alternative activities*)**

The ToR specifically require investigations into different alternatives, that have to be detailed per river section. Alternatives cover different aspects such as the design of the navigation channel, the envisaged use of the waterway (e.g. size of barge convoys, one-way traffic options), the activities during the construction phase, and the siting of dredged spoil disposal sites. If negative impacts are still to be expected, mitigation measures have to be developed and monitoring of environmental impacts is required.

The Commission understands the rationale that the IDB-funded studies did not evaluate other engineering alternatives such as the construction of dams (discharge regulation), weirs and locks (canalization) or channel control (normalization), as the proposed engineering method is the alternative that requires minimal and marginal measures to be taken to improve the navigability of the river system.

The Commission is thus of the opinion that all relevant and realistic alternatives at activity level have been covered in the ToR.

In the IDB-funded studies, alternatives (dimension of channels) have been calculated from a transport economy point of view (28 alternatives, 7 widths x 4 depths). This formed the basis for the final selection of alternatives that would be further elaborated. Only after the choice for the final alternative had been made, were the environmental impacts assessed. This limits the possible influence of an EIA to mitigation measures only.

! The Commission observes that environmental considerations did not play any role in the definition of alternatives and the design procedure. Apparently, environmental impacts have been identified as being minimal, but the Commission feels that substantial improvement of the assessment is necessary, especially at specific sites where mitigating measures are required and those sites where rocks will be removed.

2.2.3 **Impacts and mitigation measures (*level 4; prevention, mitigation, compensation*)**

Physical environment

Although non calibrated one-dimensional models have been used to establish a relation between river level and flooded area (Thomas Dunne of the Panel of Experts and Stephen Hamilton), the estimated impacts of the dredging works (if carefully carried out) on the upstream water levels (and the Pantanal) are probably correct as an order of magnitude. It is also true that this impact is very small (less than 5-10 cm as indicated in the IDB-funded studies) compared to the natural

⁶ The Commission has some critical remarks on cargo projections and transport economy (appendix 4).

hydrological variations (compare e.g. the multi-annual variations of 2 meter due to the sequence of wet and dry years and the annual seasonal variations of 4 meter).

As Stephen Hamilton (whose methodology was used) states that the impacts of both Módulo A and B on the Pantanal can regionally be much more severe than stated by the IDB-funded studies, additional information should be provided by the consultants to substantiate their conclusion that impacts would be negligible. Moreover, the Commission is of the opinion that two other reasons can be given for prudence with interventions in the riverbed in or immediately downstream of the Pantanal: (i) there is a serious lack of data of the most sensitive stretch through the Pantanal and (ii) the Brazilian government has issued a statement which puts severe restrictions on physical interventions in the riverbed inside the Pantanal.

! The Commission recommends that CIH provides an estimate of the area affected under a hypothetical higher impact of river level changes, to be able to judge whether the impacts are alarming (according to the Panel) or small as compared to the effects of the natural annual and multi annual hydrological variation in the same area. This additional information might give more insight into these apparent inconsistencies. The Commission advises that the CIH adopts the precautionary principle in its broadest sense: no interventions unless there is evidence that impacts (related to flood frequency and duration) on the Pantanal and other vulnerable areas will be minimal. The Commission especially recommends a more detailed analysis for the Corumbá-Cáceres part and the part downstream of Corumbá which might through backwater-effects influence the Pantanal.

The more structural water and bed level changes to be expected may be due to rock blasting activities. The IDB-funded studies indicate that the volumes of rocky outcrops to be removed are very modest, but are not specific on details. It is essential to know the geomorphological situation and the precise location and volumes of the blasting activities in order to evaluate their upstream impacts.

! The Commission recommends that CIH commissions an additional geological and geomorphological study, on the basis of which the needs for removal of rocky outcrops can be identified and its (upstream) impact of water level and bed level changes can be assessed.

Socio-economic environment

The ToR explicitly mention that the IDB-funded studies must consider the benefits associated with the development of the region, and the effects on low-income groups measured by the analysis of distributional impact. This has not been done. No poverty baseline study was carried out. In general, quantified data on population (locations, growth, migration, poverty,...) are hardly presented in the studies.

Impacts on local communities are viewed on their possible negative effects. No options are proposed on how these communities can benefit from the project.

The ToR for Módulo B2 state that the environmental diagnosis must describe the current environmental situation of the areas reached by the undertaking and its impact on the physical, biotic, socio-economic and cultural aspects. This will allow the region to be known before the work is implemented, and will serve as a baseline reference for evaluation of the impacts produced by the construction of works and the operation of the Hidrovía. However, a baseline survey is not presented in the studies: in fact most of the information gathering and analysis seems to be placed under the proposed mitigating programmes to be undertaken with the project (and not before).

In the ToR concerning study of land use and current use, or the study of impact on human communities, no reference is made to the need for an analysis of land tenure and land speculation problems. It is thus not surprising that the studies do not refer to such problems. As the NGO's study gives examples of some cases of land speculation and violation of rights of indigenous communities, the Commission is of the opinion that the existing and potential problems in land tenure and access right should have been given attention in the IDB-funded studies.

Task of the IDB-funded studies was also to propose measures for averting and mitigating adverse impacts and permitting recovery and conservation of the environment and natural resources, through a set of specific programmes. Among the programmes on Human Environment, it was requested to elaborate (among others) specific programmes for: (i) the control of land use; (ii) control of internal migration to the area; and (iii) expropriation. These programmes were not prepared, but instead a subprogramme is proposed of data collection and analysis, which includes socio-demographic research. The consultants mention that they were faced with lack of freely available and updated information concerning the socio-demographic variables related with the non-indigenous population living along the river. The NGO's study however does provides this data for certain areas.

Direct effects of the use of Hidrovía (risk of accidents, river pollution by barges and port activities, etc.) are hardly covered.

Although in some parts of the IDB-funded studies it is acknowledged that the Hidrovía will induce growth of agricultural exploitation and forestry in its area of influence, the consultants argue that also without the Hidrovía project the agricultural frontier has expanded spectacularly in the past 20 years and therefore choose not to consider land use changes along the waterway nor increased soybean cultivation and mining in Mato Grosso and Santa Cruz as being induced by the project. By doing so, they feel justified in their decision not to take such (induced) effects into account in the EIA.

Projections of land use changes are used in a model to predict the hydrological behaviour in the catchment. The Commission has the impression that medium- and long-term effects of soybean cultivation (soil compaction, reduced infiltration rates, higher run-off) may increase the drainage density and the peak flows in the upper stretches of the rivers, and that such effects are not properly included in the model used.

Research shows, according to the IDB-funded studies, that the Pantanal acts as a sediment trap. Increased human activities are seen as increasing sediment runoff. No research has been done at all into increased sedimentation in the Pantanal due to the autonomous developments. Although this autonomous development has no direct relation with the Hidrovía, the IDB-funded studies ignore that the improvement of the Hidrovía will have an accelerating effect on the development of the soy bean culture.

! The advice of the Commission is to request the CIH to provide supplementary information on the above mentioned socio-economic effects. The Commission recommends specifically that an ex-ante evaluation be realized to identify sites where land speculation takes place along the Hidrovía and in its area of influence and what the situation is concerning land titles in those areas.

COMMENTS ON THE REPORT OF THE INDEPENDENT PANE OF EXPERTS AND THE NGO S STUD

3.1 Panel of Experts study

In the preceding chapters the Commission already made reference to some remarks of the Panel. In addition the Commission has the following observations.

The Panel is correct in putting the project in a broader development perspective.

The Panel compares the Hidrovía project with other large scale projects previously carried out (Polonoroeste, Carajás, Itaipú, Yaciretá, the Trans-amazonic highway (BR230), the Cuiabá-Porto Velho road (BR364), and points out their failures. In the view of the Commission the Hidrovía project cannot be compared directly to any of the projects mentioned, as the investments required and environmental impacts are different. However, if care is taken not to transpose lessons from one project directly to another, it is relevant to learn from lessons in other large scale infrastructure projects, especially with respect to the induced effects on economic development and social changes.

The Panel's report fails, however, to make a proper distinction between national and regional development objectives and the specific objectives of the Hidrovía project. This leads to broad comments in which all social problems in the region are related to the Hidrovía, while the issue at stake is a problem which refers to a number of South American societies, e.g. the marginal position of many indigenous groups. Most projects aimed at economic development in a broad sense can be accused of widening the poverty gap. The question is whether all projects should be beneficial for marginal groups. This is a political decision which has to be made on a national level and goes beyond the scope of the present project. In general, negative impacts on these vulnerable groups should be avoided as much as possible and compensated for if any occur.

It is agreed that the Hidrovía study ignores possible indirect and cumulative impacts. The Panel, however, confuses overall development goals for the region with the implementation of one aspect related to the development of the region, i.e. providing adequate, cheaper and reliable transport. They mix up the strategic and project level alternatives. The Panel should have made a distinction between regional development goals (strategic), which should have been defined in a regional master plan for economic development, and the position of Hidrovía within this context (project). Since such a master plan is lacking, the Panel would then have been able to direct its criticism at the proper level, i.e.:

- the responsible authorities and the IDB for not putting the project in a broader development - perspective;
- and the consultants for not properly dealing with the impacts generated by the project.

It should be noted that the more severe negative impacts on the biotic and anthropic environment are associated with the economic development in the area and not with the Hidrovía project itself.

The Panel correctly stresses that the studies show gaps in information, rely on very limited information and present an optimistic view on magnitude of the impacts which is not substantiated by reliable data and analyses.

For comments on hydrology models, see section 2.2.3. It is important to have information on the change in flood frequency and duration of critical areas in the wetlands, taking into account the natural annual and multi-annual variations to be expected. The Panel is the first to mention the Chaco wetlands and the possible effects on these wetland if the hydrological modelling may prove to be wrong. This aspect has not been addressed by the IDB-funded studies.

The relation to global climatic changes is far fetched, again since this is a matter of national and even international political fora.

Comments on the EIA: the Panel correctly stresses the multifunctional character of the wetlands and their vulnerability to small changes in their hydrological regime. This refining of wetland values for

human society shows that the IDB-funded studies are lacking detailed information which is available in the region. The analysis of the IDB-funded studies could have been more substantial in many aspects.

Social aspects: the Panel correctly stresses the lack of participation of local communities, thus rendering the mitigation measures possibly insufficient. Social acceptance of the project is therefore not ensured.

Economic analysis: the Panel's report clearly explains why the (expansion and intensification of) soya culture should be an integral part of the economic and thus environmental analysis.

The Commission agrees with the criticism on the exclusion of alternative transport options (see section 2.1.3 of this review advice).

When the Panel returns to the overall development goals in the region the comments again go far beyond the scope of the Hidrovía project and refer to general policy making for all countries involved. For example, it is unrealistic to state that community based eco-tourism can be a valid alternative to activities related to the Hidrovía, such as iron ore mining. It concerns totally different sectors of the economy. Furthermore, the example of sustainable tourism (often promoted as the saviour of all natural areas in the world) gives room for new discussions since it has a limited market and can have serious social and environmental impacts (as can nowadays be seen inside the Pantanal).

! The Commissions overall opinion on the report of the Panel is that they mix criticism on the CIH with criticism on the IDB-funded studies. Many of the critical remarks have no direct relation with the Hidrovía project. However, a large part of their comments on the IDB-funded studies are valid and the issues raised merit further study. Their suggestion to limit interventions, for the time being, to measures without physical effects (e.g. signalisation) and furthermore develop an integrated plan for the development of the region, taking into account the needs and capacities of the local people, makes sense. The Commission agrees with the Panel that a sensitive internationally acknowledged ecosystem as the Pantanal wetlands merits a more detailed analysis of the potential impacts than what is reflected in the IDB-funded studies. The Commission also agrees with the Panel that a gradual, phased and well monitored approach is recommended.

3.2 NGO's study

3.2.1 Contents on the summary

It appears that a very large quantity of relevant information has been gathered by consultants and local NGO's, but that the summary does not clearly distinguish between factual presentation of information and the writing of highly biased, manifest-like texts, not substantiated by data or other forms of evidence. The summary contains a 2 page introduction fulminating against capitalistic economic practices in South America, followed by a similar 4 page criticism on the Hidrovía project. The description of the area does not give any detailed information on ongoing and planned projects. The summary does not make reference to the main report for more detailed analysis or substantiation of issues or comments.

The 4 page chapter on development of alternatives contains very broadly defined development options, which have general validity for a poverty alleviation programme in rural development context. It does not touch upon the needs of, for example, poor urban groups or the needs for general economic development on a national or international scale. The document very firmly sticks to the needs of the poorest rural groups in the region.

3.2.2

Main text

The main text of the NGO's study is composed of different volumes, one each for the countries Brasil, Bolivia and Paraguay. Three maps are added. The main text does not refer directly to those maps. The country documents of the NGO's study provide an extensive list of projects in the area of influence of the Hidrovía. The descriptions of these projects are not evenly balanced in their detail and often it cannot be judged in what stage of progress a project is (e.g. the dam and irrigation project located at Puerto Caballo - Paraguay).

Browsing through the extensive documentation relevant information organised per country can be found relating to:

- physical, social and archeological description of the area;
- past and present development policies in the Alto Paraguay basin;
- present day economic activities: for example, soya cultivation in Mato Grosso has from 1980 to 1993 increased from 50,000 ha to 733,000 ha, i.e. a 1190% increase. This kind of information is important to take into consideration in relation to the autonomous development in the area.
- projected projects in the basin with present status and possible environmental and social impacts. For example, 13 hydro-electricity projects are projected in the upstream reaches of the Paraguay and its tributaries, which have not been mentioned in the IDB-funded studies. Other interesting details are revealed: e.g. the dredging works already going on in the Tamengo Canal in Bolivia in spite of the agreement between the 5 countries to await the outcome of the IDB-funded studies and the mining activities in Mutún being halted since 1972 due to transportation problems with Hidrovía.

Since the underlying documents are obviously produced by a number of different persons with relevant experience in the countries concerned, these documents lack coherence and have different styles and presentations. Therefore, the role of final editing is important in order to produce a coherent and accessible document. Since this is not the case, the wealth of information remains to a large extent hidden in the 1000+ pages of the documents.

3.2.3

The maps

The maps provide a general picture of the Paraguay-Paraná river basin with information on general environmental impacts, projects (on-going, in the pipeline, or in identification stage), and on indigenous communities and their territories. These maps are a welcome addition to the IDB-funded studies.

The maps help to summarise some of the information, but in a very general way and not doing justice to the detail of some of the information in the documents.

However, as hardly any maps on the region can be found the endeavour of the NGO coalition was a difficult one. Nevertheless, some remarks should be made: information is mainly collected from secondary sources of information (other maps, government services, etc.). This results in a lack of detailed information on, for example, the Pantanal area. Collection of data in the field and/or field checks were limited. It is realised that the area is of enormous magnitude and data are difficult to obtain, but some remarks on the reliability of the information are required.

The reason to map archeological sites in relation to the Hidrovía is not clear to the Commission. The endeavour in itself may, however, be useful since apparently there is no overview of these sites.

The concentration on indigenous communities is inappropriate, since they represent a small proportion of the population, while many other groups are also anxious about the influence that the Hidrovía might have. The main document does make a distinction between indigenous and traditional communities, the latter being those people that throughout their history have relied on

the natural resources of the region, and nowadays being strong advocates of safeguarding the natural environment on which they depend. The summary and the maps do not pay attention to these people. Considering the 'others' as being invaders of European origin, and implicitly not taking these groups into account, is beyond present day reality.

The vegetation map contains little detail and it looks like vegetation communities vary along country borders. Apparently, there was little inter-country coordination. Similarly, environmental problems aggregate per country, probably resulting from different names or perceptions of the problem. E.g., according to the maps deforestation is omnipresent in Paraguay and not in Bolivia and Brasil.

- ! The Commission would like to summarize her comments to the following. The NGO's study emphasizes the risk of the regional and national development models being supported by the Hidrovía project and the negative consequences for the poorer segments of the rural population including the indigenous groups. The development models are in favour of export of commodities from large-scale agricultural production. The NGO's study would rather seek promotion of small and medium-sized production for the regional markets. The Commission is of the opinion that the discussion on appropriate development models is beyond the scope of the studies for the Hidrovía project. The NGO's study has added value because of the information presented on many projects of relevance for the Hidrovía. A useful roll of the members of the NGO-coalition has been the awareness campaigns toward the local population and the efforts of involving them in the decision-making process for the Hidrovía. The Commission recommends that additional funding be provided to rewrite the summary and the conclusions at the end of each chapter, in order to make the underlying useful information, often additional to the IDB-funded studies accessible and readable. Editing by an independent consultant would be preferable.

MAIN CONCLUSIONS

4.1 General remarks

The conclusions in the following paragraphs are also meant to deal with the questions mentioned in the letter of the NEDA on the Hidrovía project. The Commission has felt the lack of a broader framework in the present documents (IDB-funded studies) as a limiting condition for a proper judgement of the possible negative effects of the activities of the Hidrovía project.

4.2 Quality of the IDB-funded studies and its ToR's

4.2.1 **Terms of reference**

The Terms of Reference are not embedded in a description of the rationale of the proposed activity and are thus limited with respect to the scope of work. A justification for the selection of the Hidrovía project as the best means to stimulate production in the region as well as nonregional trade is therefore not provided. Although it can be argued that the proposed project deals with a restoration and improvement of the transportation and communication function of the waterway, and not with a change of function of the river, there is insufficient attention to the rationale and to previous strategic development decisions by the different governments involved and hence room for criticism on strategic issues which may be beyond the scope of the Hidrovía proposal.

As far as environmental aspects concerned, the ToR for the feasibility studies only deal with direct environmental impacts. The ToR for the environmental assessment is very generic and lacks scoping on issues which are essential for decision making.

4.2.2 **The IDB-funded studies**

Justification of the project

The justification for the project is provided from an economic perspective, primarily justified by transport of minerals and soy beans/products and does not convince. Environmental considerations did not play an explicit role.

Environmental impacts

The predicted hydrological effects of the Hidrovía works on the Upper Paraguay river, including the Pantanal are based on limited data. Potential impacts on the hydrological regime of the Pantanal wetlands have been identified as insignificant but the Commission could not find any substantiated evidence for this statement in the IDB-funded studies. Since the Pantanal performs crucial functions with economic as well as social values, and since it is the world's largest freshwater wetland ranking among the most biologically diverse ecosystems, any potential negative impact merits detailed analysis. The precautionary principle should be applied in its strictest sense.

Socio-economic impacts

The IDB-funded studies did not describe impacts on low-income groups through an analysis on distributional impact. There is no baseline survey, which makes it impossible to judge whether there are any negative impact on the local population.

Induced impacts

Direct impacts have been described into (sometimes too much) detail, whereas induced impacts are not addressed. An example is the soybean cultivation, which is a rapidly expanding economic activity which has rather severe environmental impacts itself, i.e. deforestation, soil degradation and pollution.

These impacts in return will have long term effects on the Hidrovía watershed, such as increased sedimentation and pollution. By providing a cheaper means of transportation, the Hidrovía may enhance expansion of soybean cultivation (the latter issue is ignored by the IDB-funded studies), thus intensifying the environmental degradation process in the soybean expansion region.

The development of a reliable permanent waterway for low priced bulk commodity transports will inevitably lead to induced economic development along this waterway. This will express itself in the first place in port development, but in the second place also in land encroachment and speculation along large parts of the Hidrovía, especially in those areas that formerly were difficult to reach, such as the upper reaches of the Paraguay river. It should, however, be recognized that the development of any alternative mode of transport for the evacuation of the estimated volumes of soybean/products and minerals is likely to produce more adverse impacts in the region.

Mitigating measures

Mitigating measures for environmental impacts are limited to monitoring only, which is according to the Commission not realistic and insufficient. Whereas the ToR demand a number of programmes to be developed for averting and mitigating socio-economic impacts, no such programmes were prepared.

4.3 Added value of the report of the Panel of Experts and the NGO's study

4.3.1 **Report of the Panel of Experts**

The Panel of Experts has correctly pointed out that the IDB-funded studies show serious flaws, but does not separate in a systematic manner its discussion of the overall development goals of a region with its discussion of the consultants' studies on the Hidrovía. When dealing with regional development, their study has been useful in this respect, because it showed the evident lack of a regional development plan. However, their remarks that deal with the strategic level could be considered as being beyond the scope of the Hidrovía project.

As far as their criticism towards the contents of the IDB-funded studies, they mention valid arguments to question the quality and conclusions of these studies. Especially their comments on the projected soybean production is shared by the Commission. In the Panel's analysis soybean production could either expand or contract.

The justification in the IDB-funded studies does not convince. The Panel also questions the analysis on the impact on the hydrological regime as reported by the consultants. The Commission agrees with the Panel of this issue. Finally they correctly note that the IDB-studies do not properly incorporate the full costs of mitigation measures.

4.3.2 **NGO's study**

The study contains a lot of useful information which was not found in the IDB-funded studies. The most valuable parts are: (i) past and present development policies in the Alto Paraguay basin, (ii)

present day economic activities, (iii) projected projects in the basin with present status and possible environmental and social impacts and (iv) indigenous communities and their territories.

Also their role in awareness raising towards the Hidrovía project among the local population is a valuable one.

Unfortunately, the wealth of information lacks a professional analysis. The presentation of the information would have benefitted from better editing of the three separate studies and integrating the results into one report (or a summary reflecting the contents of the underlying studies).

4.4 Contradictions and conflicts of interest

The Commission would like to mention in this paragraph that a lot of contradictions can be found, but these have to be attributed to the different visions and ideologies of the parties involved. The consultants performed their tasks according to the ToR's, whereas the Panel and the NGO's had their own mission and objectives.

The Commission can pinpoint two contradictions based on factual information:

- predictions in the development of the soybean production and;
- different expectations of the impacts due to the changes of the hydrological regime.