Netherlands Commission for Environmental Assessment

Advice on Terms of Reference for SEA Vivir con el Agua

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Bolivia

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Netherlands Commission for
Environmental Assessment

your reference

your letter

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Viceministerio de Recursos Hídricos y Riego
To: Sr. Viceministro Carlos Ortuño
La Paz, Bolivia

Date: *1 December 2011*
Subject: *Advice on Terms of Reference for SEA Vivir con el Agua*

Dear Mr. Ortuño,

In June 2011, you requested the Netherlands Commission for Environmental Assessment to advise on Terms of Reference for an SEA for the Vivir con el Agua program.

It is my pleasure to submit herewith the Advice on Terms of Reference prepared by a working group of the Commission. I would like to draw your attention to the following:

First of all, I would like to express my appreciation for the organisation of the visit and the personal interest demonstrated by yourselves and staff of your Vice Ministry. This has allowed the Commission to receive a wealth of information in a short period of time.

As has already been presented to you during the de-briefing at the last day of the Commission's visit, this SEA has some specific characteristics. The SEA linked to the 'Vivir con el Agua' program thus does not assess the consequences of the program itself. It moreover uses the program as a 'vehicle' to develop an SEA process which pro-actively assists in the development of plans and project developments under the 'Vivir con el Agua' program. In stead of reacting to an existing plan through an assessment, the SEA in this case contributes to a more explicit description of the plan, based on a vision of sustainable development in the region.

At the debriefing we also discussed that a two-year period is expected to be too short for the 'Vivir con el Agua' program to reach its objectives and to become a sustainable continuous process. By following the 'Vivir con el Agua' program, the SEA gets a, so to speak, 'flying start', making use of the available program activities, but having an impact well beyond the time horizon of the program, as it may effectively influence the departmental and municipal planning processes.

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These plans have a much longer time horizon. The challenge will be to give due follow-up to the first steps in the 'Vivir con el Agua' program and consider possibilities to assure continuation.

Given the hydrological conditions of the Beni lowlands, the strategic vision of the 'Vivir con el Agua' program is focussed on a living with water approach, accepting the seasonal floods and droughts as an unavoidable fact of life in the Beni. Therefore, I would like to emphasize that also the Commission, like the 'Vivir con el Agua' program, has focused its Terms of Reference for the SEA on options *to adapt* to the situation and opportunities for the area to be enhanced. Measures *to prevent* the floods in the Beni lowlands seem virtually impossible. If any, these measures lie mostly outside the Beni area (Cochabamba and Santa Cruz), will be rather complex to construct and very costly and seem in no comparison with the number of inhabitants and economic value in the Beni area. A better regulation of the discharge towards and within the Beni floodplains will not prevent the area from flooding. Even more importantly, flooding is already part of the system for thousands of years, is the life-line of the area, essential for maintaining the productivity of the area (pastures, fisheries etc.).

The Commission recognizes that particularly for the hydrological aspects, the Beni lowlands cannot be seen in isolation. Linkages with the Santa Cruz department exist and also the construction of the hydropower dams in the Rio Madera in Brazil could have an extra impact in future on the extremes of flooding in the area. For the moment, these developments fall outside the scope of this particular advice of the Commission, but again emphasize the importance of adaption to the consequences of the extremes.

During our visit, we also observed some difficulties in communication between the Vice Ministry at national level and departmental government in the Beni. Therefore I would like to stress the importance of the subsidiarity principle as leading in the 'Vivir con el Agua' program. This implies implementation of activities and availability of required means at the lowest possible organisational level, striving towards maximum (local) ownership. I would therefore recommend the instalment of a Steering Group for this SEA, in which representatives of your Vice Ministry participate, together the representatives from Beni Department and the Vice Ministry of Environment, Biodiversity, Climate Change and Forest Development.

Finally, as this SEA approach is relatively new and differs significantly from a classical SEA, this puts some specific requirements to the SEA expert. He/she has to be full time available to continuously provide information at the appropriate moments. The SEA expert therefore needs to be a senior, respected 'heavy weight'. The Commission is willing to provide coaching support to this SEA expert at certain moments during the implementation of the SEA. A first possibility for this could for instance be reviewing a work plan developed by the SEA experts, during the inception phase of the 'Vivir con el Agua' program.

I would appreciate to be kept informed on how you will use this advice on Terms for Reference for the SEA and wish to express once more our availability and offer to continue co-operation with your Vice Ministry in the next stages of this SEA for the Vivir con el Agua program.

Yours sincerely,

Rudy Rabbinge

Chairman of the Working Group on SEA Vivir con el Agua, Bolivia

cc.

Vice Ministry of Environment, Biodiversity, Climate Change and Forest Development
Ms. Cynthia Silva
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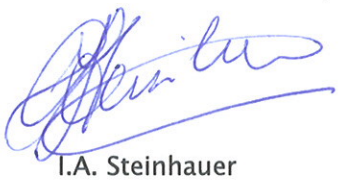
Advice on Terms of Reference for SEA
Vivir con el Agua - Bolivia

Advice submitted to the Viceministerio de Recursos Hídricos y Riego,by a working group of the Netherlands Commission for Environmental Assessment in the Netherlands.

the technical secretary



I.A. Steinhauer

the chairman

R. Rabbinge

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1. Introduction

1.1 Background

The Beni lowlands in Bolivia are characterized by seasonal floods. In El Niño years the floods are more severe, with greater quantities of water and/or over a longer time span. In La Niña years, the floods tend to become shorter or less intense). This process of periodical flooding occurs already since prehistoric times when the early inhabitants (Moxos) adapted to this situation by building special constructions (a.o. 'Lomas' and 'Camellones') that can still be recognized in the landscape. Seasonal floods have created the Beni lowlands and are essential for their functioning (e.g. by depositing fertile sediments and recharging groundwater aquifers).

However, extreme floods can cause problems, resulting in social distress and economic loss. In 2008, the city of Trinidad was about to be flooded and in 2007, 40.000 heads of cattle were lost. Other problems are related to negative effects on the economy, the urban and rural population, health, the economic and social infrastructure (see appendix 4 for a map of the area).

As a result of climate change, it is expected that these floods may intensify and most probably last longer within the near future. Together with increased human activities it can be expected that the impact of the floods will cause more and serious problems for the further economic development of the Beni lowlands. On the other hand, in the dry season, droughts are becoming more prominent in the region, with greater risks for agricultural and livestock production and domestic water supply. Droughts result in an increased risk of savanna fires due to pasture management practice and forest fires as part of shifting cultivation agriculture.

This situation not only requires emergency plans, contingency plans and reconstruction projects, but also a strategy of adaptation and mitigation to be implemented before disasters occur. This strategy is being developed through the 'Vivir con el Agua' program. This program consists of several components intended to start a series of activities and interventions parting from the point of view that waters cannot be stopped and that only a 'Living with Water' approach is realistic. The program counts with financial support from Netherlands and Belgian development co-operation. The components are:

- Development and implementation of a state-of-the-art early warning system for the Río Mamoré water basin, based on hydrologic modelling.
- Update and improvement of the Regional Spatial Plan for the middle water basin of the Mamoré river, based on hydrological conditions, flooding risks, hazards and vulnerabilities.
- Drafting of municipal flooding risk reduction plans in 3 municipalities: Santa Ana de Yacuma, San Ignacio de Moxos and Loreto

- Validation of the ancient hydro-agricultural structures of the Moxos culture under various hydrological conditions.
- Inventory and study of functional aquatic ecosystems and identification of potential Ramsar sites
- Coordination, monitoring and evaluation of the program.

As part of the National Watersheds Management Plan (Plan Nacional de Cuencas) in Bolivia, the Vice Ministry of Water Resources and Irrigation (VMRHR) of the Ministry of Environment and Water is responsible for the coordination of the program 'Vivir con el Agua'. All components with a specific link to the Beni will be executed through regional and local government and/or organizations.

The Vice Ministry has taken the initiative to undertake a Strategic Environmental Assessment (SEA) in relation to the Vivir con el Agua program.

1.2 SEA in Bolivia, involvement of NCEA and request of VMRHR

The Ministry of Environment and Water is the National Competent Authority for Environment and has a formal role in terms of introduction and implementation of SEA in Bolivia (through the Vice Ministry of environment, biodiversity, climate change and forest development). These efforts started in 2004, under the former Ministry of Sustainable Development. The Netherlands Commission for Environmental Assessment (NCEA) contributed to several SEA initiatives[1] upon request of the Ministry.

Late June 2011, the Vice Minister of Water Resources and Irrigation approached the NCEA (see appendix 1a for letter with request) to assist with advice on strategic environmental aspects and strategic planning for the Vivir con el Agua program. In a response letter (see appendix 1b), NCEA proposed that the advice would be shaped in the form of a Terms of Reference (ToR) for an SEA, thus guiding and improving strategic planning and at the same time complying with Bolivian legislation[2], which requires SEA for this type of programs and plans. This proposal was agreed upon by the Vice Minister (see letter in appendix 1c).

1.3 Expert working group and scoping mission

This advice is prepared by a working group of experts of the NCEA. The group represents the NCEA and comprises expertise in the following disciplines: aquatic ecosystems, wetland management, ecosystem services, natural resource management, socio-economic development, integrated water management, water safety and risk management, land use planning,

[1] - Advice on Terms of Reference SEA Polo de Desarrollo (Puerto Busch), Bolivia, 30 September 2004
- Supplementary Advice on Terms of Reference for SEA Polo de Desarrollo (Puerto Busch), Bolivia, 4 February 2005
- Advice on Terms of Reference for SEA Gran Salar de Uyuni, Bolivia, 24 December 2004
- SEA capacity building 28 February-5 March 2005
- Advice on Terms of Reference SEA for the Madera river basin, Bolivia, January 2008
- SEA capacity building workshops in La Paz and Cochabamba, May 2008
- Comments on an SEA capacity building manual and draft SEA regulations (2007-2008)
- Advice on Terms of Reference SEA oil and gas exploration, Madidi/Aguaraguë (2009)

[2] SEA regulation, according to Environment Lay no. 1333

and EIA and SEA application. The composition of the working group can be found in Appendix 2.

For the preparation of this advice, the working group visited Bolivia from 3 – 9 of November 2011. During this period, the working group visited stakeholders in La Paz, Trinidad, Santa Ana de Yacuma and Santa Cruz. The programme of the mission is outlined in appendix 3.

During its stay in Bolivia, the NCEA worked closely together with an institutional counterpart team including professionals representing both Vice Ministries of Ministry for Environment and Water. This was done with the aim to agree on the scope, objectives and approach of this SEA. Their names are also listed in appendix 3.

The NCEA wants to emphasize that it has no opinion on the feasibility or acceptability of the Vivir con el Agua program. The NCEA only tries to guarantee that all essential environmental and socio-economic information has been provided for sound and well balanced planning and decision-making and through a transparent and inclusive process.

1.4 Approach taken by the NCEA

There is a draft SEA regulation (supreme decree) elaborated by the Ministry of Environment and Water, but this is not yet in force. To fill this current gap, the NCEA has developed tailor-made guidelines for this particular SEA in close collaboration with the Ministry (both VMRHR and VMMABCCDF). For this, the NCEA made use of its own practical SEA experience, SEA experience in Bolivia and international experience like the OECD/DAC SEA guidance[3].

The NCEA chose to structure this advisory report on the proposed SEA as follows:

- SEA preparatory (or screening) phase in Chapter 2, providing an analysis of the 'Vivir con el Agua' program, in order to define the role that SEA can play in the preparation, assessment and implementation of its components. This chapter essentially reflects the discussion within the NCEA working group needed to properly design the SEA;
- a scoping phase in Chapter 3, providing an overview of issues that need to be taken into account during the SEA. This Chapter builds on the outcomes of Chapter 2 and further details the scope and topics the SEA should address (contents);
- leading to Terms of Reference for the actual SEA in Chapter 4;
- Chapter 5 gives practical recommendations for implementation and management of the SEA process.

[3] OECD DAC Guidelines and Reference Series Strategic Environmental Assessment: Applications in Development Co-operation, www.seataskteam.net.

2. PREPARATORY PHASE

SEA practice has shown SEA to be most effective if it is informing a plan-making process in a pro-active manner, thus providing relevant information during plan formulation, before formal decision making takes place. To determine for which planning process and linked decision making the SEA has to be designed, a number of critical questions (see box below) was discussed during NCEA's visit. These questions help to properly design the SEA in relation to the Vivir con el Agua program. The results of the discussion that arose while finding answers to these questions are presented in paragraphs 2.1 to 2.6 below. To some questions, the discussion was not yet conclusive. In those cases, the specific paragraph contains a recommendation on what still needs to be done.

Critical questions for good SEA design

1) Which plan is going to be subject to SEA and what is the stage of planning?
2) What are the key issues that need to be addressed by the plan?
3) Who is/are the responsible agency(ies) ('the owner/developer of the planning process')?
4) What are the decisions to be taken in the planning process and when will these be made?
5) Spatial and time horizon; what is the geographical definition of the plan and which implementation period will it consider?
6) What is the budget and time-line of the plan process? And how much time and money is available for the SEA? Who will undertake the SEA and who will pay for it? This includes planning and budgeting for public participation.

2.1 Which plan is going to be subject to SEA, and what is the stage of planning?

The Vice Ministry has requested an SEA in relation to the 'Vivir con el Agua' program. The 'Vivir con el Agua' program is based on an elaborate participatory process in the region. This resulted in a commonly accepted, long term strategic vision for sustainable development in the Beni lowland region, within the boundaries set by the biophysical environment. This is the 'Living with Water' vision. The components defined by the program are presented as first, realistic steps in a long process of change that gradually replaces a present fatalistic attitude by a culture of pro-active adaptation and mitigation of water related problems. It is expected that this process of change will take several decades.

The decision to implement the 'Vivir con el Agua' program has been taken already. An SEA would thus not contribute to this specific decision. However, the program aims to initiate a variety of plan and project development processes, in which in due course some form of decision making will be needed at various levels of government. For these decisions the provi-

sion of information will be relevant and would consequently benefit from an SEA. At the moment there is no clear picture yet on what type of decisions would exactly imply, and in what time frame decision making will take place.

The SEA linked to the 'Vivir con el Agua' program therefore does not assess the consequences of the 'Vivir con el Agua' program itself. It moreover uses the program as a 'vehicle', so to speak, to develop an SEA process which pro-actively and interactively assists in the development of plans and projects under the 'Vivir con el Agua' program. In stead of reacting to an existing plan through an assessment, the SEA in this case contributes to the actual definition and further development of the plan, based on a vision of sustainable development in the region.

This approach is relatively new and differs significantly from a classical SEA in two ways:

- The SEA is pro-active. This implies that it starts simultaneously with and operates parallel to the 'Vivir con el Agua' program, feeding information during the elaboration of the various program components, evaluates the impact of measures and produces suggestions for mitigation and optimizing the programs components in an early stage when activities are not fully defined yet. The SEA process, in close collaboration with all relevant stake holders, thus actively contributes to the development of sustainable plans and/or projects.
- The SEA does not produce a single report, but continuously provides information and interacts at the appropriate moments.

Conclusion: The 'Vivir con el Agua' program provides an ideal opportunity to use SEA as a pro-active instrument in the further development of the program. Since the 'Vivir con el Agua' program intends to facilitate several plan and project implementation processes, it can act as a vehicle for an SEA process that supports these planning processes and informs related decision making processes. Vice versa, the SEA also helps to guide the further elaboration and implementation of the 'Vivir con el Agua' program.
This pro-active use of SEA is a rather new and a creative interpretation of the SEA instrument in the sense that it operates as a continuous process parallel to the 'Vivir con el Agua' program, and that it does not produce one assessment report, but multiple output during the implementation process. The added value of this SEA is that it assures that sustainable development functions as a continuous precondition for the development of the plan process and will thus assure a smoother implementation.

2.2 What are the key issues (problems and opportunities) for development that need to be addressed by the plan(s)?

The present situation

Water is a dominant factor in de Beni lowlands. Large parts of the area are flooded annually during 3-6 months, due to large quantities of river water coming form the Sierra and Cordillera regions of the country and intensive rainfall (averaging 1.800-2.000 mm/yr). During the El Niño years the flooded area extends to up to 120.000 km^2 (2007 and 2008 floods). The main river is the meandering Río Mamoré, originating from the Sierra region of Cochabamba and responsible for most of the flooding in the south-central part of the plains, including the area of Trinidad and Loreto. From the Chapare region in the southwest, several braided river systems are resulting in flash foods in the southern en central parts of the San Ignacio municipality. From Santa Cruz in the southeast, the Rio Grande discharges large amounts of water in the plains of the Marban province, part of it filling a large aquifer in that part of the plains. More to the North, flooding in the municipality of Santa Ana de Yacuma is particularly the result of flood waters originating in the plains fed by rainwater, together with the floodwaters from the Rio Mamoré.

The river systems do not only supply the Beni lowlands with large quantities of water but are loaded with fine sediments. Due to the long sedimentation process in the area of these fine sediments, the infiltration rate is extremely low. Other characteristics of the area are the relative flatness of Beni and the fact that all incoming water has to be discharged through one single outlet in the north of Beni. Due to these specific hydrological characteristics, the Beni lowlands can be qualified as an Inland Delta. This particular hydrological situation was already present in prehistoric era (1000 BC till 500 AD) when the former inhabitants (Moxos) adapted to the circumstances by building 'Lomas' (man-made hills) and 'Camellones' (small scale hydro-agricultural structures), where vegetables and fruits could be produced, probably in combination with fish farming throughout the year.

The problems

The periods of flooding and excess water are alternated by periods 3-4 months of meteorological drought and shortage of water in some areas. The influence of the 'El Niño' and the 'La Niña' effect in combination with the effects of climate change is gradually leading to more pronounced extremes in floods and drought. The inhabitants have largely adapted to this situation, but the occurrence of extreme events is a serious risk for economic development. The main economic activities in the area (cattle ranching and fisheries) are furthermore severely affected by the lack of proper and permanent communication and transport structures in the area. Due to the fact that during the wet periods most of the roads are flooded and out of use, water transport is the most common means of displacement. However, when in the event of an extreme flood large amounts of cattle have to be transported in a relatively short period of time, serious logistic problems occur, which results in the drowning of many heads of cattle.
Due to the large amounts of water, extreme floods over a vast area during long periods of time can hardly be prevented. This is why the measures of the 'Vivir con el Agua' program focus on adaptation and mitigating the effects of this particular situation.

Conclusion: Given the hydrological conditions of the Beni lowlands, the strategic vision of the 'Vivir con el Agua' program is focussed on a living with water approach, accepting the seasonal floods and droughts as an unavoidable fact of life in the Beni. The effects of increased extreme events can only be addressed through adaptation and mitigation measures. The NCEA agrees with this approach. Paragraph 3.1 will further elaborate on problems and opportunities for development when it comes to the scope for the SEA

Proposed means and planning processes to solve problems and enhance opportunities

The NCEA has made a rapid inventory of which means and planning processes are available to reduce the above observed constraints and to enhance opportunities.

- Elaboration of ***an early warning system for floods and droughts*** at national level. For the Río Mamoré a limited early warning system is in place and highly appreciated. Capacity for further elaboration of this system through river modelling is available at national level at SENAMHI. Communication and contingency planning components have to be implemented regionally. For the Beni department, the Departmental Operational Centre for Emergencies (COED) is in place for these tasks.

- ***Territorial (spatial) planning*** is existing but with limited practical use. The present plan has been elaborated from 1999-2004 and a new updated plan should be based on characteristics and risks of the area. This includes areas subjected to flooding, droughts and other vulnerabilities, and specific land use categories of particular value such as protected areas, aquatic ecosystem conservation areas, water storage basins and other areas of special value (e.g. Ramsar sites or similar). A combination with the early warning models can provide relevant information. For local ownership it is required to follow a participatory approach in such manner that people see their interests reflected in the plan. Detailed territorial planning can be provided at municipal level through a Municipal Territorial Plan (PMOT). This can feed into an updated Regional Territorial Plan (PDOT) process at departmental level.

- Municipalities are responsible for the development of ***local risk management plans, including the implementation of specific risk mitigation works***. Municipal risk management units are in charge. Coordination with early warning work, territorial planning work, and participation of directly involved stakeholders can lead to (cost-)effective measures.

- Biodiversity in large part of the area is in a virtually pristine condition and represents one of the most untouched large inland floodplain systems in the world. Also the flood regulation, water retention, groundwater provision, and fisheries (re)production services provided by these wetlands are relatively untouched. ***Opportunities for biodiversity conservation in combination with the maintenance of the area's productive resources*** are immense but so far underexploited. At departmental level serious attempts are being made to designate departmental parks, but so far predominantly in forested areas. Opportunities in wetland conservation in combination of wise use of wetlands should be elaborated.

- As repeatedly said, ***community action through participation*** in above planning exercises and an active role in the implementation of activities is an absolute necessity to move from plan to reality. In circumstances with limited government capacity, local ownership is the mechanism to get things going.

- ***Applied research and field trials*** related to the viability of pre-Colombian hydraulic cultures under different hydrological conditions is already implemented. Further activities at the level of directly interested communities can provide a means for dissemination of these techniques, adding to finding out whether these can be profitably implemented on a large scale.

- ***Institutional development*** at all levels. To make use of the available development opportunities, it is necessary that government departments at different levels, community organisations and local stakeholders develop the necessary skills to collaborate in an effective manner.

Conclusion: The observations during NCEA's visit confirmed that the 'Vivir con el Agua' program is based on a realistic appraisal of the available opportunities at various levels of government. All of the above described means and planning processes form an integral part of the program. The program also appears to be realistic with respect to the (sometimes limited) implementation capacities, and aims at capacity enhancement where needed.

With respect to decision making, for which the SEA may provide relevant information, the following elements are relevant:
- creation of new or updated departmental and municipal plans; plan formulation has yet to start.
- implementation of components such as the early warning system, or risk reduction measures may need additional decision making or legislative actions.
Paragraph 3.3 further elaborates on what is needed to identify planning processes and decision making steps which offer 'steering mechanisms' to solve problems and/or enhance opportunities.

2.3 Who is/are the responsible agency(ies)?

The Vice Ministry of Water Resources and Irrigation of the Ministry of Environment and Water is responsible for the coordination of the program 'Vivir con el Agua'. All components with a specific link to the Beni will be executed through regional and local government or organizations. The owner/developer of the planning process is also responsible for the SEA.

Conclusion: All stakeholders involved in the development of the 'Vivir con el Agua' program and its related plans, including the SEA, should clearly agree on tasks and responsibilities and who manages what.

The NCEA recommends to apply the *subsidiarity principle*, implying implementation of activities at the lowest possible organisational level, striving towards maximum (local) ownership. This principle intends to put responsibility and necessary means for activities at the lowest effective level, thus avoiding too much concentration of government power at high administrative levels far away from the location where action is needed. This leads to better local ownership and better adaptation of plans to local circumstances, while it reduces the administrative burden on higher levels of government. It relates to the law on decentralisation implemented in Bolivia.

2.4 What are the decisions to be taken and when will these be made?

The purpose of SEA is to help (improve) plan design and decision making. Therefore it is helpful to discuss in an early stage of planning what kind of decisions will be taken. Because of the characteristics of the 'Vivir con el Agua" program, itself not leading to formal decision making, but intended to initiate and support other planning processes, there is no clear view yet on the nature on contents of decisions to be taken.

Conclusion: Once the planning and decision making processes are more clearly identified, this issue will need further analysis. Paragraph 3.3 and 4.3 further elaborate on this.

2.5 Spatial and time horizon of the plans

There is a Regional Territorial Plan on a scale of 1: 1.000.000 (some parts 1:500.000) covering the entire Beni department (213.000 km^2). Its update (based on the reality of the area and a more suitable scale) requires many years of work and considerable investments.

Therefore, the 'Vivir con el Agua' program chose to concentrate on the development of Municipal Territorial Plans, and use these as an input for an update of the Regional Territorial Plan at departmental level. The Municipal Territorial Plans on a scale of 1:200.000 to 1:250.000 vary in area between 18.000 - 48.000 km^2 . Both the Regional and Municipal territorial plans have a time frame of 10 years (with an intermediate up-date after 5 years). There are 19 municipalities in Beni department, out of which 7 have a Municipal Territorial Plan. The 'Vivir con el Agua' program focuses on three municipalities, Santa Ana de Yacuma, San Ignacio de Moxos and Loreto, which currently do not yet have a Municipal Territorial Plan.

It will take some time for the Municipal Territorial plans to be finalized and their scale will not be sufficiently detailed to generate information for work at local level. Therefore the 'Vivir con el Agua' program includes a component to elaborate risk management plans at local level and measures to reduce and mitigate the negative impact of flooding and droughts. Based on existing knowledge, each of the 3 municipalities will select a number of villages or communities that are most vulnerable and are representative in terms of inhabitants, hydrological conditions and economic activity. For these villages, plans will be made and implemented of small-scale works and measures to reduce water related risk and damage making use of local knowledge. The measures will be implemented by the municipalities together with affected villagers/stakeholders. These local plans (Planes Locales y Prediales de Ordenamiento Territorial) are pilots and serve as an example for the wider region. Their scale varies from 1:25.000 - 1:50.000 and cover an area of 2- 10.000 ha for individual farms or communities/villages and 40-50.000 ha for clusters of farms and/or communities/villages.

Conclusion: The 'Vivir con el Agua' program includes a component of Municipal Territorial Planning. At local level, risk and spatial planning is part of the Local Risk Management Planning component of the programme. These plans will feed into the updating process of the Regional Territorial Plan for Beni.

2.6 Budget and time-line of the plan process and the SEA

A start of the implementation of the 'Vivir con el Agua' program and related plans will take place the next two years (2012-2013). Therefore, as the SEA will have to be developed in parallel with the 'Vivir con el Agua' program, preferably also the SEA will take about two years. The NCEA was informed that the budget allocation for the SEA is 100.000 euro.

Conclusion: Due to the fact that several components of the 'Vivir con el Agua' program still have to be outlined and developed, the NCEA recommends a more pro-active and interactive and process oriented SEA, that runs parallel to the implementation of the different measures and components of the 'Vivir con el Agua' program. As stated already in 2.3, it is of the utmost importance that at this stage agreement is reached on who is responsible for what. Knowing the budget and timeline of the SEA, the NCEA has taken these as benchmarks for the advisory Terms of Reference in Chapter 4. It is expected however, that the planning processes that will be initiated by the 'Vivir con el Agua' program will take a much longer implementation period. Therefore Chapter 4 also addresses a mechanism for SEA follow-up.

3. Scoping

The purpose of scoping is to come to the specification of the process and content of the SEA and the scope and topics to be investigated (Chapter 4). The NCEA has done this through a three step approach:

- Understanding/analyzing the current and future situation, which will show the problems and opportunities that the specific plan(s) have to deal with (3.1)
- Definition of guiding principles for a long term sustainable 'Vivir con el Agua' strategy (3.2)
- Further analysis of planning processes which offer implementation mechanisms and what kind of decisions are required (3.3)

These steps are further detailed below.

3.1 Analysis of water related development constraints and opportunities in the Beni lowlands

Important functions of the Beni lowlands can be summarized as:

- *Water storage and release*

Multiple rivers flow from southwest and southeast into the Beni wetlands. The combination with significant seasonal rainfall leads to a wetland system characterized by seasonal floods. It takes several months before these floods recede, caused by extreme flatness of the area, limited infiltration and the presence of only one, limited outlet to the North. In this respect the wetlands create a formidable flood retention reservoir for the lower Madera river, providing a flood control function during the rainy season, and water provision in the dry season.

- *Biodiversity conservation*

The Beni lowlands are very scarcely populated and used in an extensive manner, predominantly for cattle ranching. As a result, biodiversity is in many areas in a relatively pristine condition. This observation is supported by a GLOBIO biodiversity modeling exercise by Fundación Amigos de la Naturaleza (FAN) in Santa Cruz. Because of the productive nature of flooded wetlands, yearly maintained by nutritional sediments, richness in species and numbers of individuals per species is impressive.

- *Human settlements and basic services*

People have different strategies to deal with yearly floods. Throughout history people have used elevations, natural as well as man-made, to settle. Others built houses on poles or on river banks, moving with the river when these divert their course. Emergency relief efforts have created a certain dependency on emergency aid, leading to neglect of former flood resilient constructions. Urban development in some settlements has led to increased inundation risk (such as Trinidad and Santa Ana de Yacuma).

- *Transport systems: roads, waterways, airstrips.*

Transport of goods is traditionally done via waterways. Villages and cattle ranches have air-strips. During the dry season a limited number of unpaved trunk roads and inter-municipal roads is available. Most of these are impracticable or even closed for periods from 3-6 months.

- *Soil productivity, basis for cattle ranching and agriculture*

Extensive cattle ranching is the most wide-spread economic activity, practiced in the area for centuries. Cattle densities range from one head per 6/8 ha to much less. During flood season cattle is collected on higher mounds, or transported to Santa Cruz for fattening and sale. Agricultural activities are limited to local villages/communities. Historical evidence suggests that agriculture has been much more important in pre-Colombian times through the use of so-called 'Camellones'. Experiments to reintroduce and modernize these techniques show promising results.

- *Fish production*

The complex river system is rich in fish resources and provides livelihood to many fishermen and -women. Furthermore, fish-culture is practiced in some areas.

- *Other environmental functions*

Public water supply is reported to be a problem in some areas due to pollution of surface waters, and limited recharge capacity of groundwater aquifers.
The area's landscape features make it an interesting tourism destination. So far the area has very limited accommodation capacity, predominantly around Rurrenabaque.
Forestry/agro-forestry: extensive gallery forests along the rivers provide a source of wood and non-timber forest products. The NCEA has not looked into this during its visit.

Autonomous development: constraints in development when nothing happens

Climate change is expected to lead to more frequent and more extreme floods, periods of more extreme droughts, and consequently more fires. Projecting this trend over existing constraints provides a problematic development potential for the region, affecting cattle ranching, fishery activities and available drinking water reserves. During dry periods, excessive burning of grass land occurs, which is reported to have a negative influence on water quality.

Human settlements are confronted with more extreme floods and longer drought periods, lack of all-weather access and closure of roads and other transport facilities during long periods; high costs of energy (electricity and gas); insufficient and low quality of public services (health and education). Health issues such as the occurrence of malaria and dengue fever is repeatedly stated as an increasing problem.

Extensive *cattle ranching* is the most important productive activity of the Beni plains. Recent genetic innovations in cattle have resulted in increased productivity, making the low nutritional value and limited productivity of the pastures more visible (low P-levels in particular); floods and droughts, endemic foot-and-mouth and other animal diseases, lack of transport (to avoid floods) and lack of processing facilities (slaughter houses, cold-stores) limit further development opportunities.

Agricultural production is mostly self-sufficient and traditional. An exception is the mechanized wetland rice production in the Marban province producing rice for the Santa Cruz markets.

Even though *fishermen* appear to be well organized, their basic knowledge on the role of wetlands in fish productivity is limited, suggesting there is room for enhancement in fisheries productivity. Regulations appear to be lacking.

The *tourism sector* is generating little added value. Further development is limited by difficult access, and the lack and low quality of infrastructure and services.

According to local indigenous people the *forestry* sector is characterized by mostly illegal activities (logging and hunting) and a lack of a proper plan with an effective control system (CITES species) and a legal framework.

Institutions have limited capacities; in some remote areas the government is almost absent.

The *legal framework* in relation to land and other natural resources in the region is not adapted to the specific conditions of the region necessary for sustainable development. The legal framework for the conservation of the biodiversity through national parks, is well advanced, but has its main focus on forested areas.

Development opportunities: chances for a 'Vivir con el Agua' approach

- Lower located and semi-permanently inundated areas could receive formal recognition as areas with important hydrological functions, combined with important biodiversity values and potential (and maybe reproductive zones for fish). Thus functions can mutually reinforce each other. Research carried out by FAN shows that on a regional level, deeply flooded areas represent some of the most pristine and important biodiversity areas. Further detailed analysis is needed. The Bolivian law on protected areas allows for other non-biodiversity related criteria for Protected Area recognition. Similarly, the RAMSAR wetland convention has a hydrological criterion[4] for the recognition of wetlands of international importance.

- Combinations of effective early warning and local prevention practices (for example through cattle refuge platforms and mounds, river transport facilities, emergency animal feed and fodder storage structures), provide effective "living with floods" options at local and community level. The present early warning system could be further optimized and effectively connected to the existing emergency plans and sets of tailor-made emergency

[4] Ramsar convention. Criterion 1d) **Hydrological importance**. As indicated by Article 2 of the Convention, wetlands can be selected for their hydrological importance which, inter alia, may include the following attributes. They may:

i) play a major role in the natural control, amelioration or prevention of flooding;
ii) be important for seasonal water retention for wetlands or other areas of conservation importance downstream;
iii) be important for the recharge of aquifers;
iv) form part of karst or underground hydrological or spring systems that supply major surface wetlands;
v) be major natural floodplain systems;
vi) have a major hydrological influence in the context of at least regional climate regulation or stability (e.g., certain areas of cloud forest or rainforest, wetlands or wetland complexes in semi-arid, arid or desert areas, tundra or peat land systems acting as sinks for carbon, etc.);
vii) have a major role in maintaining high water quality standards.

measures so that a mutual reinforcement of both can be achieved. Addressing clear responsibilities in the execution of emergency measures is part of this.

- Reactivation, modernization and up-scaling of pre-Colombian hydraulic culture practices ('Lomas' and 'Camellones' that are now in an experimental stage, Loma Suarez) as the basis of sustainable, low risk, agricultural, horticultural and hydro-agricultural production systems, producing food and fish for local markets and potentially also fodder to be stocked during floods and other emergencies.

- River transport as a low-cost and environmentally friendly way of transport of goods (bulk goods in particular) is an important and underused opportunity.

- Effective early warning systems as tools in the management and maintenance of transport facilities (roads in particular).This helps to determine where improvement of the local transport infrastructure is most needed so that evacuation of live stock and inhabitants can be safely done in a short period of time.

- Abundant wildlife in the plains offers opportunities for tourism development, ecotourism in particular.

3.2 Basic principles for a long term sustainable 'Vivir con el Agua' strategy

The 'Vivir con el Agua' program consists of a number of sub-programs that need to be developed into concrete plans during the course of implementation. Consequently, there is no concretely defined plan yet which can be subjected to an SEA.

This provides ample opportunity for a more pro-active SEA which does not assess the consequences of a proposed plan, but moreover helps in the definition of plans in a pro-active manner.

Contrarily, the SEA can be designed as an instrument to guide the planning process(es) by means of a number of planning principles, aimed at the long-term sustainability of regional development activities. These principles in itself can eventually be transformed into a long-term sustainable development vision for the region. The principles are outlined below (and are not exhaustive):

Sustainable development

- Regional development is based on inventory of regional ecosystem functions[5] , their stakeholders, and the optimization of their use in a participatory manner.
- History of human occupation and exploitation of the area provides important background information on, for example, (traditional) rights of different groups.
- Areas can be multi-functional: where maximization of one function goes at the cost of other functions, this should be avoided in the case that maximization of the combined

[5] The term "ecosystem services" is in Bolivia associated with monetisation of ecosystems through, for example, payments for ecosystem services, something which is fiercely rejected. To avoid any misunderstanding NCEA therefore avoids the use of the term ecosystem services and refers to ecosystem functions.

delivery of functions provides more societal benefits than maximization of one function only.
- Creation of maximal added value to locally produced commodities through effective market chains.
- No activities with long-term detrimental effects on the resources of the area.
- No activities which may affect the livelihoods of local communities in a negative manner.

Water and natural disaster risks as leading planning principles

Water (and related flood, drought and fire risks) are the leading elements in all territorial planning and municipal risk management plans; this implies:

- Based on the hydraulic model study, inundation maps and simulations should be made that indicate the maximum inundation levels within the area.
- Based on these inundation maps conclusions can be drawn for minimum requirements on the levels and strength of planned constructions and facilities.
- Stimulating the use of flood-resilient structures in the yearly flooded areas.
- Concentrate human habitation and basic social services in safe areas.
- Locate road and transport corridors in low-flow areas and make them resistant and reliable during floods.
- Apply measures to *minimize flood impacts* such as:
    - Creation of high lying living areas (if possible making use of the many existing 'Lomas' that exist within the area)
    - Protection of areas with relative high population densities with dikes/bunds
    - Creation of safe (refugee) areas for cattle, where they can be supplied of sufficient food during several months
    - Removal of obstacles (like fences) which causes problems for cattle in case of flooding, and other ways of marking of boundaries of private land
    - Reduction of obstacles in the river catchment area which may stagnate water discharge
    - Construction of flood channels, ditches or gullies e.g. around populated areas.
- Apply measures to *minimize drought impacts* such as:
    - The implementation of systems for the collection of rainfall water (for the purpose of storage of drinking water);
    - Retention of surface water on strategic locations within the area (preferably contributing to strengthening of biodiversity)
- Apply measures to *minimize impacts from burning* enhancing fertilization and enrichment of the relatively poor grasslands in an effective way on the one hand and preventing negative impact on water quality and fishery activities on the other hand.

Lowest level of effective implementation (subsidiarity).

- Implementation of activities at the lowest possible organizational level, striving towards maximum (local) ownership (subsidiarity principle, see also 2.3).
- Directly linked to this is the principle of participation of direct stakeholders in all stages of program implementation. For each activity stakeholders may be different, ranging from national, departmental and municipal authorities to cattle ranchers, fishermen associations, farmers organizations, village organizations, or local commerce and industry.

Use of local and archaeological knowledge

- Local knowledge can help to better understand how the hydrological system works, and reacts. What sources contribute at what time to the inundations (rainfall, river systems from other neighboring areas (Cochabamba and Santa Cruz), duration, discharge and travel time of the water flows, etc. Especially the cattle ranchers ('ganaderos') seem to have good ideas/solutions which may contribute to the 'Vivir con el Agua' approach.
- The revitalization and modernization of ancient hydraulic agriculture (Moxos) appears to provide a so far unknown development potential for the specific circumstances in the Beni lowlands.

3.3 Planning processes and decisions

The above identified planning principles can be used to guide the plans outlined below, that probably will get started during or as part of the 'Vivir con el Agua' program. During and after the implementation of the 'Vivir con el Agua' program, more moments of formal decision making can be expected. Measures in relation to the early warning system, emergency measures and plans, local implementation of project components, or designation of, and construction in areas with some form of protection may all need some form of local, regional or national decision making. By designing the SEA as a parallel continuous process, the activities leading to formal decision making can be identified in an early stage, and information can be geared towards informed decision making, as and when required.

Regional Territorial Planning on departmental scale (PDOT)

Through the PDOT, the following decisions can be taken on a broad scale:

- identification of priority areas for different hydrological functions and biodiversity conservation
- preparation of risk management plans of large areas suffering most from flooding, inundation, stagnant water and drought stress
- identification of areas which are suitable for specific wetland land use forms.

For all other applications related to spatial planning, the information is insufficient and/or not detailed enough. During its visit, NCEA was informed by FAN that they already developed a strategy for the conservation of the Beni wetland ecosystems. In addition, the elaboration of flood risk maps is part of the 'Vivir con el Agua' program. These flood risk maps together with the information and strategy of FAN can be used as a sound basis for updating of the present PDOT.

Municipal Territorial Planning (PMOT)

A PMOT allows sub-regional and municipal planning and decision making on:

- both the urban centers and the rural areas, identifying which areas are suitable for agriculture, cattle ranching, fisheries and other forms of land- and water use
- (sub)watershed management planning
- where risk areas are situated and what can be done to reduce impacts and risks
- planning of transport and other economic infrastructures, like the best location for roads, waterways, air connections and energy networks
- identification and development of regional transport corridors and development of economic development areas ('polos de desarrollo')

- public services, including education, public health, market facilities, local industry etc., including how, to what extent and with which priority these services need to be improved
- environmental planning and management, identifying which areas can be earmarked as nature areas, buffer-zones etc.

The data bases to be prepared as part of the PMOT are important tools for general (sustainable) development planning.

Planes Locales y Prediales de Ordenamiento Territorial

These plans may be used in spatial and multi-risk management at local level, including:

- the elaboration of local risk management plans and risk reducing investment plans
- vulnerability evaluations at local and community/village levels, including environmental management planning
- the deforestation and hydraulic structures authorization certificates, required by law
- (sub)watershed management.
- farm management planning

4. Terms of Reference for the SEA to be carried out

By following the 'Vivir con el Agua' program, the SEA gets a, so to speak, 'flying start', making use of the available program activities, but having an impact well beyond the time horizon of the program, as it may effectively influence the departmental and municipal planning processes. These plans have a much longer time horizon.

The following activities (4.1 to 4.7) are defined as minimally necessary to make the SEA effective in providing pro-active guidance to the implementation of elements of the 'Vivir con el Agua' program. The order of the activities does not implicate a logical sequence of activities. In practice these activities will probably be organized in a parallel manner, depending on the order of implementation of the 'Vivir con el Agua' program.

4.1 Elaborate strategic sustainability principles into a long term vision for the region based on realities

The SEA should elaborate the principles mentioned in Paragraph 3.2 in a long-term vision on sustainable development, based on experiences obtained during the implementation of the 'Vivir con el Agua' program. The program and related SEA can thus serve as the start of a larger and longer lasting sustainable development plan for the Beni department.

The SEA should use these strategic sustainability principles as a yard stick for the development of activities in the 'Vivir con el Agua' planning process, in a pro-active manner and re-active manner. The principles are an input in the 'Vivir con el Agua' program development process. Draft plans (or even ideas for plans) coming out of the 'Vivir con el Agua' program can be assessed, using the principles as assessment criteria. Probably, the principles have to be elaborated in more detail for each assessment, thus contributing to a more detailed sustainable development vision for the region. An example is given in the box below:

Water and natural disaster risks as leading planning principles

- Apply measures to *minimize flood impacts* such as:
    - Protection of areas with relative high population densities with dikes/bunds
        - Apply lessons learnt from countries with similar periodic flooding such as Bangladesh, the Mekong delta in Vietnam and the main Deltas in China.
        - Pay attention to monitoring and maintenance in designing the protective structures.
        - Use local available means in strengthening the dike/bund slope constructions and cover slopes with a thick grass layer (green dikes).
        - Avoid planting and growing of trees on or along the dike constructions, because they may weaken the constructions in the long run.
        - Make construction expandable. Flood levels may rise in the near future so make reservations for future expansions of these constructions

4.2 Baseline

To be able to assess the consequences of certain measures, to make a clear distinction between impacts of the program and consequences of autonomous development processes, and to monitor progress of implementation, it is essential to have a baseline description of the region at the onset of the program. A baseline description provides, preferably, quantified information on the situation at a given moment in relation to the issues addressed by the program, and describes expected trends in these, as far as knowledge goes.

It is expected that the SEA does not need to carry out all studies, but moreover, has to guide the activities in the 'Vivir con el Agua' program in such a manner that relevant baseline information becomes readily available. Where information is obviously lacking and not to be expected from one of the components, the SEA should make an effort to collect the information.

Elements that need to be available in a baseline include:

Hydrological baseline: Consisting of the hydrological characteristics and mapping of the surface and ground water systems, within and flowing towards the Beni lowlands, the main watersheds; fluvial processes and discharge, type of rivers (meandering en braided systems), including channel shifting characteristics; morphological and sedimentological characteristics of the main rivers; soil infiltration data. Based on these data, flood and drought risk maps should be prepared. This information should preferably be made available in an early stage of the SEA process and should be an integral part of the hydrological modeling study.

Meteorological characteristics: analysis of rainfall (including El Niño and La Niña characteristics); and evapo-transpiration characteristics, differentiations and trends in the region: total amounts, peak intensities and spreading over the year.

Population baseline: part of the municipal risk planning component. Preferably includes indicators on social development and well-being (level of education, health situation, provision of water, sanitation and health care, household income).

Land use, land suitability and land occupation map: to be included in the territorial planning component. Additional information on productivity/importance of main economic sectors depending on the environment (e.g. cattle breeding, fisheries, forestry, agriculture).

Biodiversity baseline. At least a map of main ecosystems, potentially combined with the land use map. Characterization of these ecosystems, indicating the (potential) occurrence of species for which Bolivia has an international responsibility or species which are nationally recognized as being threatened. Also indicating areas with important ecosystem services for local population (e.g. forestry, fisheries, (ground)water supply, water transport). To be elaborated under the ecosystem management and conservation component. An assessment of the status of FAN's biodiversity strategy for the Beni wetlands and its underlying information basis in relation to 'Vivir con el Agua' is needed.

Institutional baseline. Normally, the capacity of the competent government institutions to monitor and enforce compliance with laws, regulations, and/or standards is part of a baseline. In this particular SEA it will be focusing on a more in-depth SWOT analysis (see section 4.5).

The baseline serves three purposes:

- To evaluate and monitor if the program is performing as intended. Program objectives of 'Vivir con el Agua' thus need to be translated into measurable indicators of achievement.
- To monitor the sustainability of the program. Indicators need to be derived from the long term vision on sustainable development (see sections 3.2 and 4.1).
- To monitor external developments that are beyond the control of the program but are expected to have a significant influence on the program (i.e. climate change related changes in meteorology and hydrology; up- or downstream interventions; population growth and land use);

A set of baseline indicators needs to be defined in a collaborative effort between the 'Vivir con el Agua' team and the SEA expert(s), preferably at the inception stage of the program.

4.3 Overview of existing legislation and plans with relations to the 'Vivir con el Agua' program and approach (consistency analysis)

The 'Vivir con el Agua' program and related plans may be influenced in various ways by other plans or programs, or by environmental protection objectives such as those laid down in policies or legislation. Knowing these relationships makes it possible to take advantage of potential synergies and to deal with any inconsistencies and constraints. Consistency of government policies avoids future implementation problems. This requires an inventory (both public and private) at (inter)national, regional and local level.

At the international level, this implies for example the Convention on Biodiversity. At the national level, this implies taking into account the explicit and implicit social, economic and ecological criteria formulated in the National Development Plan, which are based on the concept of 'Vivir Bien'. Other relevant plans are the Bolivian Poverty Reduction Strategy (EBRP) and the National Agricultural and Rural Development Strategy (ENDAR), etc. Examples for the environmental sector are the Strategic Plan on Forests, the National Water-shed Program, the Plan for Protected Areas, the National Wildlife Program etc. Specifically for the Beni, the Departmental Socio-Economic Development Plans may be relevant.

The SEA should make an inventory and analysis of which policies/plans or programs:

- generate opportunities when formulating new plans
- set environmental and socio-economic conditions (criteria) for the new plans
- have the potential to conflict with the new plans and how can these conflicts be solved.

4.4 Inventory of necessary steps in decision making to implement components of the 'Vivir con el Agua' program and beyond

SEA is intended to inform decision making. Formal decision making is needed to create recognized plans with formal (legal) status. The program proposes to create new or updated departmental and municipal (and local) plans, but the process of plan formulation has yet to start. Furthermore, the implementation of concrete components such as the early warning system, or risk reduction measures may need additional decision making or even legislative actions. Paragraph 3.3. already gives an initial overview of formal plans and options for decision making. The SEA should further elaborate on this and can thus help to make the right choices, that is deciding on the 'best strategies and measures' according to predefined basic principles in 4.1. (using these as a yardstick or review framework).

These strategies and measures can be of different nature such as technical, institutional, legal, change of behavior/tradition and when having a spatial component, become part of territorial planning.

At pre-defined moments during the process formal decisions have to betaken. It is the role of the SEA to make sure that at the appropriate moments in time, information becomes available for decision makers, provided in the right language and format for decision makers to take an informed decision and for stakeholders to recognize their interests.

Taking into account the basic principles identified in 4.1., the SEA thus helps to 'steer' the 'Vivir con el Agua' program in terms of:

- deciding which measures can or will have to be taken anyway ('quick wins', 'no regret' options or measures that are absolutely necessary)
- providing alternative options for some measures or program components in terms of (i) yes/no implementation, (ii) different locations, (iii) difference scales or sizes (iv) difference in ambitions or phasing or (v) difference in focus (technical measures versus institutional measures)

4.5 Institutional strengths and weaknesses, including assessment of capacity of participating agencies

The capacity of governmental and community institutions is said to be weak. A detailed (SWOT) analysis of institutional strengths and weaknesses is needed, based on roles and responsibilities of each of the participating actors. What is the capacity of the competent government institutions to monitor and enforce compliance with laws, regulations, standards and/or conditions that are necessary for achieving the objectives that the 'Vivir con el Agua' program and related SEA is addressing? What is the adequacy of existing planning instruments? Additional capacity development actions in terms of knowledge, ambition and implementation capacity should be formulated for each actor having a role in the program.

4.6 Stakeholder involvement

The formulation phase of the 'Vivir con el Agua' program was characterized by an elaborate participatory process to include views and opinions of directly affected stakeholders. This was considered an absolute necessity to create enthusiasm and ownership of the program, in order to make the much needed change from rather fatalistic attitude to an adaptive management and active preparedness. In this advisory Terms of Reference for the SEA, the NCEA has repeatedly stated the importance of a participatory approach, to maintain this popular enthusiasm in the further elaboration and implementation process of the program.

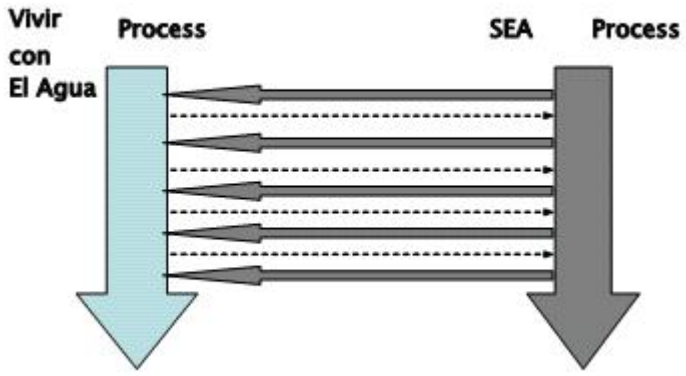
Of course this also applies to the SEA process. Where necessary , the SEA should describe how relevant stakeholders can effectively be involved in the process (original inhabitants, agricultural representatives, NGO's and relevant administrative representatives, etc), in order to create enthusiasm and ownership for the program's measures. It is recommended to build further on the network created during the formulation phase of 'Vivir con el Agua'. Appendix 5 provides example guidelines based on experience on how this participative process has been applied and executed in other SEAs.

4.7 Monitoring and follow up

To assure adequate implementation of the 'Vivir con el Agua' program and related plans, the SEA should propose mechanisms (e.g. who would be responsible, required resources, supportive or remedial action when needed) to check whether the program is implemented according to decisions taken. At the end of the two year implementation period of 'Vivir con el Agua', the SEA should also suggest means to guide and monitor continuation and follow-up of the 'Vivir con el Agua' program.

5. Implementation and management of the SEA process

The SEA process is a continuous process (see below), which is pro-active, transparent and independent. It is therefore not primarily aimed at providing an SEA report, but moreover aimed at pro-active involvement in the implementation of the 'Vivir con el Agua' program, in provision of information for decision making, and aiming to have an influence beyond the time horizon of the 'Vivir con el Agua' program.



The SEA process operates in close collaboration with, but independent of the 'Vivir con el Agua' programme, both under responsibility of the Vice-Ministry of Water Resources and Irrigation. However, the Beni government and Vice Ministry of Environment should be included in all in both processes as well. Therefore the NCEA recommends to form a Steering Group for this SEA, in which representatives of the most important governmental stakeholders have a seat (eg. at general directors level from both Vice Ministries and Beni government). This steering group meets regularly to guide the SEA process and review progress. This steering group is especially meant to guarantee the political back-up and support for undertaking this SEA.

The SEA itself does not need to generate much information as this will be done by the 'Vivir con el Agua' program already to a great extent. By working pro-actively it can guide the 'Vivir con el Agua' team in defining the information requirements for effective plan formulation and implementation. The NCEA has noted that information is available also outside the 'Vivir con el Agua' program. NGOs such as FAN and the Instituto de Ecología (linked to the University of San Andrés in La Paz) have a wealth of information which can be used for the SEA.

The SEA provides guiding principles and assesses draft plans coming out of the 'Vivir con el Agua' process against these principles. The NCEA thus recommends to appoint an SEA expert for at least the entire the duration of the 'Vivir con el Agua' program, who is suggested to work in close collaboration with the 'Vivir con el Agua' team at all levels of government. Apart from salary, travel and lodging will be the largest budget item for the SEA.

The SEA expert is expected to be well informed on Bolivian planning and legislation procedures, preferably in relation to environment, territorial planning and/or water management. The SEA expert will also be responsible for involvement of all relevant actors and stakeholders and building up mutual understanding and ownership of the results. This person therefore should not only have (environmental) knowledge, but also communication and dialogue abilities to coordinate with planners/decision makers. This is important because knowledge generates information for dialogue with stakeholders and decision makers, but from dialogue also knowledge questions arise. Networking with planners is essential to find out what their information needs are and when they need it. In order to enhance transparency, it is essential that the results of these three processes (information generation, dialogue and influence in planning and decision making), are documented and published.

Within the available budget and time-line for the SEA, decisions have to be taken on the SEA expert, including whether this will be one person and whether budget should be set aside for limited involvement of other supporting experts. Other issues are:

- whether and when to insert review moments for quality assurance of both SEA contents and process
- planning AND budgeting for stakeholder participation
- costs for reporting (e.g. SEA inputs for decision making as and when required, workshop reports, public consultation documented, copies to be deposited for public access)

APPENDICES

With the Advice on Terms of Reference SEA
Vivir con el Agua – Bolivia

(appendices 1 to 5)

APPENDIX 1

Letter of MMAyA of 29 June 2011.

Estado Plurinacional de Bolivia

MMAyA
Ministerio de Medio Ambiente y Agua

La Paz, Junio 29 de 2011
MMAyA/VRHR Nº 1239/2011

Señor a
Ing. Ineke Steinhauer,
Techn. Secr. Int. Cooperation
Commissie MER
P.O.Box 2345, 3500 GH Utrecht
Holanda

Ref.: ***Solicitud de apoyo mediante Consultoría de Asistencia Técnica para el Programa "Prevención y Gestión de Riesgos de Inundaciones en el Beni - Vivir con el Agua" – Bolivia***

De mi mayor consideración:

El Viceministerio de Recursos Hídricos y Riego dependiente del Ministerio de Medio Ambiente y Agua, se encuentra en el proceso de arranque del programa "Vivir con el agua", el mismo que consta de 6 componentes, entre los cuales se encuentran:

1) *Implementación de un sistema de alerta hidrológica con tecnología hidro-informática, para la cuenca media del Rio Mamoré*
2) *Complementación y actualización del Plan de Ordenamiento Territorial en base a las condiciones hidrológicas y los riesgos de inundaciones en la cuenca media del Rio Mamoré.*
3) *Preparación de Planes Municipales de reducción de riesgos de inundaciones en los municipios de Santa Ana de Yacuma, San Ignacio de Moxos y Loreto*
4) *Implementación de infraestructura habitacional y productiva con técnicas basadas en las culturas ancestrales del pueblo de Moxos, en las comunidades más vulnerables*
5) *Inventario y estudio de los ecosistemas acuáticos funcionales e identificación de zonas aptas para humedales.*
6) *Componente de Coordinación Monitoreo y Seguimiento al Programa*

En este sentido, me permito solicitar el apoyo de una misión de alto nivel técnico de su prestigiosa institución con la finalidad de contar con asesoramiento respecto a: i) aspectos ambientales estratégicos para la elaboración de planes municipales de gestión de riesgos e inundación; ii) estudios de ecosistemas acuáticos, con miras a la designación de humedales y sitios RAMSAR; y iii) aspectos metodológicos de análisis de impacto ambiental y medidas de mitigación a incorporar en los procesos de ordenamiento territorial regional y municipal en las llanuras inundables del Beni.

Agradeciendo de antemano su colaboración y atención a esta solicitud, saludo a usted muy atentamente,

n. Carlos René Orsuño Yáñez
...ISTRO DE RECURSOS HIDRICOS Y RIEGO
...ISTERIO DE MEDIO AMBIENTE Y AGUA

MINISTERIO DE MEDIO AMBIENTE Y AGUA
V°B°
V.R.H.R.

c.c.: Arch. Corr.
COYGAV/mim

Netherlands Commission for
Environmental Assessment

Sr. Ortuno
Viceministro de Recursos Hídricos y Riego
Ministerio de medio Ambiente y Agua
Calle Capitan Castrillo No 402, Esq. de 20 Octubre
Edif. Nazareth
La Paz
BOLIVIA

your reference
MMAyA/VHRH No 1239/2011
your letter
Junio 29 de 2011
our reference
OS23 -L10/IS/jz
enquiries to
Sra. I.A. Steinhauer
direct phone number
+31 (030) 234 76 54

Fecha : *24 de Agosto 2011*
Asunto: *Solicitud de apoyo por la Comisión holandesa de Evaluación ambiental programa Vivir con el Agua.*

Distinguido Sr. Viceministro Ortuño,

Recibimos su carta de Junio 29, solicitando asistencia técnica para el Programa 'Vivir con el Agua' en el Beni, y le agradecemos por la confianza expresada en nuestra institución.

Dentro del equipo internacional de la Comisión holandesa para la Evaluación Ambiental discutimos su solicitud, tomando en cuenta alguna información de fondo que nos proporcionó el Sr. Van Barneveld mediante el documento 'Vivir con el Agua' (de Marzo 2009). Esta discusión interna resultó en un par de aclaraciones y una propuesta resumiendo cómo nuestra asistencia técnica puede contribuir a este Programa tan relevante.

Algunas aclaraciones:

i) La Comisión holandesa para la Evaluación Ambiental asesora sobre la aplicación del instrumento 'Evaluación Ambiental Estratégica (EAE) y no sobre 'aspectos ambientales estratégicos' o 'planificación estratégica' en si. Por tal razón, destacamos que nuestro apoyo será vinculado con EAE, asesorando sobre los Términos de Referencia (TdR) de la EAE con el fin de mejorar la EAE y la planificación estratégica. En este asesoramiento, integraremos las experiencias en EAEs en Bolivia, pero también EAEs comparables en otros países, de esta manera aprovechando del estado de conocimiento al nivel global.

ii) Como la legislación ambiental Boliviana exige una EAE por programas y planes, tales como 'Vivir con el Agua', nos parece importante coordinar y trabajar conjuntamente con el equipo EIA/EAE del Viceministerio de Medio Ambiente, Biodiversidad, Cambio Climático y Gestión de Desarrollo Forestal y su nivel directivo, visto que es la Autoridad Ambiental Competente Nacional también respecto RAMSAR.

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iii) La Comisión no ejecuta inventarios o estudios (como los de los ecosistemas acuáticos), pero si puede asesorar sobre tales estudios como parte de los TdR para una EAE, detallando qué tipo de información la EAE misma debe compilar sobre el tema.

iv) El involucramiento de la Comisión (una visita a Bolivia con un grupo de expertos) podría ser organizada probablemente en octubre, y sería muy útil contar con un equipo contraparte de su Vice Ministerio, teniendo así una garantía en términos de compromiso y pericia disponible para la ejecución misma del estudio EAE.

Propuesta para el asesoramiento por la Comisión:

La Comisión define a la EAE como un instrumento que ayuda en la toma de decisiones y que complementa a la planificación, estableciendo planes y programas. En base de una lectura de su carta, y esperando que lo interpretemos correctamente, la Comisión propone que asesore sobre dos tipos de planes, siendo componente 2) en 3) del Programa 'Vivir con el Agua'.

2) 'Complementación y actualización del **Programa de Ordenamiento Territorial** en base a las condiciones hidrológicas y los riesgos de inundaciones en la cuenca media del Río Mamoré'.

3) 'Preparación de **Planes Municipales de reducción de riesgos de inundaciones** en los municipios de Santa Ana de Yacuma, San Ignacio de Moxos y Loreto'.

Ad 2) Existe un Plan de Ordenamiento Territorial a nivel regional para partes del Beni (de 1990), pero este Plan apenas da atención a las condiciones hidrológicas específicas de la zona. Hay necesidad de establecer un nuevo Plan, en lo cual la hidrología y los riesgos y amenazas de inundaciones y sequías son principios rectores. En esto, cambio climático se considera como un tema transversal.

El componente 5) 'Inventario y estudio de los ecosistemas acuáticos funcionales... ' puede ser integrado de la siguiente manera: En el estudio EAE se debe hacer un inventario describiendo dónde se encuentran estas áreas, qué áreas son amenazadas y qué se debe hacer para protegerlas? El concepto 'servicios de ecosistemas' puede ser aplicado en el estudio EAE para generar recomendaciones para el uso y la protección de estos áreas. Sus implicancias pueden ser fijados en el Plan de Ordenamiento Territorial.

Ad 3) Planes Municipales de reducción de riesgos de inundaciones en 3 municipios.

El componente 4) 'Implementación de infraestructura habitacional y productiva con técnicas basadas en las culturas de Moxos...' puede ser tomado en cuenta de la siguiente manera: En el estudio EAE se puede evaluar qué medidas técnicas, ambientales, socio-culturales e institucionales se necesitan para una planificación justificada para el manejo de reducción de riesgos de inundaciones? Uno de estos medidas puede ser el rescate de los sistemas tradicionales agro-hidro-productivos (cultura de los Moxos). Los TdR para la EAE puedan dar pautas para qué paquetes de medidas alternativas deben ser comparados para llegar a una selección de un paquete preferido en términos de prioridad, sitio, escala y división en fases. Esto con el fin de formular un plan municipal con un compromiso óptimo entre una seguridad mejorada y los costos y beneficios ambientales y sociales.

Finalmente, la Comisión puede en sus TdR para la EAE asesorar sobre el componente 6) Coordinación, monitoreo y evaluación del Programa.

Agradeciendo su atención a esta carta, y esperando su respuesta concerniendo la propuesta de la Comisión, le saludo muy atentamente,

Ineke Steinhauer
Secretaria técnica
Comisión holandesa para Evaluación Ambiental

Estado Plurinacional de Bolivia

MMAyA
Ministerio de Medio Ambiente y Agua

La Paz, Septiembre 15 de 2011
MMAyA/VRHR Nº 1841/2011

Señora
Ineke Steinhauer
Secretaria Técnica
Comisión Holandesa para Evaluación Ambiental
Presente

Ref. Programa de "Prevención y Gestión de Riesgos de Inundaciones en las llanuras del Beni – Vivir con el Agua".

De mi mayor consideración:

Agradeciendo su atenta nota OS23-L10/IS/jz de 24.08.2011 comunico a usted la aceptación de la propuesta de la Comisión Holandesa para Evaluación Ambiental. A tal efecto agradecería se inicie preparaciones por una visita a Bolivia de la Comisión.

Sin otro particular, saludo a usted atentamente

Ing. Carlos René Ortuño Yáñez
VICEMINISTRO DE RECURSOS HÍDRICOS Y RIEGO
MINISTERIO DE MEDIO AMBIENTE Y AGUA

c.c. Arch. Corr.
COY/oms

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APPENDIX 2

Project information and composition of NCEA's working group

Proposed activity: The Beni lowlands in Bolivia, during the wet season, suffer from serious problems as a result of flooding. In El Niño and La Niña years, these problems are even more severe, with greater quantities of water and/or over a longer time span, causing victims and economic loss. Other problems were related to negative effects on the urban and rural population, health, the economic and social infrastructure, ecosystems and natural environment. With climate change and human interventions, the extremes of hydrological variations in the region are more intense and it can be expected that the above mentioned problems will be increasing, resulting in more severe flooding which takes longer. On the other hand, in the dry season, droughts are more prominent in the region, with greater risks for agricultural production, animal husbandry and the environment.

This situation not only requires emergency plans and contingency and reconstruction projects, but also a strategy of prevention and control to be implemented before disasters occur. This strategy is being developed through the 'Vivir con el Agua' program. This program consists of several components, which are intended to start a series of activities and interventions parting from the point of view of 'Living with Water'. The program counts with financial support from Netherlands and Belgian development co-operation. The Vice Ministry of Water Resources and Irrigation of the Ministry of Environment and Water has taken the initiative to undertake a Strategic Environmental Assessment (SEA) in relation to the Vivir con el Agua program.

Categories: DAC/CRS: 41010 Environmental policy and administrative management; 14010 Water sector policy and administrative management

Project numbers: Netherlands Commission for EA (NCEA): 091

Procedural information:

Receipt request for Advice	: July 2011
Site visit to Bolivia by the Working Group	: 2-10 November 2011
Submission of Final Draft Advisory ToR	: 1 December 2011

Composition of the working group of the Commission for EA:
Rudy Rabbinge (chairman)
Roel Slootweg
Hans van Maanen
Bert van Barneveld (resource person)

Bolivian counterpart team
Roger Torres VRHyR(Responsable del Programa)
Gloria Alcocer VRHyR
Antonio Reque (resource person)

Technical secretary:
Ineke Steinhauer

APPENDIX 3

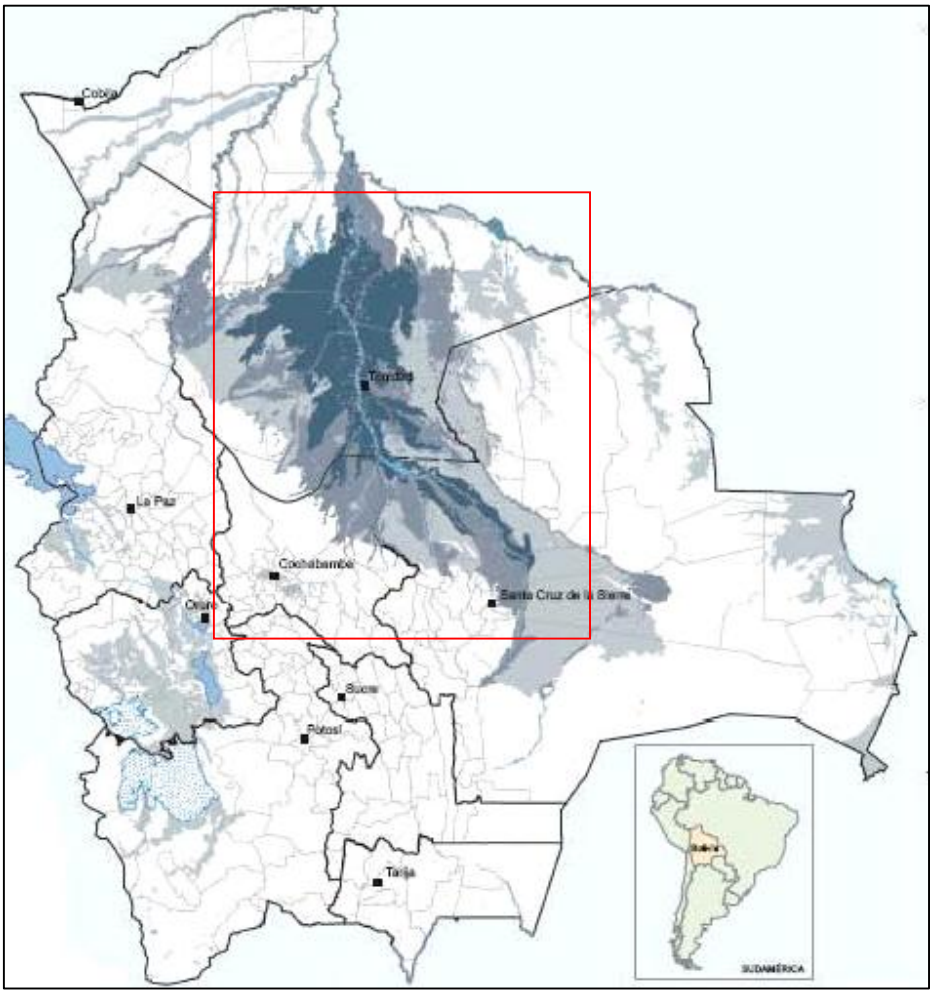
Working programme VIVIR CON EL AGUA – BOLIVIA
November 2-9, 2011

DATE	TIME	ACTIVITY
Thursday 3	09.00	**Place: Vice Ministry of Water Resources and Irrigation** Briefing with: Cynthia Silva, Vice Minister of Environment, Biodiversity, Climate Change and Forests, Luis Fernando Terceros, Eduardo Palma, Oscar Carrasco Roger Torres, Has Willet, Gloria Alcocer, Paola Padilla, Vice Ministry of Water Resources and Irrigation Rob van den Boom, Janette Trujillo, Netherlands Embassy
	11.00	Meeting with Jose Coello, Xavier Claros and Carlos de Ugarte (SERNAP, Protected areas) and representatives from both Vice Ministries as mentioned above
	15.00	Meeting with representatives of different organizations and representatives from both Vice Ministries as mentioned above: Iber Vargas, Jorge Aliaga, PRODENA Luis Chumacero, UNIL-VAPSB Daniel Virreira, LIDEMA Daniela Murillo, ADEMAF Stephan Beck, Insituto de Ecología Rosa Isela, Herbario Nacional Marcela Añez, WWF Giovanna Salinas y Giovanna Altuzarra, Plan Nacional Cambio Climático, VMA Antonio Reque, Fundación FASE Jose de la Cruz, SENAMHI
	17.00	**Place: Netherlands Embassy** Meeting with Rob van den Boom
	18.30	**Place: Hotel Radisson** Conference Rudy Rabbinge on food security and water use and availability, organized by National Academy of Sciences
Friday 4	06.30	**Flight** La Paz-Trinidad (NCEA and Gloria Alcocer, Roger Torres VMRHR and Antonio Reque)
	09.00	**Place: Fundación Kenneth Lee, Amazonía Sostenible** Meeting with Oscar Saavedra on the 'culturas hidraúlicas de los mojos' Visit to Loma Suarez and experiment farm ('camellones')
	15.00	**Place: COED (Centro de Operaciones de Emergencia Departamental)** Alfonso Salas, Secretary of Environment, Climate Change and Agricultural Development, Beni Government Luis Phillips, director COED Michael Nakamura Mauricio.., protected areas Carlos Ivan Hossen, spatial planning Alejandro…, director environment
Saturday 5	09.30	**Flight** Trinidad – Santa Ana de Yacuma (NCEA and VMRHR)
	11.00	**Place: Alcaldía Santa Ana** Meeting with Gustavo Humberto Antelo, Mayor of Santa Ana Carmelo Antelo, Sub-Governor of Yacuma Province and president of the Association of

		Cattle Breeders of Yacuma (AGAYAC) Walter Justiniano, technical staff municipality Mirko Nuñez and Sheyla Hortado, productive development unit of municipality Zamira Cortez, irrigation management of municipality Representative of Fundación Armonía para la conservación de la paraba Barba Azul
	13.00	**Visit to** anillo de circunvalación (elevated ring road) and San Lorenzo, camellones
Sunday 6	10.00	**Flight** Santa Ana- Trinidad (NCEA and VMRHR)
	14.30	**Place: hotel Campanario** working group meeting and report writing
Monday 7	08.30	**Place: Department of Spatial Planning, Beni government** Meeting with Carlos Ivan Hossen, Abelardo Limpios Olmos and Luis Ernesto Gutierrez
	10.30	**Place: Centro de Pueblos Indígenas del Beni** Meeting with 5 representatives of indigenous people
	11.30	**Place: Centro de Operaciones de Emergencias Departemental (COED)** Meeting with DRIPAD, Desarrollo Rural Integral y Participativo en Áreas Deprimidas of Beni Government Gustavo Urresti, Jenny Suarez Ardaya, Jessica Justiniano Costas, Carolina Velasco Velez, Arnoldo… and Juan Antonio… Meeting with Association of Fishermen, Roxana Nola Mapatoto, Marcela Cuellar and Raul Melgar Guasase
	13.30	**Meeting with Alfonso Salas,** Department of Natural Resources, Climate Change
	17.00	**Flight Trinidad-Santa Cruz** (NCEA and Roger Torres VMRHR)
Tuesday 8	09.00	**Place: FAN, Fundación Amigos de la Naturaleza** Meeting with Humberto Gómez, Verónica Ibarnegaray, Daniel Larrea and Alex Ovando
	11.30	**Working Group meeting:** report writing
	14.30	**Place: SEARPI, Servicio de Encauzamiento de Aguas del Río Piraí** Meeting with Kathia Lare and Ricardo Caballero
	21.00	**Flight Santa Cruz – La Paz**
Wednesday 9	11.00	**Place: Netherlands Embassy, debriefing** Vice Minister Carlos Ortuño, Vice Minster Cynthia Silva Luis Fernanco Terceros, Roger Torres, Gloria Alcocer Rob van den Boom, Janette Trujillo

APPENDIX 4

Map of the Area



APPENDIX 5

Planning and budgeting for participation/consultation

Step 1) Identify the key stakeholders and announce start of process. Consider:

- Who is affected by the Vivir con el Agua program /SEA (who are the potential winners and losers amongst government, local inhabitants, private sector?)?
- Who has a role in deciding on priorities?
- Who should provide input to the program/SEA?
- Who is crucial to successful plan implementation (Who pays for plan implementation? Who implements? Who are the enforcers and watchdogs?)

For the SEA for Vivir con el Agua, use can be made of the following identification and classification of stakeholders by way of example (to be completed and adjusted by the SEA expert).

	Stakeholders	Active	Passive	
			Directly Affected	Indirectly Affected
Primary	• Ministry of Environment and Water (VRHR)			
	• Ministry of Environment and Water (VMABCCDF)	+++		
	• Ministry of Planning	+		
	• SERNAP (National Agency for Protected Areas)	++		
Secondary	•			
	•			
	•			
	•			
	•			
	•			
	•			
External	•			
	•			
	•			
	•			
	•			
	•			

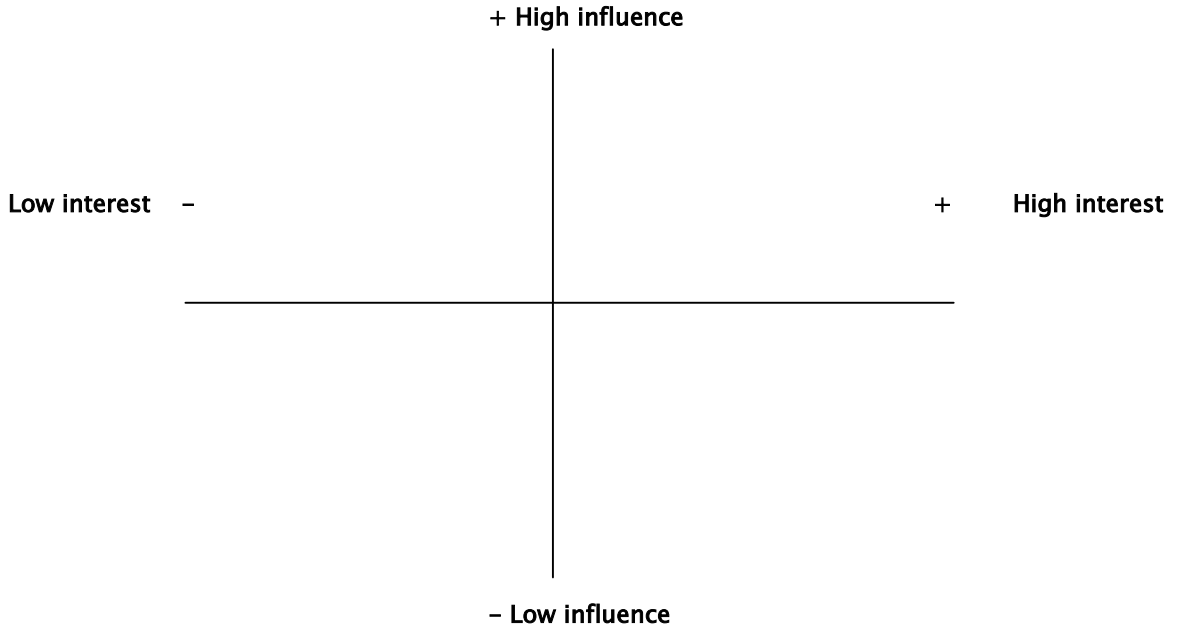
- *Active = those who affect a decision or action*
- *Passive = those who are affected by the decision or action*
  - *Directly affected (benefit or loose)*
  - *Indirectly affected (intermediary organizations)*

- *Primary stakeholders = intended beneficiaries*
- *Secondary stakeholders = other stakeholders*
- *External stakeholders = not to be involved but interested*

+++ Very high
++ Moderate
+ Low

Step 2) Assess the interest and influence of selected stakeholders

Categorize the identified stakeholders in the following diagram. This is meant to evaluate the interest and influence of stakeholders and may help prioritize the involvement of stakeholders in case of limited time or resources:



Interest refers to the interest, or stake, of stakeholders in the objectives of the plan/SEA:
+ = High interest and sympathetic to the objectives – the stakeholders also want what the plan/SEA is trying to achieve
- = Low interest or negative – where the SEA/plan objectives are irrelevant or against the interests of these stakeholders
Influence is the power, which stakeholders have over the plan/SEA, e.g. control what decisions are made, facilitate its implementation or exert influence negatively (oppose or obstruct). Influence may derive from the nature of a stakeholder's organization, their position in relation to other stakeholders and informal forms of influence (for example personal connections to ruling politicians).

To this diagram, some other dimensions may be added to fine-tune the assessment of stakeholders:
Importance: Indicates the priority given to satisfying stakeholders' needs and interests through the plan/SEA. It refers to those stakeholders whose problems, needs and interests are the priority of the plan/SEA. In the **interaction analysis** an assessment is made of the ability and openness of stakeholders to liaise, communicate, collaborate and co-ordinate with other stakeholders.

Step 3) Engagement plan for selected stakeholder groups. Consider:

- Why this group needs to be involved in the plan/SEA? What do you want to achieve with their involvement, and what might they want to achieve through involvement?
- How can they best be involved?
    - What is your 'message' for them
    - By what means you will communicate with them
    - What is the appropriate language/key triggers for their attention

- Who do you need when in the SEA/plan process? What outputs/information from the SEA do you need to provide to them, and when? Also, when do you require their feedback or input on SEA activities?
- Engagement on what: level of detail, adequacy of information, objectives and criteria, on what is 'significant'? Other purposes can be: let steam off and sense the emotions, prepare people for next steps in plan development, survey ideas (e.g. local values or on strategic issues).
- Decide on participation methods/techniques depending on purpose of involvement, education level and size of the study area
- Obtain commitment of stakeholders to participate, involve people timely, i.e. when options are still open and ensure sufficient feedback and mechanisms to consider outcomes
- Funding, timing and organization to achieve the above.

Specific requirements in the framework of the ILO Convention

The International Labour Organization (ILO) Convention (No. 169) concerning Indigenous and Tribal Peoples in Independent Countries, ratified as a Bolivian law, establishes in the article 6 that the Governments shall:

- Consult the peoples concerned, through appropriate procedures and in particular through their representative institutions, whenever consideration is being given to legislative or administrative measures which may affect them directly;

- Establish means by which these peoples can freely participate, to at least the same extent as other sectors of the population, at all levels of decision-making in elective institutions and administrative and other bodies responsible for policies and programs which concern them.