Collaborative Project

Role **O**f **B**iodiversity **I**n climate change mitigatio**N**

ROBIN

D3.1.3: Methods and results from the first and second round of local stakeholder meetings

GA number: 283093
FP7-ENV-2011.2.1.4-1

SEVENTH FRAMEWORK PROGRAMME

Start date of project: 01 November 2011 Duration: 48 months
Due date of deliverable: 30 June 2014 Actual Submission date: 22 Oct 2014

Lead partner for deliverable: UPM
Authors: Consuelo Varela-Ortega, Irene Blanco, Rhys Manners, Paloma Esteve, Kasper Kok, Marisol Toledo, Lucieta Martorano, Margareth Simoes, Fabio Diniz, Elena Lazos, Peter Gerritsen.

Dissemination Level		
PU	Public	x
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the Consortium (including the Commission Services)	
CO	Confidential, only for members of the Consortium (including the Commission Services)	

1. Executive Summary

Work package 3.1 in Module 3 of ROBIN aims to identify options for the integration of biodiversity and ecosystems and for land use optimisation in climate change mitigation through the development of participatory scenarios. The development of these scenarios is based on a series of stakeholder meetings that will contribute to improve understanding on current and future trends in socio-economic and ecological developments and climate change.

This report provides an overview on the process and results from the first and second round of stakeholder workshops held at the three ROBIN case study sites in Bolivia, Brazil and Mexico. The results from the first round of stakeholder meetings include the analysis of the current state of the local environment, while the second round was devoted to the development and analysis of scenarios to explore the perceptions and storylines of the stakeholders on the future state of the local environment. The global IPCC-guided socio-economic scenarios and policies selected for ROBIN in Module 2 (D2.3.1; Jones and Kok, 2013) were used as a framework for building down-scaled local scenarios. The two rounds of stakeholder meetings were organised to develop participatory Fuzzy Cognitive Maps (FCMs) (D3.1.2; Varela-Ortega et al. 2013) that would capture, respectively, the present and future perceptions of the stakeholders on their socio-ecological environment. The results of the FCMs of the present and the future presented in this report will form the basis for the third round of stakeholder meetings devoted to the identification of societal and policy-relevant options for integrating biodiversity in climate change mitigation. In addition, the results obtained in the participatory FCMs will be complemented and linked to the results of the bio-physical models developed in Modules 1 and 2 as well as to the results of the socio-economic models developed in WP3.1. These cross-module results will be discussed with the stakeholders for their validation and for identifying the best policy-relevant options for biodiversity-based climate change mitigation. These options will be presented in the final report of WP3.1 “Methods and results from the third round of local stakeholder meetings: identifying biodiversity-driven climate change mitigation options” (D3.1.4).

The report here presented is divided into two sections that correspond to the first and second round of stakeholder meetings respectively. **Section One** builds on the previous WP 3.1 report “A handbook to the participatory process in ROBIN: Development of methods for local stakeholder meetings” (D3.1.2; Varela-Ortega et al. 2013) and analyses the current state of the local environment in the three case study sites of ROBIN (Ascensión de Guarayos, Bolivia; Chamela-Cuitzmala, Mexico and Flona Tapajós, Brazil). Using the participatory method selected in the mentioned report, the FCMs, the first round of workshops served to identify the main factors determining the current state of the social and ecological environment, according to the stakeholders' perceptions. **Section Two** focuses on the development of future scenarios at the local study sites in Bolivia and Brazil using also participatory FCMs and taking as a base the ROBIN IPCC-based scenarios that are summarised in the report “Scenarios for use in ROBIN” (D2.3.1; Jones and Kok, 2013).

In detail, in the first round of SH workshops (section one) each case study produced two FCMs that represented the present situation in the area, for which participants worked in two independent groups. To achieve a consensual representation of the present situation, a combined FCM was developed following a systematic approach, which permitted the dynamic analysis of the system, allowing one to see how changes in particular variables (drivers) translate to changes in other variables. Stakeholders in Bolivia, Brazil and Mexico identified

deforestation as the central factor in the FMCs of the present. However, differences arise among the three case studies when analysing the structure and functioning of the FCMs. While in Bolivia, the focus is on changes produced to the environment, such as deforestation, forest fires, slash and burn, and contamination, the Brazilian system focuses more on the underlying drivers of change, including the lack of efficiency in policies, lack of governmental co-ordination and lack of viable economic alternatives amongst others. The Mexican case represents a mix of both views mentioning deforestation and biodiversity loss, but also inadequate policies and management. Moreover, the Mexican stakeholders emphasised also the relevance of market demands as being one of the major causes of change. In addition to the already mentioned governance and policy coordination and implementation, agricultural expansion is considered in all three of the FCMs as being one of the strongest causes of deforestation in each site. The results of the dynamic analysis suggest that biodiversity loss and deforestation are likely to continue in the near future.

Section one also illustrates some of the features of the FCM method such as its ability to simulate the effect of isolated factors on the overall system. This type of analysis was used to assess the effect of changes in agricultural policies and in the implementation and coordination of laws in the Bolivian case study of Ascensión de Guarayos. The results showed that the implementation of adequate agricultural policies, jointly with the good coordination of policies and institutions, could lead to far less negative environmental consequences. This type of analysis will be explored in subsequent stages of the project as it is considered key for identifying potential climate change mitigation options and for evaluating synergies and trade-offs in between different ecosystem services (provisioning and regulating).

Regarding section 2, the participatory scenario development process carried out in the second round of stakeholder meetings in Bolivia and Brazil allows to structure the uncertainty associated with the future. It will also offer impressions of how stakeholders perceive the future, given the external drivers from global scenarios that are used to contextualise local future. For this, two IPCC-guided socio-economic scenarios, SSP1 and SSP4, were identified that were highly relevant to the Meso- and South American context in ROBIN. In a further step, they were down-scaled and contextualised to make them more relevant to the stakeholders at the local level.

As part of the workshops, stakeholders were asked, firstly, to validate the FCMs of the present that they had constructed in the first meeting. Secondly, stakeholders were asked to develop two FCMs of the future based upon the two aforementioned contextualised-SSP scenarios. These two scenarios represented antagonist visions for the future; one oriented towards high environmental protection and social equality (the “Desired future” scenario in Brazil, the “Good life” scenario in Bolivia), the other one oriented towards low environmental protection with high social inequality (the “Undesired future” scenario in Brazil, the “Bad life” scenario in Bolivia).

Focusing on the most positive future scenario (high environmental protection and social equality) results show that even if based on similar global scenarios, there are clear differences between the scenarios depicted for Bolivia and for Brazil. In both cases, Bolivia and Brazil, increased environmental awareness, control of corruption and adequate institutional coordination are considered key factors for moving towards a sustainable future. However, while the Bolivian scenario focuses more explicitly on sustainable agriculture and use of forest, the Brazilian one is more centred in policies, economic development and social welfare. In the case of Bolivia, the necessary drivers to trigger sustainability and equity are those that provide alternatives to local economy through new infrastructures, access to credit or technical capacities. Meanwhile, Brazil focuses more heavily upon social and political drivers. In

particular, the FCM of the “Desired future” scenario includes increased social participation in policy development, higher environmental and social awareness, as well as a better articulation of public bodies, and demonstrate the vital nexus that social and policy factors have in this future.

Finally, it is important to note that the results provided in this report will serve as a basis for the identification of policy options and actions needed at the local scale for the conservation of biodiversity and the environment for climate change mitigation in a context of sustainable development (sustainable in socio-economic and environmental terms). In line with the results presented, potential options to develop may include a more active involvement of society in planning and management decisions, a search for sustainable economic activities that may contribute to alleviate poverty, and improvements on environmental awareness, education and technical capacities. These will be elicited, analysed and developed under different activities of WP3.1 and in collaboration with other WPs, and will include a third round of stakeholder meetings (in some of the cases), activities directed towards the analysis of ecosystem services, and research carried out at higher scales of analysis such as bio-economic modelling at provincial level or econometric modelling of deforestation and agricultural expansion at national level.

D3.1.3 Methods and Results from the first and second round of local stakeholder meetings

Created and maintained by Rhys Manners, Consuelo Varela-Ortega, Irene Blanco, Paloma Esteve

Version control	Edited by	Date of revision
Created – V1	Rhys M, Irene B, Paloma E, Consuelo VO	30th June 2014
Revised	Terry Parr	17th July 2014
Revised	Marisol Toledo	17th July 2014
Revised	Paloma E, Irene B, Rhys M, Consuelo VO	18th July 2014
Revised	Eleneide Doff Sotta, Lucieta Martorano	19th July 2014
Revised	Consuelo VO, Irene B, Paloma E, Rhys M	31st July 2014
Approved	Project Board	21st October 2014
Signed off	Terry Parr	22nd October 2014

Content

List of Figures

List of Tables

2. Introduction

2.1 Objectives

The objective of this deliverable is to develop and analyse qualitative and semi-quantitative participatory and integrated models (Fuzzy Cognitive Maps) based upon stakeholder interpretation of their socio-ecological and human environment. These models will serve to characterise the current and future state of the environment, land use changes and biodiversity, as well as societal and human well-being, in the three selected local case studies in ROBIN. An improved understanding of current socio-environmental concerns and drivers of change and a description of alternative future developments will support the identification of potential solutions and policy options at different scales, contributing to the overall goal of WP 3.1 of ROBIN "Stakeholder-driven scenarios and options for biodiversity based climate change mitigation".
The deliverable will use methods and approaches for participatory processes as covered in detail by WP3.1 report "A handbook to the participatory process in ROBIN: Development of methods for local stakeholder meetings" (D3.1.2; Varela-Ortega et al., 2013).

2.2 Background

The preceding WP 3.1 report (D3.1.2) provided a review of the methodology used in the development of stakeholder-driven scenarios for ROBIN. It offered an in depth analysis of participatory scenario development, as well as specifically identifying a methodology suitable for ROBIN.

In ROBIN, the participatory scenario-building process consists of the three steps (Varela-Ortega et al., 2012): first, in order to understand why stakeholders think the future might evolve in a certain way, a thorough understanding of their view of the present system is needed. Second, scenarios will be used for long-term future explorations, due to the uncertainty related to the future of the climate, environment and human development; scenarios are the best tools to structure the uncertainty. These long-term scenarios offer stakeholder's impressions of how the future might look, given the external drivers from global scenarios that will be used to contextualise local futures. Thirdly, they will inform short and medium-term policy and management options.

The method used in this participatory process will be Fuzzy Cognitive Mapping, combined with an external set of higher-level context scenarios such as those developed by the Intergovernmental Panel on Climate Change (IPCC). Fuzzy Cognitive Maps (FCMs) are a form of cognitive map or "mind map" useful for showing causal relationships between variable concepts (like social instability, rather than society), together with the strength of interaction between these variables. Fuzzy Cognitive Maps force the participants of the process to be explicit in their description of the system. With FCMs the purpose is to achieve a better understanding of the stakeholders' perception of both the present system and the system state in various future scenarios.

The previous deliverable outlined the results of preparatory stakeholder workshops that were performed in Bolivia and Mexico. The aims of the preparatory meetings were to contact,

engage and inform stakeholders of the participatory initiative of ROBIN, and to analyse past trends in relation to their socio-ecological environment. These workshops formed the foundation of the work highlighted and analysed within this deliverable, as well as provided a mutual understanding with stakeholders that was vital in the success of the meetings that followed and are herein explained. After extensive discussions with local teams and ROBIN partners, three case studies for developing local scenarios were selected: Bolivia, Mexico and Brazil. The following is a brief overview of the case studies and provides a review of a more in-depth analysis of these sites that can be found in ROBIN Deliverable D3.1.2.

2.2.1 *Bolivia*

The Province of Guarayos is located in the eastern department of Santa Cruz, and covers an area of 1,047,000 ha. Subsistence agriculture (rice, plantain, cassava, corn) remains the main economic activity, with livestock rearing, timber trade and small-scale manufacturing industries associated with oil palm and handicrafts also present.

Despite its abundance of natural resources, Guarayos is one of the poorest regions in the Department, with low levels of education and economic activities yielding low levels of income. Indiscriminate hunting, intensive land use and fires all threaten local ecosystems. A lack of appropriate management strategies and conservation policies have resulted in increasingly reduced levels of local biodiversity, insecure land tenure, depleted natural resources and high rates of deforestation.

Before the originally planned first SH workshop, a preparatory meeting was held to introduce the ROBIN project to stakeholders and to demonstrate the importance of local involvement and the participatory process within the expected results of ROBIN. The preparatory meeting took place on January 23rd 2013 at the Cultural Centre of Ascensión de Guarayos. During the meeting, participants were asked to identify environmental problems within the region, giving those involved the opportunity to discuss their perceptions of any problems.

Further information relating to this preparatory meeting can be found in the ROBIN deliverable D3.1.2.

2.2.2 *Mexico*

The Cuitzmala watershed is located in the south-western State of Jalisco. Forests in the surrounding region are found within a patchwork matrix of forest, arable land and pasture. The main economic activities within the region are agriculture, cattle ranching, forestry, fisheries and tourism. General income levels are relatively low, with unemployment prevalent but disguised by informal activities, migrations to the United States are commonplace. The main environmental issues within the area are deforestation and the expansion of grazing areas for livestock.

Similarly to the Bolivian case study, preparatory meetings were performed in Mexico in order to introduce the ROBIN project, its objectives, goals and the importance of local involvement in achieving these. The first meeting was held on the 26th January 2013 in Villa Purificación,

attended by over 50 individuals and the second on 28th January 2013 at the research centre of Chamela.

Further information relating to these preparatory meetings can be found in the ROBIN deliverable D3.1.2.

2.2.3 *Brazil*

The National Forest of Tapajós, in the State of Pará, was established in 1974 and covers 530,622ha. Tapajós is populated by 16 different communities, with the main productive activity in the region being agriculture. The inhabitants of the area are classified as low-income, with education levels being especially low. The main socio-ecological challenges in the region are the intensive use of land, agricultural expansion and increased land occupations.

The above factors have resulted in a high rate of deforestation, soil degradation, biodiversity loss and increased levels of poverty in the local communities. No preparatory meetings were performed in Brazil before the workshops.

2.3 Contents

This document is dedicated to covering and analysing the results of the stakeholder workshops held in the aforementioned case study sites. Workshops were held to cover the present situation of the environment, as well as to investigate perceptions of the future using downscaled scenarios. Workshops were performed in each of the three sites to cover the present. The second workshop, focusing on the future, will be analysed and included within the subsequent deliverable D3.1.4.

This deliverable analyses the factors considered as important to the current state of the local environment by stakeholders. Further to this, the deliverable concisely combines and reviews the conceptual models (FCMs) elaborated by stakeholders to produce a model of both the present and the future in each country (excluding Mexico, for which results for the future are not presented here). In the case of Bolivia, further information garnered from *in situ* fieldwork has been used to enrich the final cognitive map. Where applicable, this deliverable reviews and comparatively analyses the results from each country to identify any patterns or notable differences in the perceived factors and causes of change within respective environments.

The analysis herein described is performed for the present, and for the future scenarios developed by stakeholders in Bolivia and Brazil. In analysing the future, comparisons were made not only between the countries, but also between the two scenarios names: desired/ undesired in Brazil, and good-life/ bad life in Bolivia.

The analysis of the FCMs is complemented by a review of evaluations given by stakeholders at the conclusion of each workshop. The evaluations covered a wide range of fields from the mechanics of the workshops, the methodology, its utility and its relevance to stakeholders in their professional lives. This analysis permits a review of the relative merits of the methodology and its perceived successes and failures within the workshops.

3. First stakeholder workshop: Describing the present

3.1 Bolivia

3.1.1 *Objectives and organisation of the workshop*

The objective of this workshop was to gain an understanding of the local perceptions of the present state of the environment, as well as to better understand what factors are considered locally to be the causes of changes to the environment.

The workshop was held on the 30th of January 2013, attended by 30 stakeholders from a range of interest groups including; Organisation Centre of Guarayo Native People (COPNAG), Forestry Services, Radio Mission, Tropical and Agricultural Research Centre (CIAT), Arado Foundation, Farmers Federation, Indigenous Forestry Association, Rio Blanco and Rio Negro Wildlife Reserve, Guarayos Timber Association (AMAGUA), Authority and Social Control of Forest and Land (ABT), Guarayos Indigenous Women Centre (CEMIG), Development Area Program (PDA), Guarayo Cattle Association (AGUAGUA) and Ascensión Inter-Ethnicity Centre (CIEA). An important stakeholder group that wasn't present were the Mennonites; unfortunately due to their culture few are allowed to involve themselves in such workshops.

The workshop was coordinated and facilitated by members of Universidad Politécnica de Madrid (Technical University of Madrid, UPM) and Instituto Boliviano de Investigación Forestal (Bolivian Institute of Forest Research, IBIF) and was divided into several working sessions. After an initial introduction about the ROBIN project, its aims and goals and a reminder about the preparatory workshop, the facilitators took the opportunity to discuss the expectations of the workshop and its benefits not only to ROBIN, but also to the participants themselves.

An opening session included a brainstorming exercise in which participants were offered the chance to discuss what they considered to be the problems associated with the current state of the local environment. Following the brainstorming exercise, the opportunity was taken to present the theory and methodology behind FCMs. The group was then divided in two, allowing for two FCMs to be produced and to ease the process of producing the conceptual models as part of the second working session.

The break-out session started by posing the participants the following question: 'What are the factors that-in your opinion-have influenced the natural environment as it is today?' In answering the question participants could identify the factors responsible for the present state of the local environment and rated their relative relevance. During the afternoon session, participants identified the links between the factors previously selected and suggested the strength and direction of these relationships (i.e. positive/direct relationship or negative/inverse relationship). Finally, the two groups presented and discussed the FCMs built in a plenary session.

3.1.2 *Identified issues concerning the state of the environment*

As mentioned previously, the first session started with a brainstorming exercise initiated by the question 'What are the current problems associated with the local natural environment?' in which the stakeholders mentioned the following issues:

- Deforestation
- River pollution
- Soil erosion
- Loss of value for nature
- Fire
- Illegal mining
- Air pollution
- Illegal and indiscriminate fishing
- Draining of natural lakes
- Indiscriminate hunting
- Pollution from agrochemicals
- Species extinctions
- Misuse of soils
- Poverty
- Improper use and management of water
- Illegal land trafficking
- Lack of legal security
- Modernisation of agriculture
- Lack of law enforcement
- Lack of knowledge of the laws
- Unplanned migrations
- Lack of institutional coordination
- Lack of policies

After this brainstorming, the break-out session started with the identification-in each group-of those factors associated with the current state of the environment. Each participant was offered the opportunity to suggest three factors that they considered to contribute to the present situation. Following this, participants were asked to suggest which factors in their opinion, had the greatest importance in determining the present state. The results of this activity can be seen in the two spider-grams below, representing the responses of the participants from both groups. The values displayed are standardised.

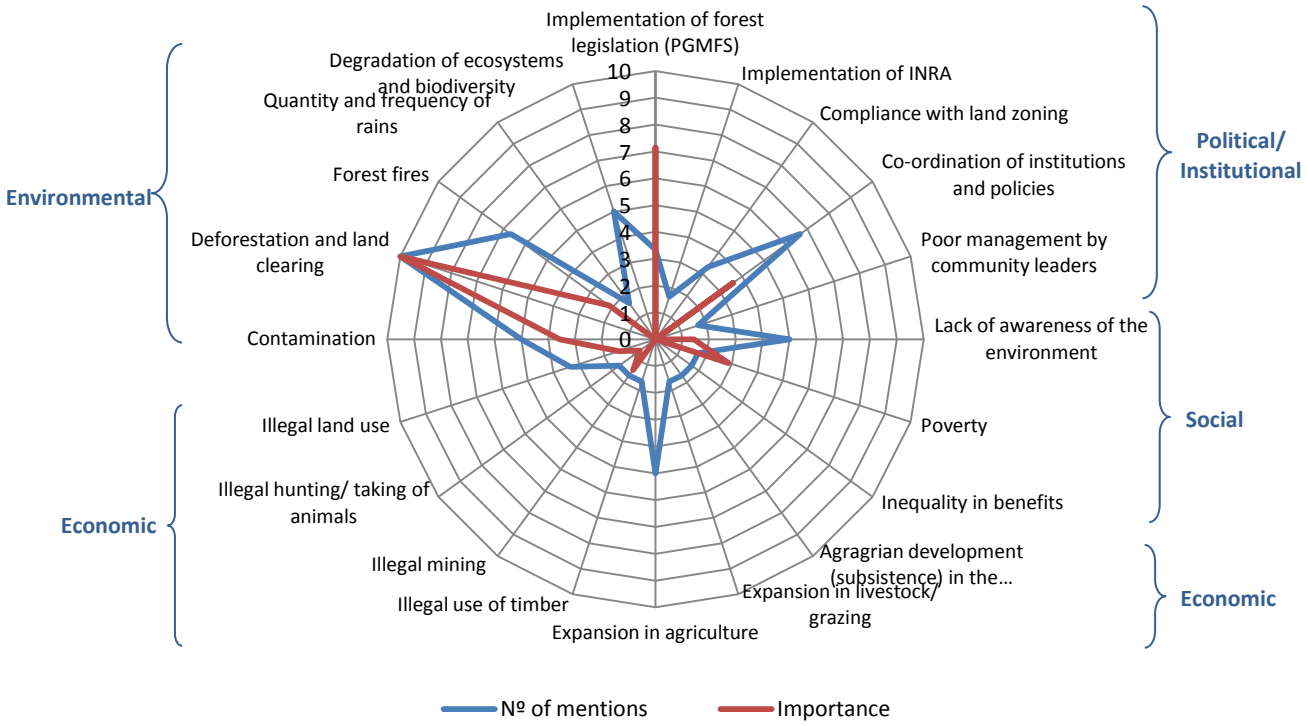


Figure 1. Spider-gram developed from Group 1's initial discussions concerning the state of the environment in Guarayos.

Figure 1 shows that from group 1 the most relevant issue concerning the state of the environment in Guarayos is deforestation and land clearing. This was the most mentioned factor as well as the one rated as most important. Besides this, forest fires and the coordination of institutions and policies were also highly mentioned. A not so mentioned factor that was, nevertheless, rated as highly relevant is the implementation of forest legislation.

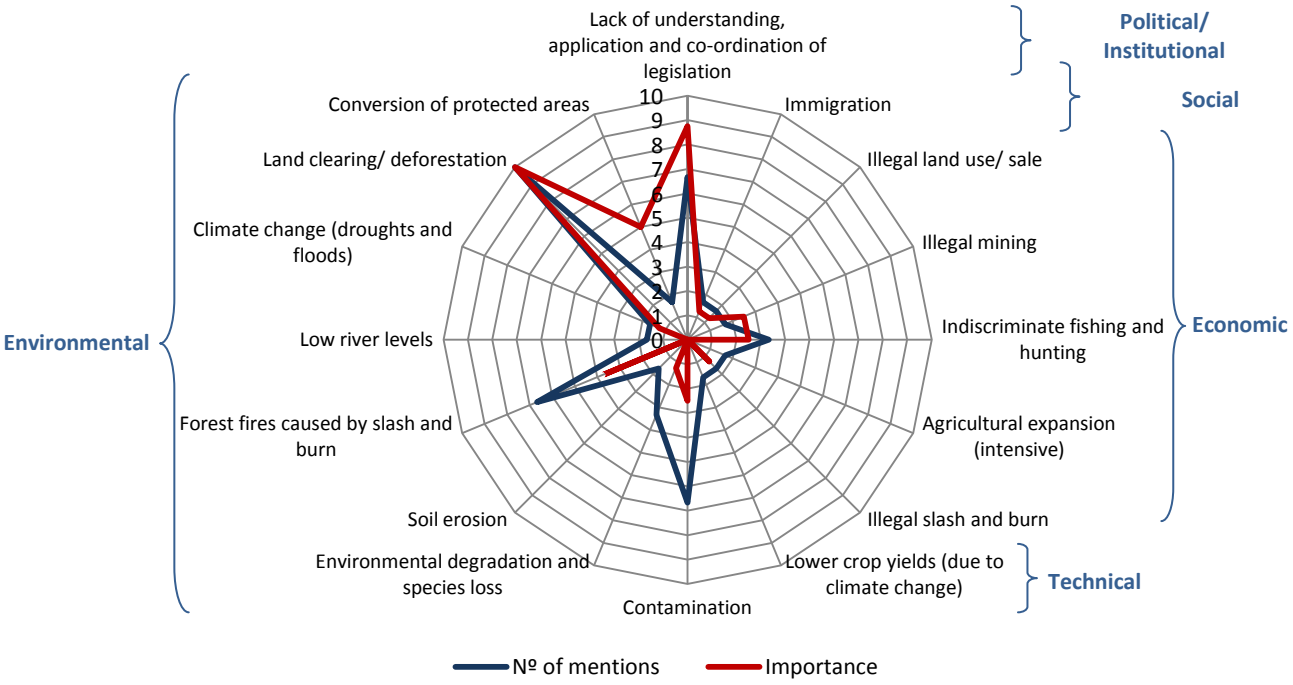


Figure 2. Spider-gram developed from Group 2's initial discussions concerning the state of the environment in Guarayos.

Results shown in Figure 2 reflect that group 2 also identified land clearing and deforestation as the most important factor with the highest number of mentions. Again, the lack of understanding application and coordination of current legislation was frequently mentioned and rated as the second most important factor. Forest fires and contamination were also frequently mentioned but they were not assigned a high level of importance.

The most important factors in both groups relate to the following areas: environment, economics, social and political/ institutional. However, Group 1 did not mention factors related to technical issues, whereas Group 2 contained such factors. The most mentioned and important factors from the perspective of the stakeholders are highlighted in the following table.

Table 1. The most mentioned and most important factors mentioned in Groups 1 and 2 during the present workshop in Guarayos.

	Group 1	Group 2
Most Mentioned Factors	- Deforestation - Forest Fires - Co-ordination of institutions and policies - Degradation of ecosystems - Contamination - Expansion of Agriculture - Lack of Environmental Awareness	- Land Clearing/ Deforestation - Lack of awareness and co-ordination of laws - Contamination - Forest fires caused by slash and burn
Most Important Factors	- Deforestation - Application of Forest Law (PHMFS) - Co-ordination of Institutions and Policies - Contamination - Poverty	- Deforestation - Lack of awareness and co-ordination of laws - Forest fires caused by slash and burn - Contamination - Forest Fires

3.1.3 *Conceptual models (FCMs) and dynamic analysis of the present*

Building upon the list of identified factors and taking into account their importance, each group built a FCM in which the different factors were linked to each other and the strength of those links was quantified in relative terms. Figures 3 and 4 show the FCMs built by the two groups. In green is highlighted the central factor/s, in yellow the drivers of the system.

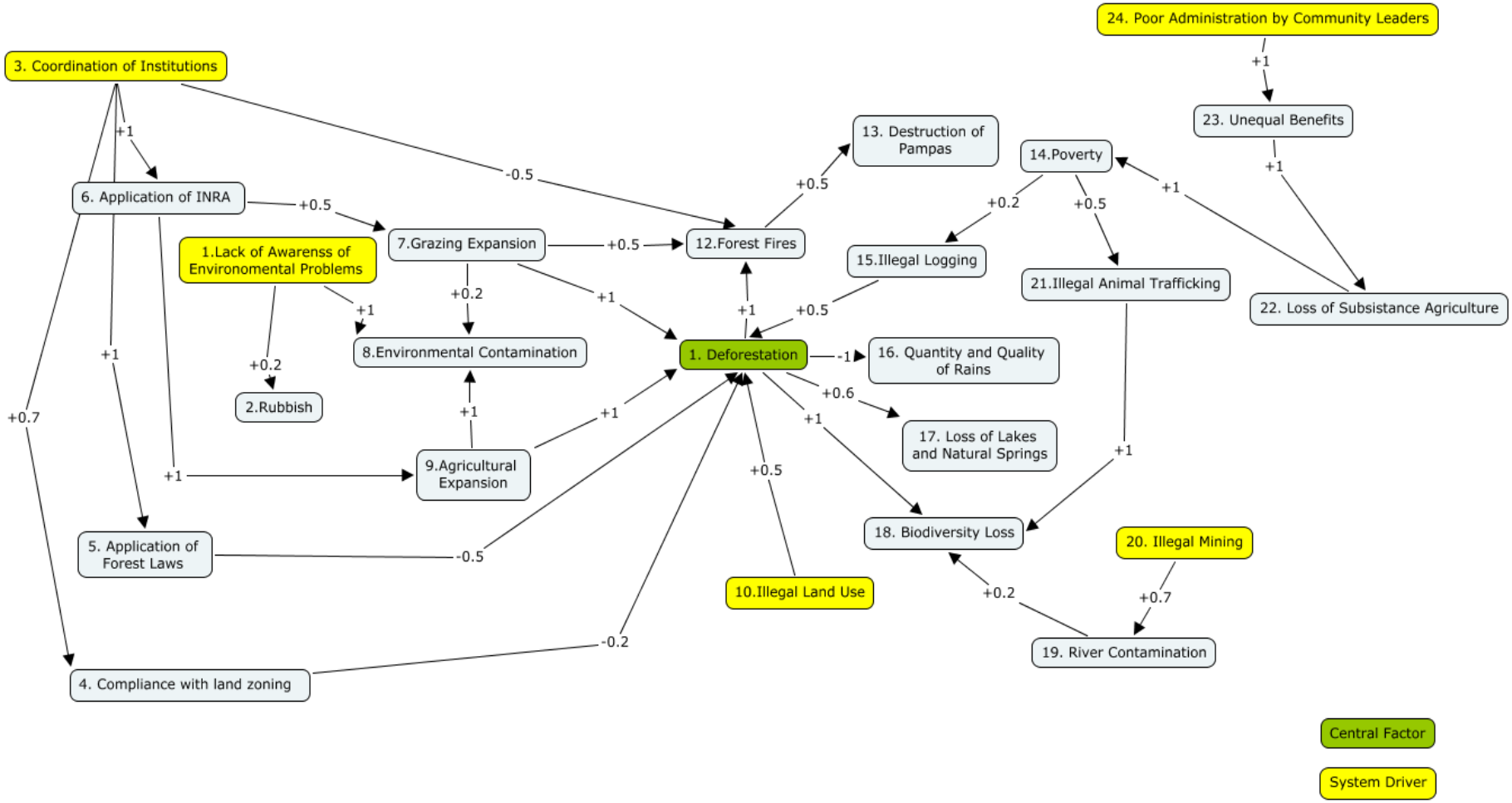


Figure 3. Fuzzy Cognitive Map made by Group 1 in Guarayos.

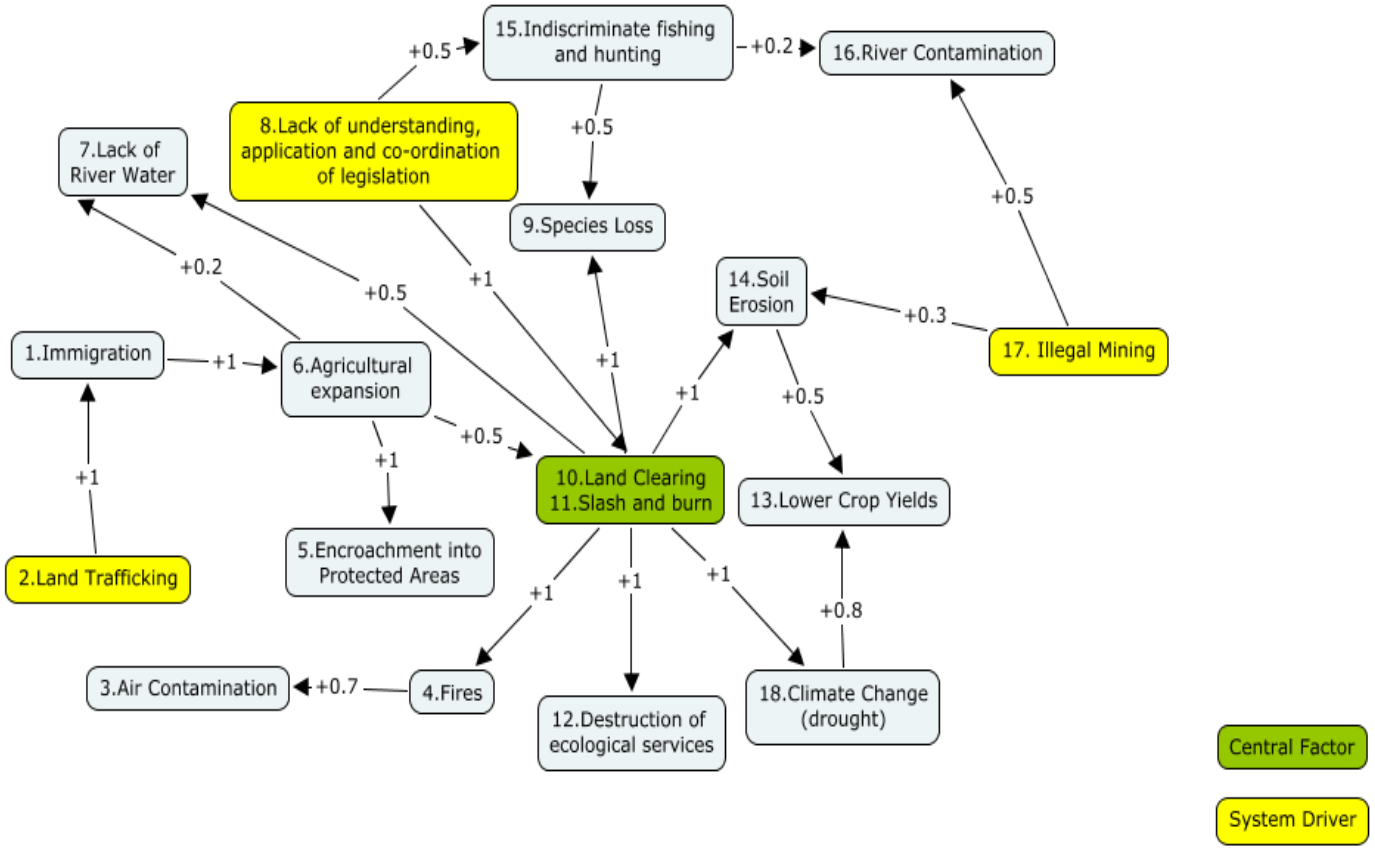


Figure 4. Fuzzy Cognitive Map made by Group 2 in Guarayos.

The FCM built by group 1 (Figure 3) includes 24 variables of which five are considered drivers of the system, by which is meant that they affect other variables but are not affected by any factor from those represented in the map. The drivers considered in this system are: the lack of environmental awareness, institutional coordination, illegal land use, illegal mining and poor administration of community leaders. The map has a cluster of policy issues including the effects of the INRA law (agricultural reform), the forest law (and forest management plans) and the land zoning (legal land uses). The INRA law favours the expansion of agriculture and grazing with negative environmental consequences including deforestation, which is a central factor of the map, and biodiversity loss. Another cluster of factors is devoted to social issues and relates to the management of indigenous communities, subsistence agriculture and poverty.

Group 2 (Figure 4) built a simpler FCM of 17 factors. The system represented is driven by three factors, namely land trafficking, the lack of understanding, application and coordination of legislation, and illegal mining. In this map forest clearing, i.e. deforestation, is also the central issue. The contents of the map are very similar to those considered in group 1, such as the agricultural expansion, forest fires, pollution, soil erosion and loss of biodiversity and of ecosystem services. However, this map shows a less detailed description of social and policy issues.

Both maps recognise the role of forests in regulating climate and water resources as an ecosystem service.

Once each group's views were represented in a FCM, it was necessary to achieve a consensual representation of the present situation in the case study of Ascensión de Guarayos. For this, we built a combined FCM following a systematic approach, which consists of two steps described below:

1. Selection of variables to include within the combined FCM: Selection was made by comparing the variables from both of the original FCMs. The common variables from both maps have been combined and renamed. The variables that appear in one of the maps have been included as they were in their original corresponding FCM.

2. Construction of combined FCM matrix: The adjacency matrix of the combined map, which describes the relationships between factors, has been formulated starting from the values of the relationships in the original maps. For those links considered in the two maps an average of the values assigned in the original matrices was used. For those relationships between variables considered only in one of the maps, the value of the relationship is equal to the one in its original matrix.

Having the combined adjacency matrix, we can build the complete FCM and perform the dynamic analysis of the system. The dynamic analysis of the FCM allows one to comprehend the system's dynamics, which is to say; one can see how changes in particular variables (drivers) translate to change in other variables. The analysis is based on matrix multiplication, where a 'state vector' or 'activation vector', which contains the initial values of the factors included in the map, multiplies the adjacency matrix resulting in a vector that shows the relative effects produced in the different variables. This vector multiplies again the adjacency matrix in an iterative process until the system's equilibrium is reached.

A calibration of the FCM is often necessary. It is assumed that the represented system is in equilibrium or near to equilibrium. Due to this, the system dynamic behaviour is expected to

converge to stable values. When such stabilisation is not achieved, or when the values reached do not seem to reflect real conditions according to the perceptions of stakeholders (SHs) and experts, a calibration of the map is required. Calibration often consists of the adjustment of the relationships between variables and their weights to make sure that the dynamic analysis of the system creates a more adequate description of reality.

Figure 5 shows the combined and calibrated FCM of the Ascensión de Guarayos case study, dynamic analysis of this FCM is shown in Figure 6. Figure 7 shows the total change produced to the different factors under the effect of the drivers of the system.

As shown in Figure 5, the combined FCM of Guarayos includes 27 variables taken from the individual maps of groups 1 and 2, some of them combined. From these, 6 variables act as drivers of the system: lack of understanding, application and coordination of laws, application of the INRA law, lack of environmental awareness, illegal mining, land trafficking, and poor administration by community leaders. Again, the central issue in this map is deforestation. Some of the causal relationships among factors are further clarified after calibration of the map. This is the case of the effect of the lack of coordination between policies. In this case the map represents this lack of coordination as the reason for the lack of implementation of the forestry policy. However, this does not affect the implementation of the INRA law, the objective of which is not in accordance with the goal of forest conservation plans.

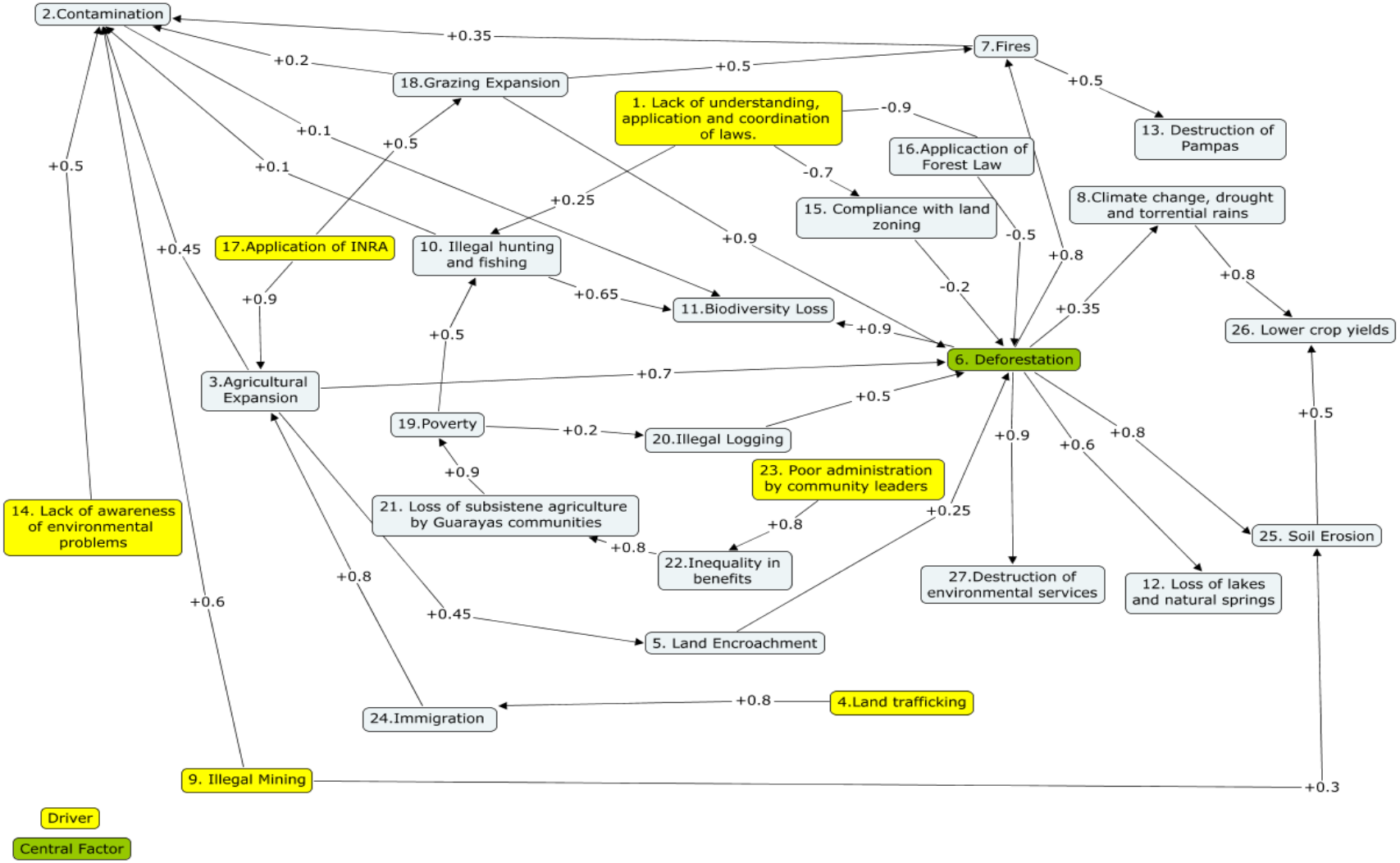


Figure 5. Combined FCM of Ascensión de Guarayos.

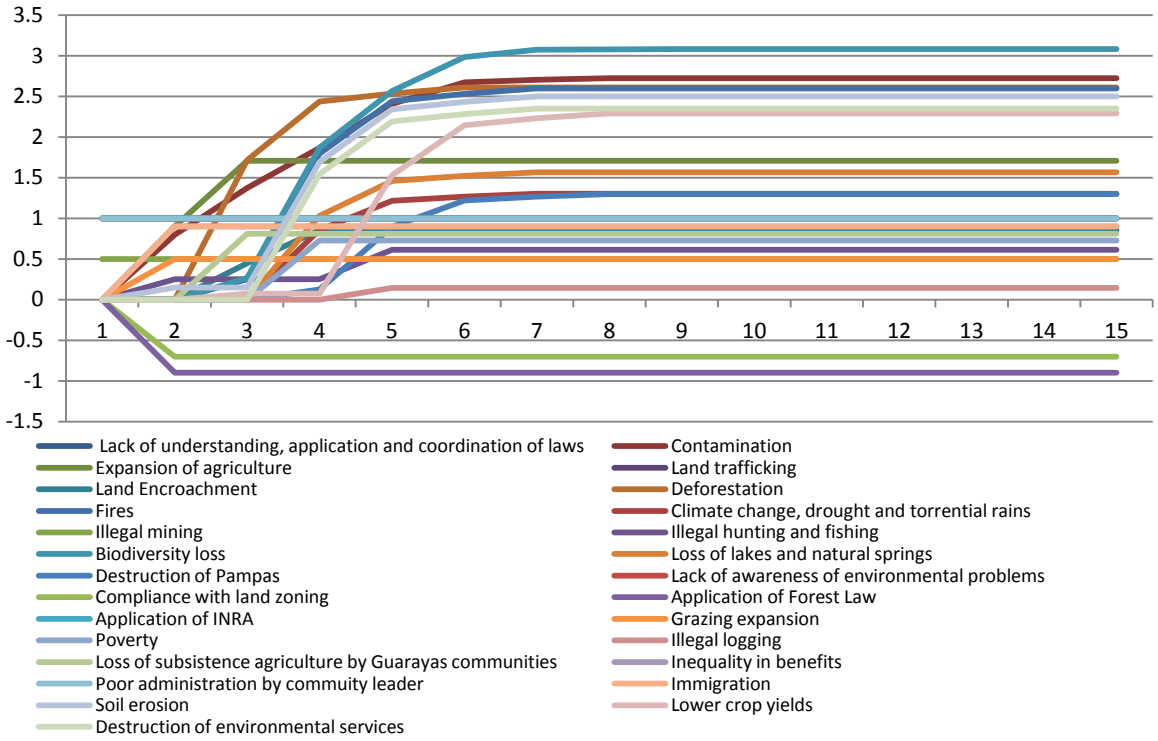


Figure 6. Dynamic analysis of the Ascensión de Guarayos combined FCM.

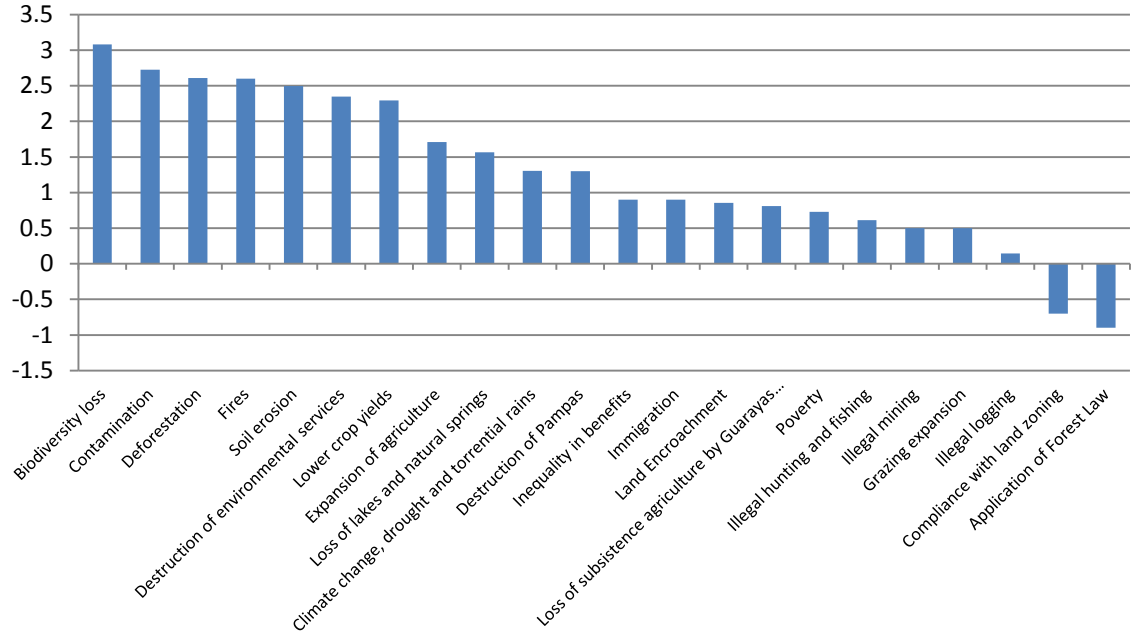


Figure 7. Total magnitude of the impact of drivers on each variable (combined FCM).

The dynamic analysis of the system in Guarayos (Figure 6) shows a system in which the principal effects are:

- biodiversity loss (magnitude of effect: 3.1)
- contamination of the environment (magnitude of effect: 2.7)
- deforestation and fires (both magnitude of effect: 2.6)

To a lesser extent, it is noteworthy that the results suggest that the Forest Law is not being implemented correctly (magnitude of effect: -0.9), nor are the restrictions of land zoning being adhered to (effect size: -0.7).

A key feature of Fuzzy Cognitive Maps is the possibility to simulate the effect of isolated factors on the overall system (Kok, 2009; Özesmi & Özesmi, 2004), using existing or new factors, such as the effect of new policies. Here we show an example of the effect of two drivers identified by the stakeholders and included in the FCM of Guarayos. These factors are the implementation of the INRA law and the lack of understanding, application and coordination of laws.

As background, the INRA law affects agrarian reforms within Bolivia. This law established the different types of private ownership of land and guaranteed the access of peasants and indigenous populations to land, regularising the situation of large land areas communally operated by different communities whose property rights were not formalised. According to the opinions of participants of the workshop, the effect of the implementation of the INRA law is described by the following causal chain (as taken from the FCM).

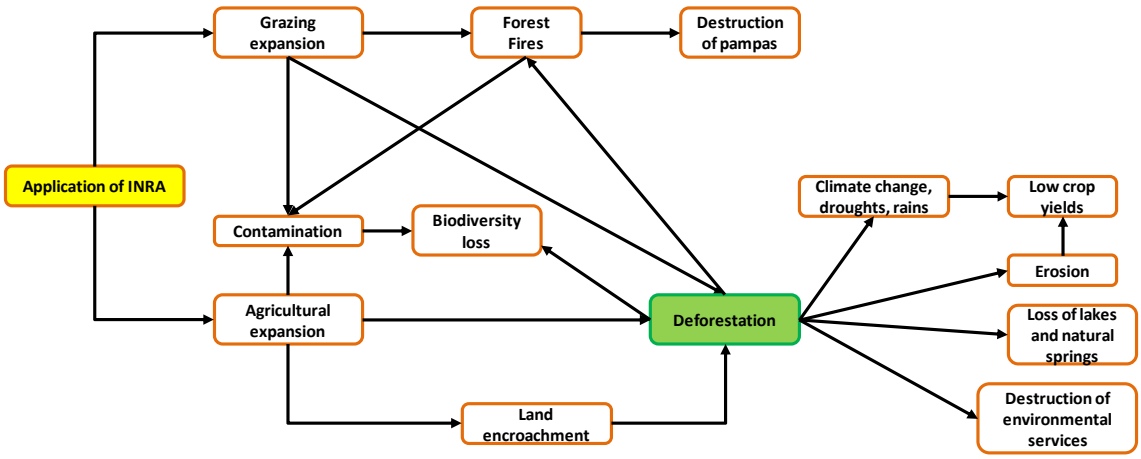


Figure 8. Causal chain of the effects of the implementation of the INRA law.

In the map built by the stakeholders the lack of understanding application and coordination of laws prevents the implementation of the forest law, reduces compliance with current land zoning, and fosters illegal hunting and fishing with negative consequences on biodiversity and forests. In this case we simulate what the effect of enhanced coordination and implementation of laws would contribute to improving the state of the environment in Guarayos, following the causal chain represented below (as taken from the FCM).

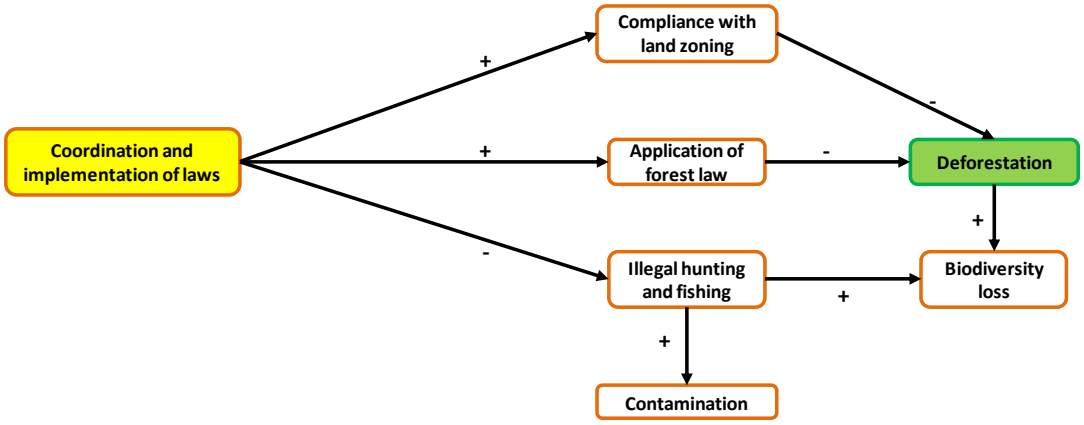


Figure 9. Causal chain of the effects of the coordination and implementation of laws.

Figure 10 shows the change experienced by the different factors of the system, when a) all the drivers of the system operate (Base), b) the INRA law is applied in isolation (this is the only driver that applies) (INRA law), c) there is coordination and implementation of laws in isolation (this is the only driver that applies) (Coordination), and d) the INRA law applies together with coordination and implementation of laws (other drivers do not apply) (INRA+ Coordination).

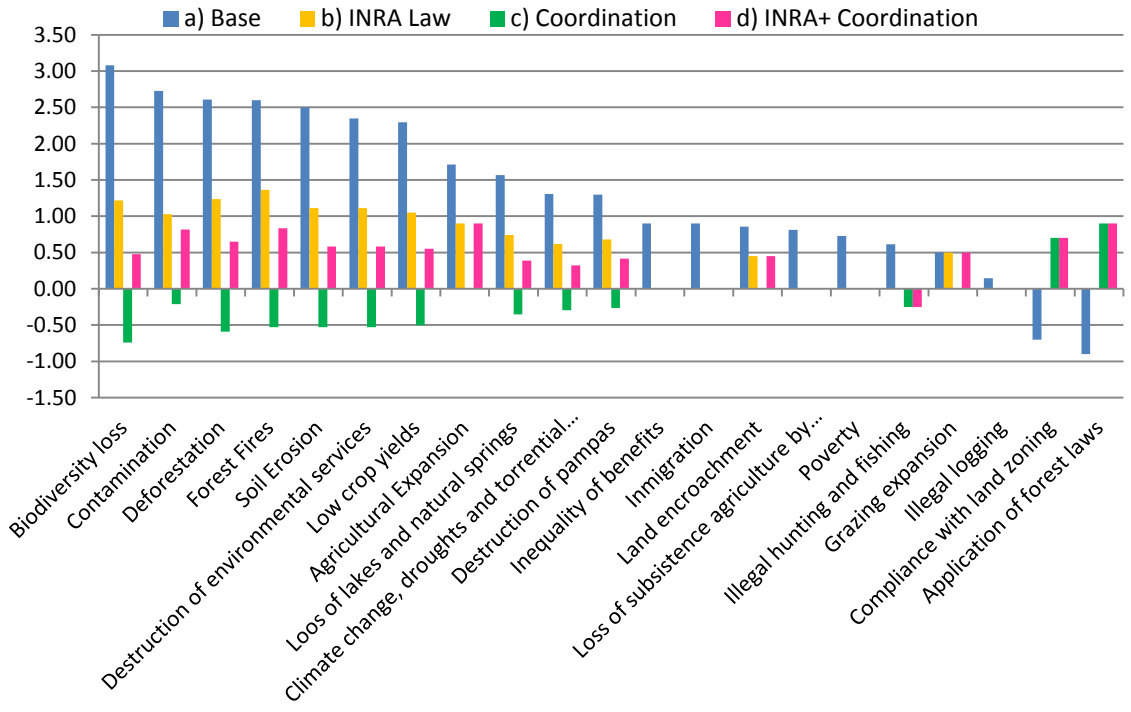


Figure 10. Comparison of the effects of different drivers

This figure shows in blue the changes produced on the system's factors when all the drivers are applied together. Then, when we look at the effect of the INRA law in isolation (yellow) we can see that this law is responsible for approximately half of the increase in negative environmental impacts, such as biodiversity loss, deforestation, forest fires, soil erosion, etc., and the sole cause for grazing expansion. Then, if we look at the effect of the coordination and implementation of laws (green), results show that if current policies were effectively implemented under the frame of coordinated policies and institutions it would produce a decrease in many of the mentioned negative impacts (i.e. there would be a decrease of biodiversity loss and deforestation, and environmental services would not diminish but they would increase instead). Finally, the implementation of the INRA law jointly with good coordination and implementation of policies (pink) would lead to far less negative environmental consequences than when applied without institutional coordination.

3.1.4 *Enrichment of the present: FCMs using field-work information*

The great potential of FCMs is that once you have built them you can add more factors if new stakeholders are included in the process, or if one wants to simulate the effects of specific actions or drivers (such as policies or other new drivers that may affect the system). In this case, we wanted to further specify the agricultural sector in the system, with it being one of the responsible sectors in forest degradation and deforestation.

From field work performed in the province of Guarayos, an analysis has been made of the most relevant issues mentioned by farmers and experts interviewed, and their relationship with the environment. The fieldwork consisted of 31 interviews with farmers and 3 interviews with experts. Based on the survey, farms have been categorised following a cluster analysis into four sizes (subsistence, small, medium and large) as shown in Table 2.

Table 2. Coverage of fieldwork interviews performed in the province of Guarayos, Bolivia.

	Interviews (No.)	Interviews (%)	Agricultural area interviewed (ha)	Agricultural area interviewed (%)	Type of agriculture
Subsistence (< 5 ha)	9	29	23	1.1	Subsistence
Small (5-49 ha)	9	29	177	8.5	Commercial
Medium (50-100 ha)	9	29	657	31.6	Commercial
Large (> 100 ha)	4	13	1225	58.8	Commercial
TOTAL	31	100	2082	100	

From the data obtained during the interviews, qualitative and semi-quantitative information has been selected to identify important themes that could be relevant for inclusion in the combined FCM. Table 3 shows a selection of information gathered from the interviews relating to perceived problems, risks and necessities for the farmers.

Table 3. Perceptions of problems, risks and necessities of different farmers, based upon farmed area.

	Most relevant laws or institutions	**Principal risks**	**Perception of climate change**	**Problems or necessities**
	Laws or institutions that directly influence agricultural development	Climate risks, diseases, or markets that most affect them	% interviewed that have perceived a change in the climate	Elements that they perceive are necessary for development of agriculture
Subsistence (< 5 ha)	INRA (land titling), prohibition of clearing, and slash and burn	Pests, torrential rains, and at times drought	11%	----
Small (5-49 ha)	ABT, commercial policies	Torrential rains and drought, lack of machinery	22%	Poor infrastructure (lack of financing), investments in soil drainage and irrigation, and insurance
Medium (50-100 ha)	ABT, commercial policies and credit	Torrential rains and drought, lack of machinery	55%	Access to credit and finance, insurance and a lack of diesel
Large (> 100 ha)	(It was mentioned the tax that has to be paid by producers farming more than 50ha and the obligation to have cattle, but these weren't majority opinions)	Excessive rain	50%	Insurance
	Elements currently included in FCM			**Elements not included in the combined FCM**

From the information contained in the Table 3, the principal factors related to politics, risks and climate change (shaded yellow) are already considered within the combined FCM (Figure 5). From the interviews it was continually stressed the importance that the lack of funding had in preventing investments to modernise agriculture. This lack of access to credit identified by the respondents (mainly small and medium commercial farmers) is seemingly essential and should be considered within the FCM. It has been considered that the lack of access to credit in the short and long-term impedes the modernisation and intensification of agriculture and in turn its expansion. This intensification and modernisation on the one hand will have a positive effect on crop yields and also on the local economy, but on the other, it will give rise to soil erosion and contamination. The following explains each new factor and its quantification:

- 'Lack of Credit': This factor is mentioned as a determining factor for the modernisation/ intensification of agriculture and inhibits the expansion of agricultural land for small and medium sized commercial farmers (up to 100ha). Of these farmers,

57% interviewed did not have access to credit to perform long-term investments. These farmers, that farm areas between 5-100ha, represent 40% of the entire area interviewed during the fieldwork. We have suggested that the weight of the relationship between 'lack of credit' and 'agricultural expansion' should be -0.25, calculated from (0.57*0.40). Further, of those 57% that don't have access to credit, 28% don't use fertilisers, if we assume that the use of fertiliser can be a proxy for intensification, we can establish a weight for the relationship between 'Lack of credit' and 'agricultural intensification' to be -0.5, calculated by (28/57).

- 'Agricultural intensification (agrochemicals and mechanisation)': Similar to as has been mentioned in point a), the field-work demonstrated that a lack of credit (short and long term) impedes the smaller and medium sized farmers from modernising/ intensifying their activity, limiting their access to agrochemicals, technology and machinery. This intensification however, does have consequences in improving crop yields. From the data obtained in the field concerning crop yields and the use of agrochemicals, it can be estimated that, in the cases of maize and rice, that more intensive production systems achieve yields 60% higher. From this, the weight of the relationship between 'agricultural intensification (agrochemicals, mechanisation)' and 'low crop yields' has been quantified at -0.6. The weight between the relationship of 'agricultural intensification (agrochemicals, mechanization)' and 'contamination' has been considered, and set to +0.3. There now also exists in the matrix a link between 'agricultural expansion' and 'contamination' with a weight of +0.5. It is supposed that a considerable percentage of this contamination, but not all, comes from the intensive use of agrochemicals, therefore a weight has been set at +0.3 for the relationship between agrochemicals and contamination.
- Unfortunately there wasn't sufficient data available to quantify the relationship between 'agricultural intensification (agrochemicals, mechanization) and 'soil erosion', nor for that matter between 'low crop yields' and 'poverty'. However, using experience gained in the study area and previous studies it has been determined that the following weights should be applied respectively to the previous two relationships: +0.2 in the first case and +0.6 in the second.

The combined and enriched FCM and dynamic analysis of Guarayos is shown in Figure 11 below. In green, the central factor of the system and in yellow, the drivers of the system. In blue, the new introduced factors, with new relationships in red. Figure 13 shows the total change produced to the different factors under the effect of the drivers in the original combined and the enriched system.

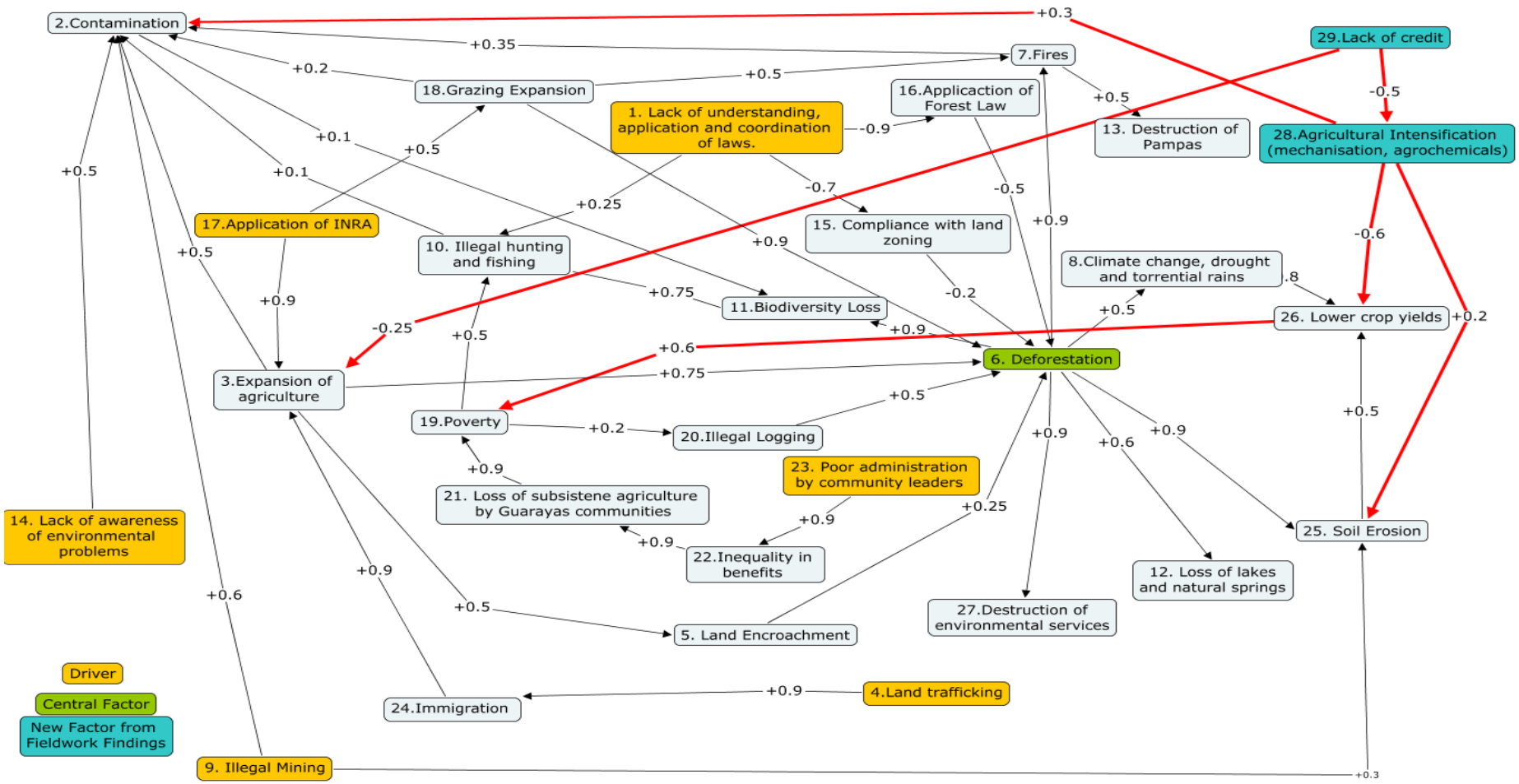


Figure 11. Enriched FCM of Ascensión de Guarayos.

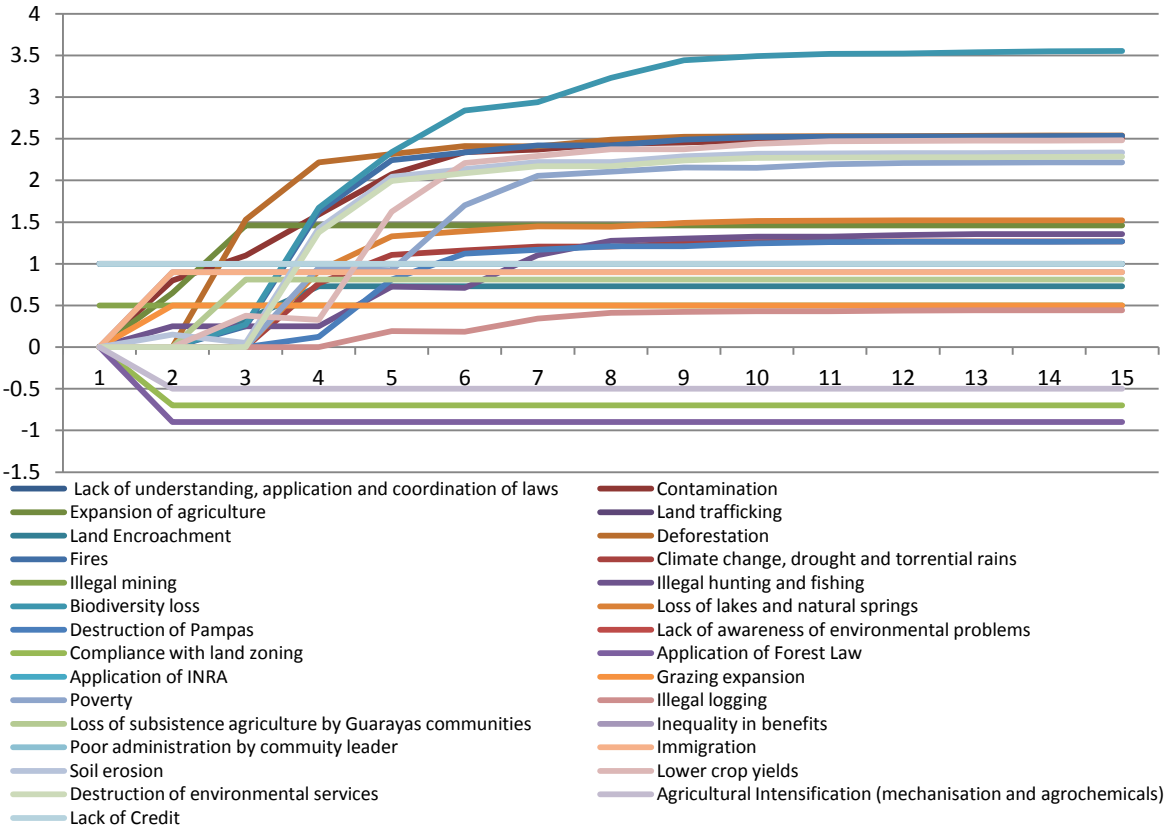


Figure 12. Dynamic analysis of the combined and enriched FCM of Ascensión de Guarayos.

The dynamic analysis of this model demonstrates a system, in which the principal effects follow the same direction than in the non-enriched system but magnitudes in some cases are quite different. The most relevant effects are:

- Biodiversity loss: with a magnitude of the effect of 3.56, greater than in the non-calibrated system
- Deforestation: with a magnitude of the effect of 2.54, lower than in the non-calibrated system
- Fires: with a magnitude of the effect of 2.54, lower than in the non-calibrated system

As compared to the non-enriched map, it should also be noted the greater increase of poverty, illegal fishing and hunting and illegal logging, and also a greater reduction in crop yields as a consequence of the lack of access to short and long-term credit. It is interesting to note the reduction in deforestation demonstrated by this enriched system, it suggests that in an under financed/invested system, deforestation is comparatively reduced. Therefore, an increase in credit availability may result in greater deforestation, as it facilitates greater agricultural expansion, and in turn further deforestation. Conversely, an increase in credit availability may also facilitate agricultural intensification and improved yields as previously mentioned, and from analysing the system in Figure 11, may result in reduced poverty and illegal logging and potentially reduced deforestation. Therefore, an increase in the availability of credit could have a potentially double-sided outcome, both positive and negative in terms of deforestation.

The total changes produced in the different factors (red) are shown in Figure 13 (below) and compared to the results of the analysis of the non-enriched map (blue).

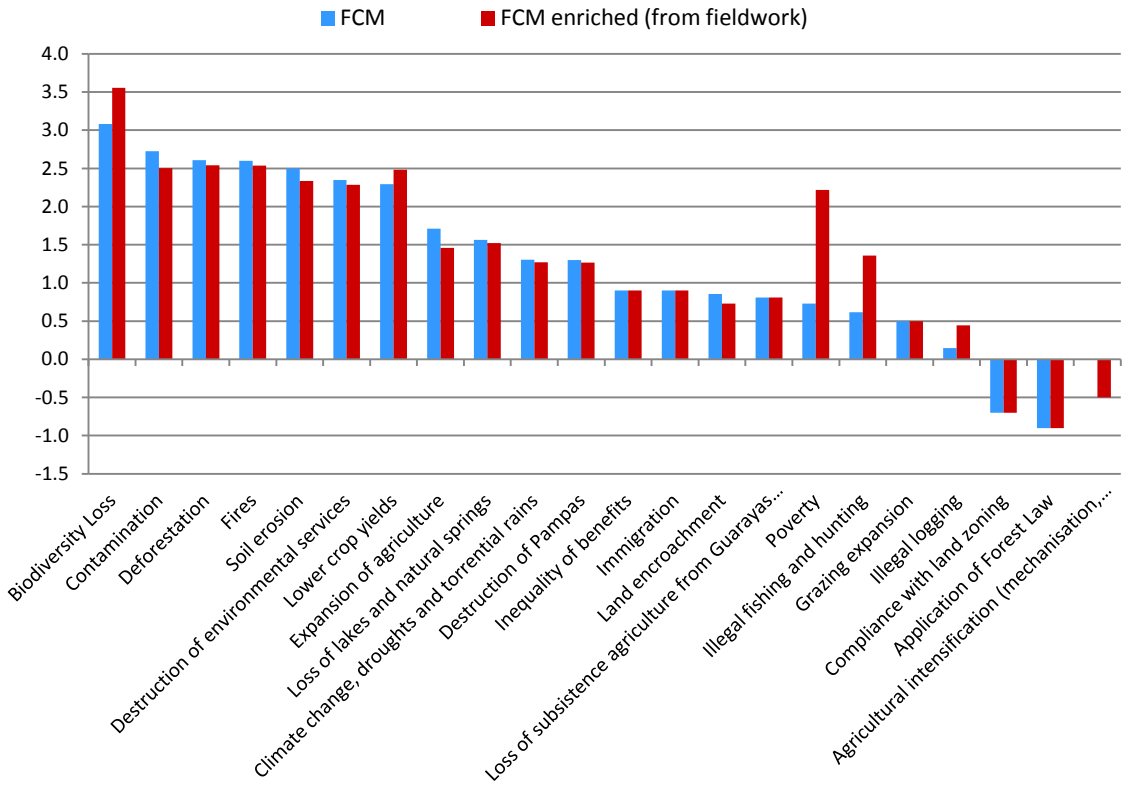


Figure 13. Comparison of the total magnitude of impact for each variable in the combined and enriched systems.

3.2 Mexico

3.2.1 Objectives and organisation of the workshop

The objective of this workshop was to gain an improved understanding of the local perceptions of the present state of the environment, as well as to better understand what factors are considered locally to be the causes of such changes.

The workshop was held on the 8th of March 2013 and was attended by 28 stakeholders, from a range of interest groups including government institutions, academics, local authorities, farmers and peasants. Unfortunately the majority of farmers invited did not attend.

The workshop followed a similar programme and methodology as explained in the Bolivian case, with small adjustments made to respond to the participants' background and the contents of the preparatory workshops.

The workshop started with an introductory session coordinated and facilitated by the teams of Universidad Nacional Autónoma de Mexico (UNAM) and UPM, in which participants of the workshop were introduced, and the importance of the workshop and its goals explained. The methods to be used were presented highlighting previous experiences in other workshops. After the presentations, participants were split into two groups, whilst trying to evenly distribute the participants to formulate the most diverse grouping of stakeholders in each group.

The break-out session, devoted to the construction of FCMs, started by questioning 'Which factors have influenced the present state of land use and of the environment during the past 50 years?' Participants highlighted which factors they considered to be the most important and reasoned the selection of those factors. After listing and clustering the most relevant factors, participants started to consider the existing links between these factors and the strength of the relationships between them. The workshop was concluded with a plenary, where both groups could present the results of their work, and the possibility for future work.

3.2.2 *Identified issues concerning the state of the environment*

As part of the opening session of the workshop each participant was offered the opportunity to suggest three factors that they considered to contribute to the present situation within the local environment. Following this, participants were asked to suggest which factors in their opinion had the greatest importance in determining the present state. The results of this activity can be seen in the two spider-grams below, representing the responses of the participants from both groups. The values displayed are standardised.

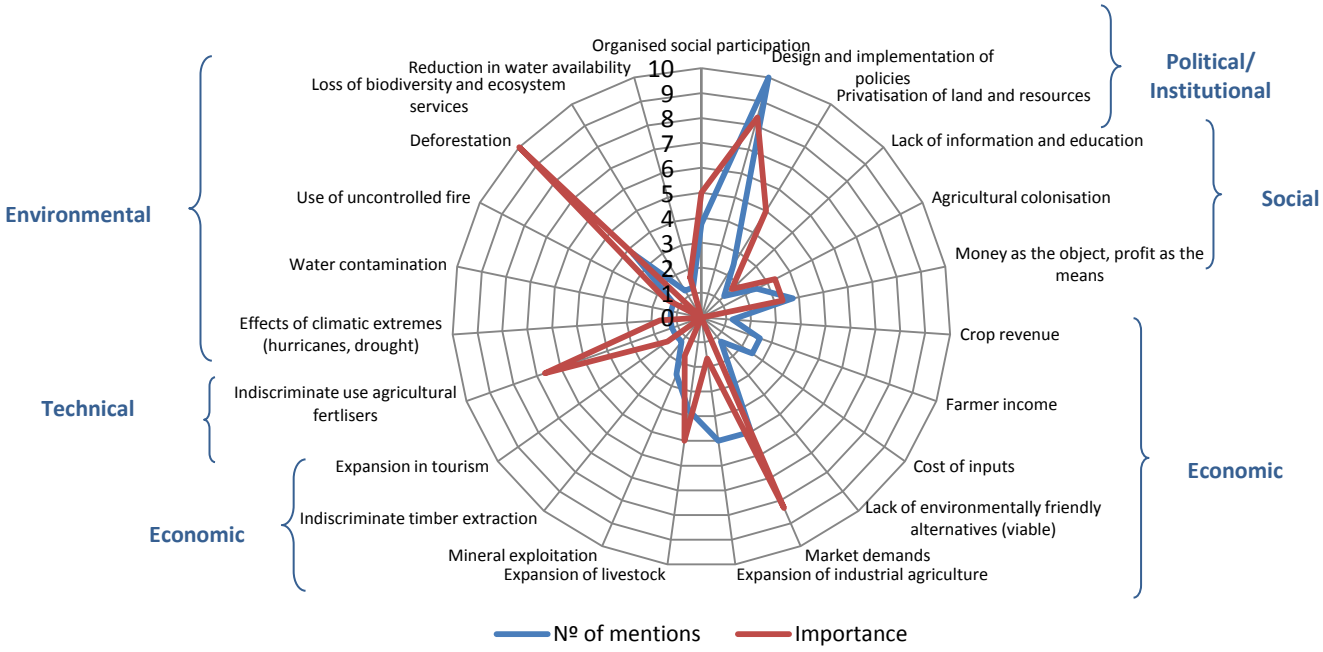


Figure 14. Spider-gram developed from Group 1's initial discussions concerning the state of the environment in Chamela-Cuitzmala.

As Figure 14 shows, participants from group 1 selected the design and implementation of policies as one of the key issues in the Cuitzmala basin, this factor being the most mentioned one. However, when asked about the relevance of the identified issues, stakeholders rated deforestation as the most important factor, followed by the design and implementation of policies and market demands. Among the selected factors the relevance of economic issues is clear.

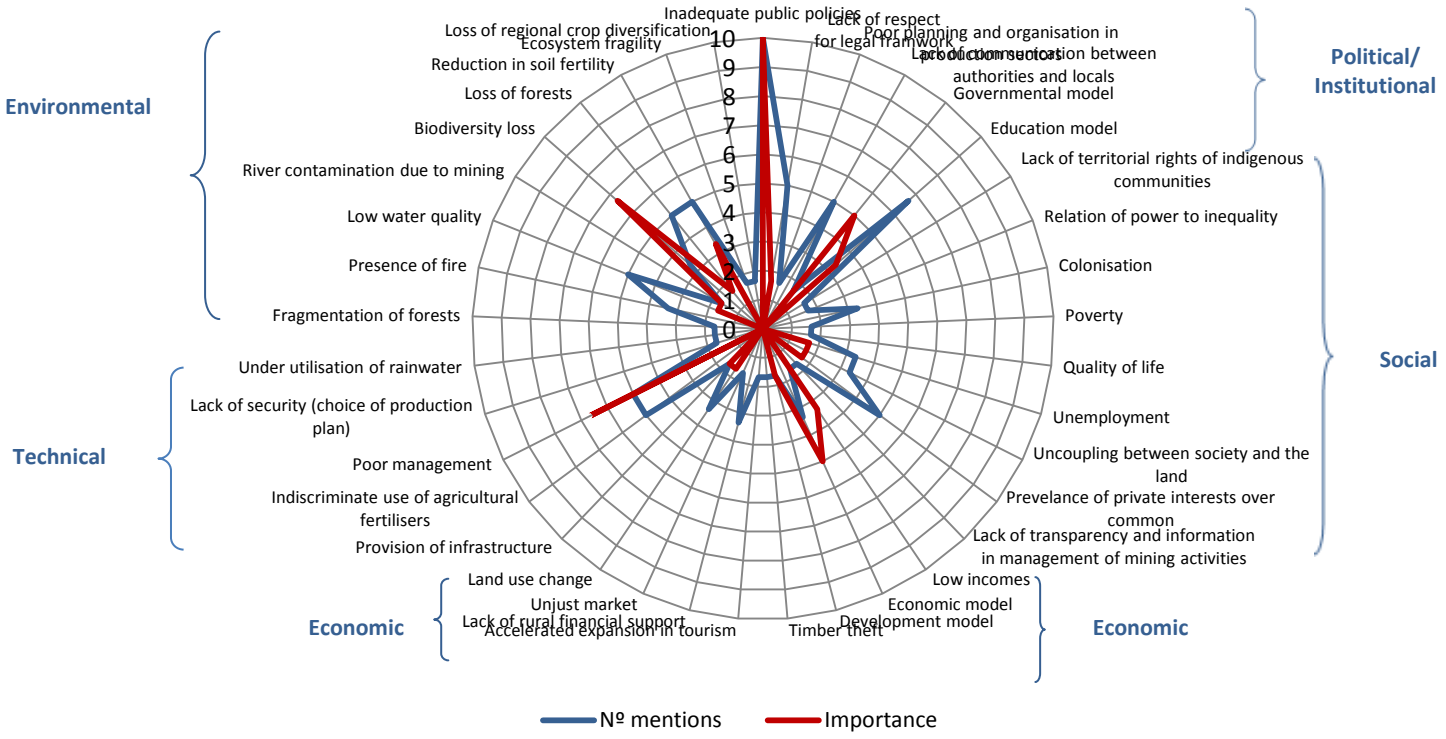


Figure 15. Spider-gram developed from Group 2's initial discussions concerning the state of the environment in Chamela-Cuitzmala.

The spider-gram of the factors identified by group 2 (Figure 15) shows that the inadequacy of public policies is perceived as the most relevant issue, being the most mentioned and the highest rated factor. Other frequently mentioned factors are the educational model, the loss of forests and the prevalence of private interest over common. Among the most important factors, besides the inadequacy of public policies, stakeholders selected biodiversity loss, poor management, governmental and economic models. In this group, however, stakeholders did not specify which elements from the governmental, economic and educational models are specifically problematic and/or relevant for the state of the environment in the study area.

The identified factors from Chamela-Cuitzmala principally relate to the areas of the environment and economics, and also to a lesser extent the areas of social, political/institutional and technical. The most mentioned and important factors from the perspective of the stakeholders are highlighted in Table 4.

Table 4. The most mentioned and most important factors mentioned in Groups 1 and 2 during the present workshop in Chamela-Cuitzmala.

	Group 1	Group 2
Most Mentioned Factors	- Design and implementation of policies - Markets demands - Expansion of industrial agriculture - Deforestation - Expansion of livestock - Search for money as the object and profit as the means	- Inadequate public policies - Education Model
Most Important Factors	- Deforestation - Market Demands - Design and implementation of policies - Indiscriminate use of agricultural fertilizers	- Inadequate public policies - Loss of Biodiversity - Inadequate management - Economic and governmental policies

3.2.3 *Conceptual models (FCMs) and dynamic analysis of the present*

Once the relevant factors were identified, each group started the building of the corresponding FCM. A number of issues arose during the workshop and subsequent analysis of the FCMs from Mexico.

The FCM for Group 1 has not been calibrated, and will be calibrated during the future scenario workshop in Mexico, thus allowing for simultaneous validation to be performed. Further to this, the FCM for Group 2 is not included within this document as due to time limitations it was not fully finalised within the workshop. This FCM, which is still under a finalisation and validation process, will be similarly completed and validated in the workshop. Both of these completed FCMs, along with the combined and completed FCM for Chamela-Cuitzmala will be included in a future deliverable.

However, as a means of comparison between the three case studies, we have included an uncalibrated map from Group 1 to offer an idea of the linkages between factors suggested during the first Mexican workshop. Figure 16 shows the FCM built by Group 1.The factors highlighted in green represent the central factors of the systems and in yellow the drivers. Figure 17 shows the dynamic analysis of the system being represented in the Group 1 FCM. Figure 18 shows the total change produced to the different factors under the effect of the drivers of the system.

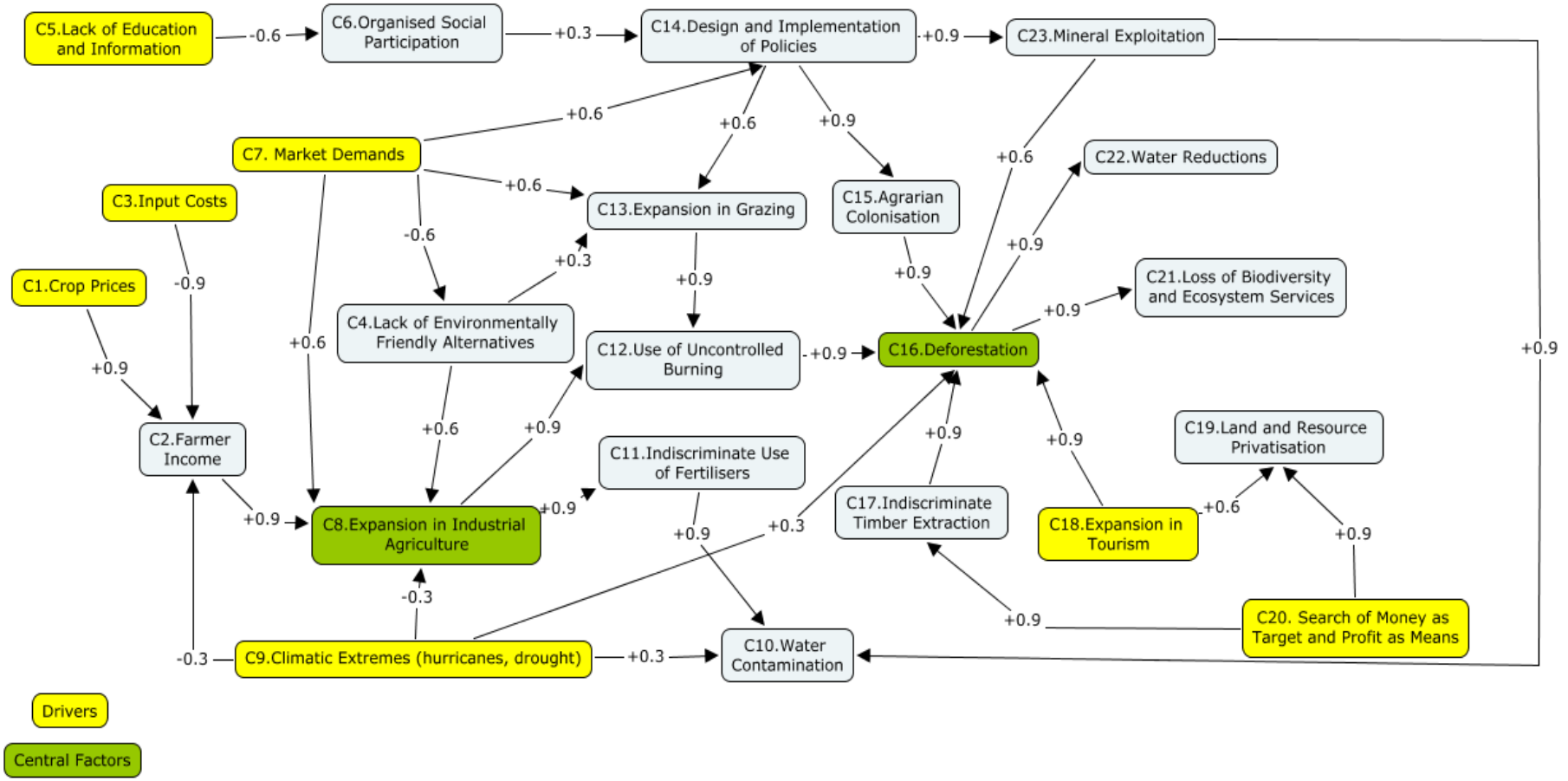


Figure 16. Fuzzy Cognitive Map made by Group 1 in Chamela-Cuitzmala.

The FCM built by group 1 shows a system of medium complexity without loops. The map includes 23 variables, of which 7 act as drivers of the system. These are mostly economic drivers (crop prices, input costs, market demands, and the expansion of tourism), social drivers (lack of education and information and the pursuit of profits as the key goal of society in the region), and one environmental driver (the occurrence of climatic extremes (hurricanes, droughts)). Deforestation and the expansion of industrial agriculture (intensive commercial agriculture) arise as central issues, showing a dichotomy in the area that represents the confrontation between the agricultural sector and environmental conservation.

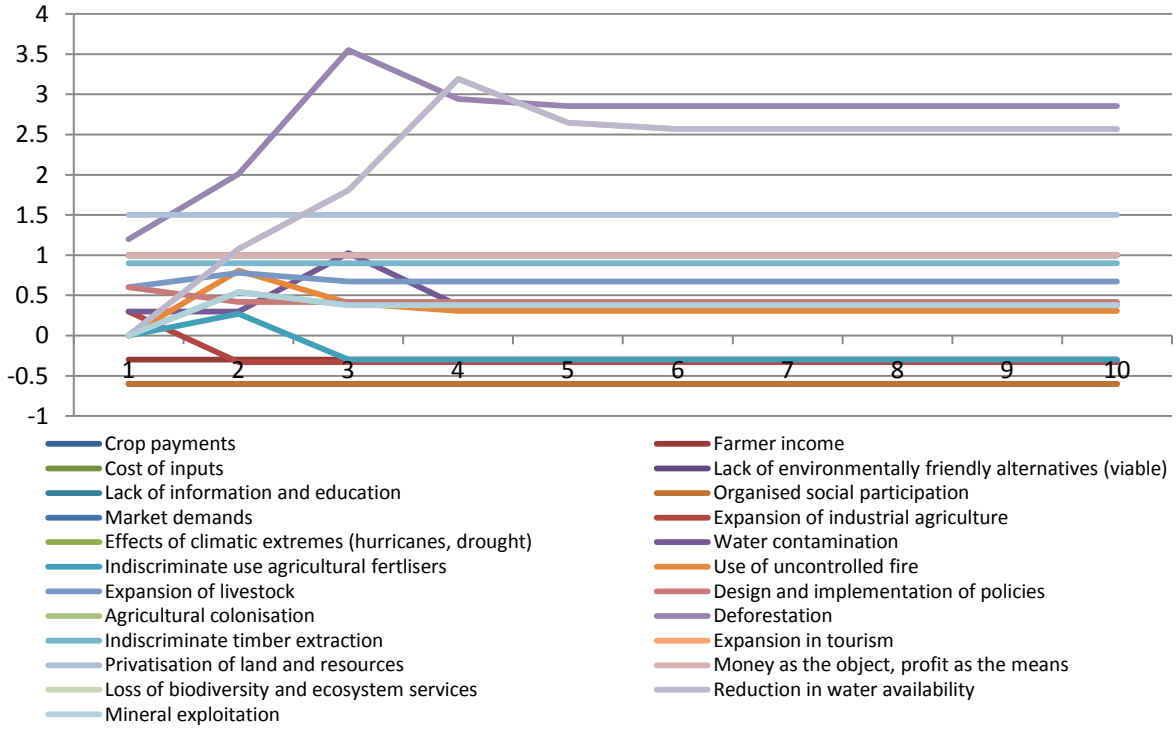


Figure 17. Dynamic analysis of Group 1's FCM.

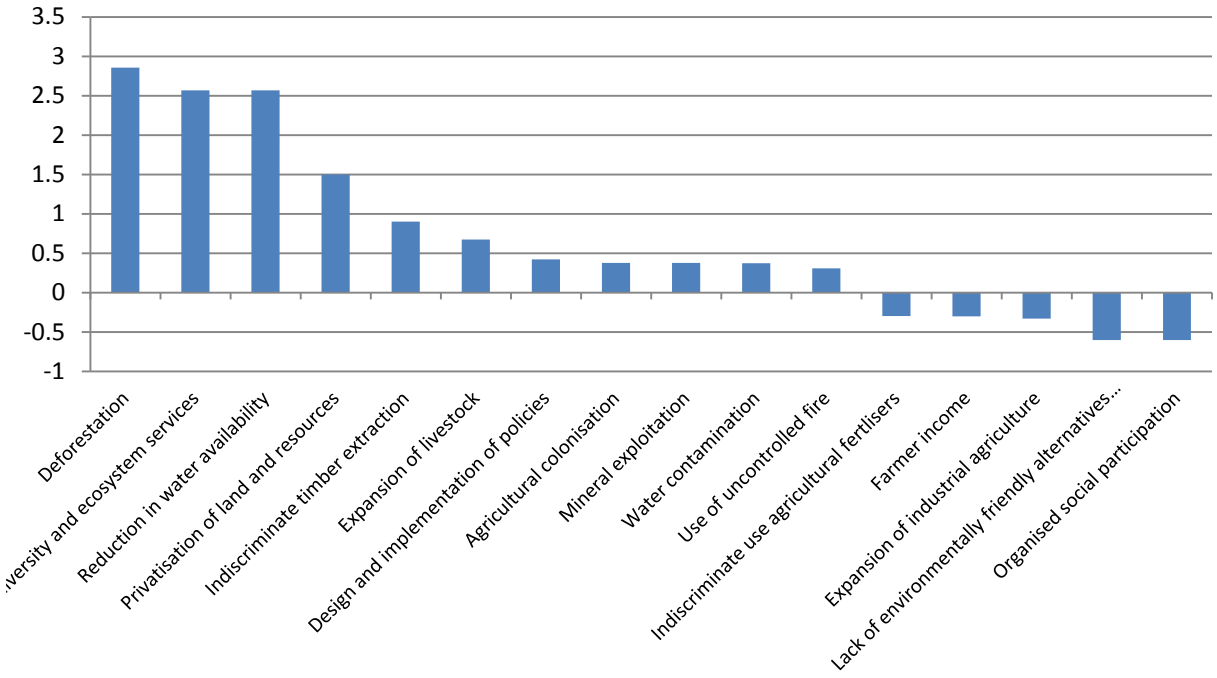


Figure 18. Total magnitude of impact on each variable within the FCM of Group 1.

Dynamic analysis of the FCM described in Figures 16 demonstrates a system in which the principal effects are:

- Deforestation (magnitude of effect: 2.85)
- Loss of biodiversity and ecosystem services (magnitude of effect: 2.56)
- Reduction in water availability (magnitude of effect: 2.56)

To a lesser extent, it is noteworthy that within this system that the magnitude of impact on social organisation (magnitude of effect:-0.6) and environmentally friendly alternatives (magnitude of effect: -0.6) are declining.

3.3 Brazil

3.3.1 *Objectives and organisation of the workshop*

The objective of this workshop was to gain an improved understanding of the local perceptions of the present state of the environment, as well as to better understand what factors are considered locally to be the causes of such changes.

The workshop held on the 27th of November 2013, was attended by 23 stakeholders from a range of different interest groups including; Ministry of Agriculture (MAPA), The Federal University of Western Pará (UFOPA), Chico Mendes Institute for Biodiversity Conservation (ICMBIO), Hope Foundation (IESPES), EMBRAPA Eastern Amazon, Tapajós Community Leaders, The Nature Conservancy (TNC) and Luiz de Quieroz College of Agriculture (ESALQ-USP).

The workshop was coordinated and facilitated by members of UPM and Empresa Brasileira de Pesquisa Agropecuária (The Brazilian Company for Agricultural Research, EMBRAPA). After an initial introduction about the ROBIN project, its aims and goals, the facilitators took the opportunity to discuss the expectations of the workshop and its benefits not only to ROBIN, but also to the participants themselves.

A first working session included a brainstorming exercise in which participants were offered the chance to discuss as to what they considered to be the problems associated with the current state of the local environment. Following the brainstorming exercise, the opportunity was taken to present the theory and methodology behind FCMs. The group was then divided in two, allowing for two FCMs to be produced and to ease the process of producing the conceptual models in the second working session. The group was split as evenly as possible, whilst retaining the diversity of representatives from the larger group.

The break-out working session started by posing the participants with the following question: ‘In your opinion what factors have influenced the current state of Amazonia in areas with forest and its surroundings?’ In answering this question, participants identified the factors responsible for the present state of the local environment and rated their relative relevance. During the afternoon session, participants identified the links between the factors previously selected and suggested the strength and direction of these relationships (i.e. positive/direct relationship or negative/inverse relationship). Finally, the two groups presented and discussed the FCMs developed in a plenary session.

3.3.2 *Identified issues concerning the state of the environment*

To begin the discussion concerning the current state of the environment, a brainstorming session was facilitated by the questions 'In your opinion what factors have influenced the current state of Amazonia in areas with forest and its surroundings?' Where the following factors were identified:

-Deforestation
-The role of farmers in deforestation
-Increase in deforestation over the past 10 years
-High proportion of farmers following the law in Santarem
-Environmental responsibility generated by economic viability
-Need to provide incentives to small farmers
-Incompatibility of Flona's Management Plan with local way of life
-The production and price of soya
-Fire is a tool in traditional management
-Small farmers are limited by management capacity
-Access to technology is limited to small farmers
-Access to technology can be environmentally friendly
-Organisations should pay more attention to women
-Women are the base of the working pyramid and are the main contributor to family income
-Economic sustainability is of great importance
-Solutions should be entirely inclusive
-Rational exploitation
-Land tenure
-INCRA- responsible institution for land management and colonisation
-Limits on the municipality to manage its land
-Conservation management problems due to a lack of governance
-Lack of governmental communication

After this brainstorming, the break-out session started with the identification, in each group, of those factors associated with the current state of the environment. Each participant was offered the opportunity to suggest three factors that they considered to contribute to the present situation. Following this, participants were asked to suggest which factors in their opinion had the greatest importance in determining the present state. The results of this activity can be seen in the two spider-grams below, representing the responses of the participants from both groups. The values displayed are standardised.

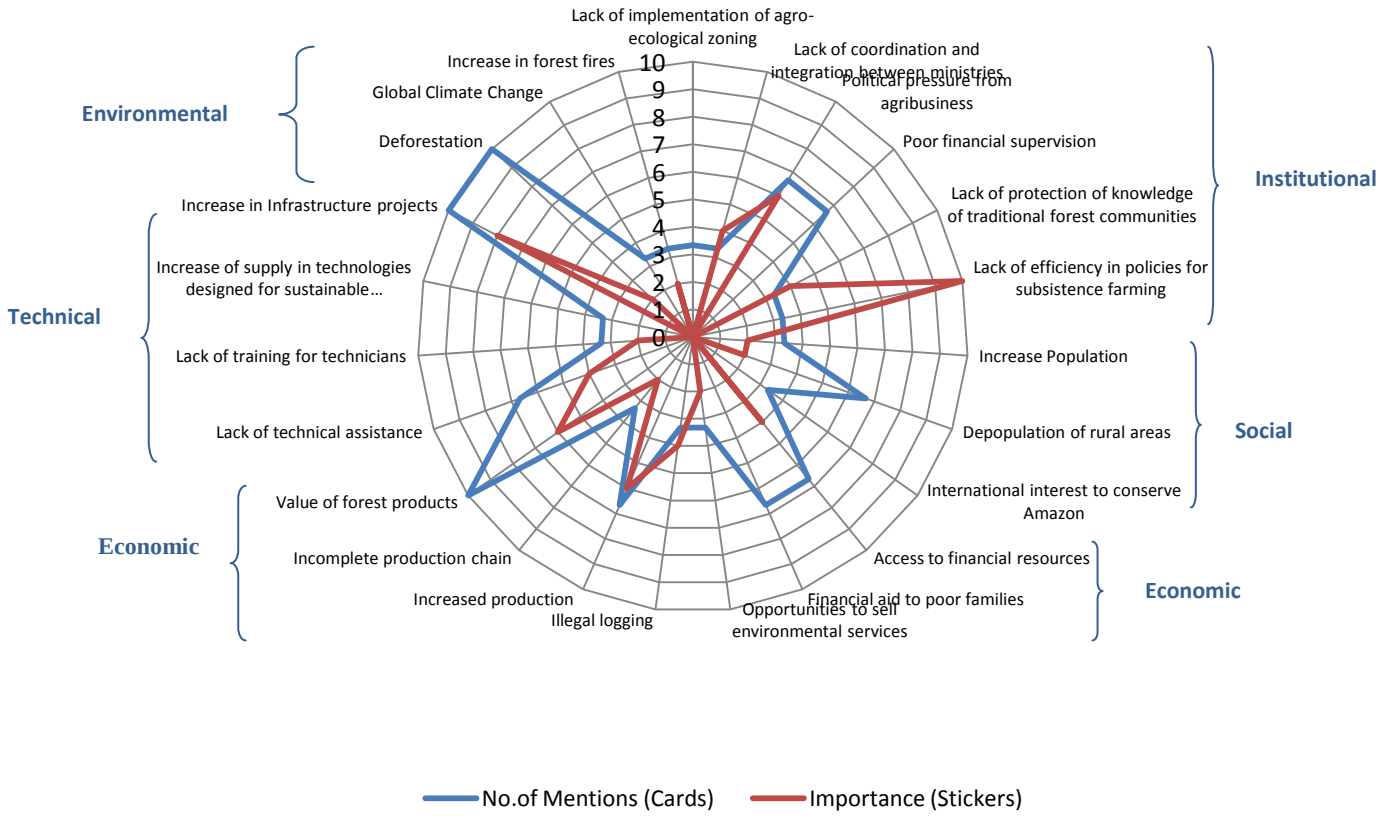


Figure 19. Spider-gram developed from Group 1's initial discussions concerning the state of the environment in Flona Tapajós.

The spider-gram of the elements identified by group 1 demonstrates that the most mentioned factors were deforestation, the value of forestry products and increase of infrastructure projects (number of projects). Also, the lack of technical assistance, the increase of production and financial issues such as financial support to poor families, the access to financial resources and a poor financial supervision, were highly mentioned. Among the most important factors, stakeholders stressed the relevance of the lack of efficiency of policies targeting subsistence farming, and the increase in infrastructure projects.

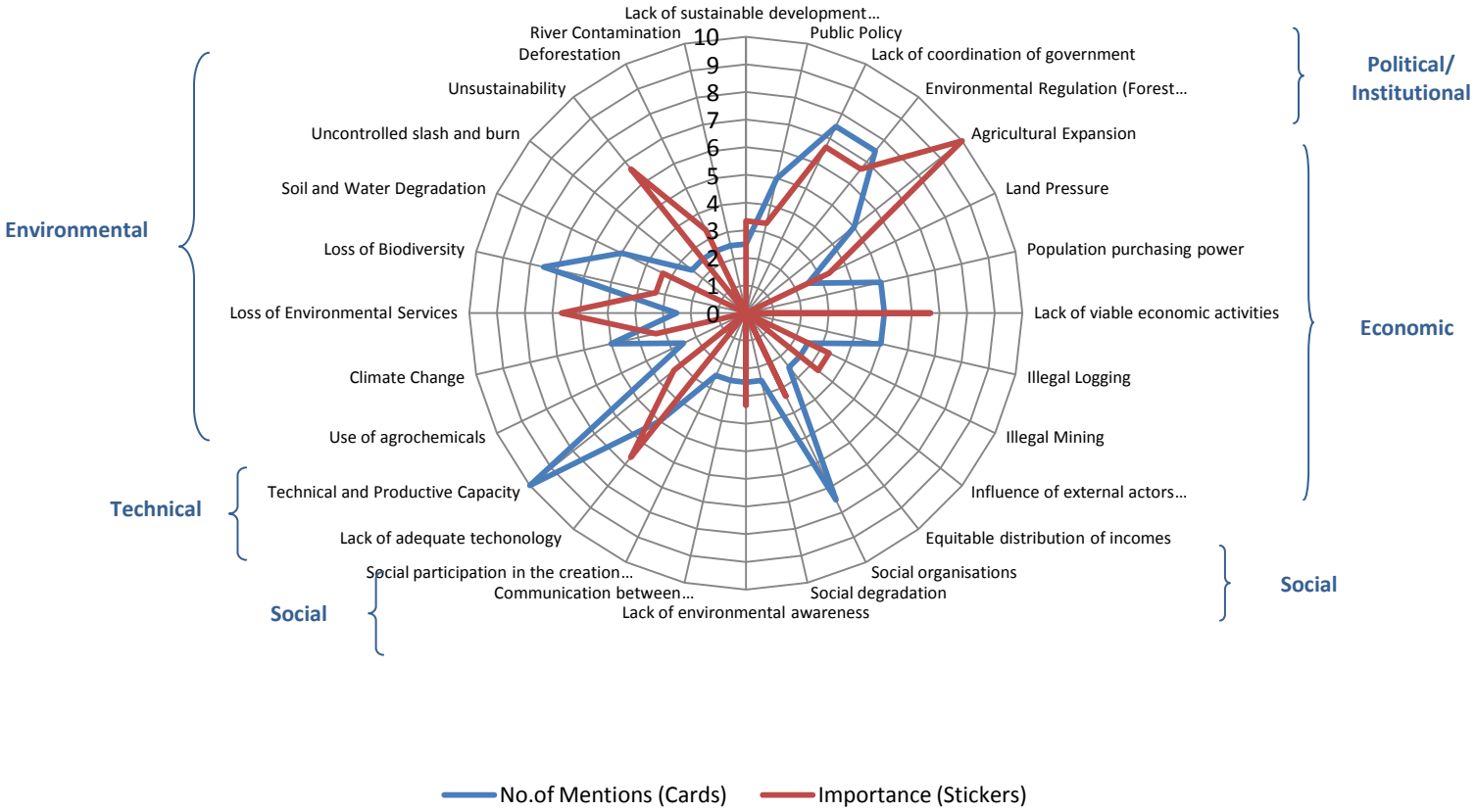


Figure 20. Spider-gram developed from Group 2's initial discussions concerning the state of the environment in Flona Tapajós

As shown in Figure 20, the issue most frequently mentioned by stakeholders in group 2 was the technical and productive capacity in the area of Tapajós. The lack of governmental coordination, the environmental regulation, social organisation and the loss of biodiversity were also frequently mentioned. However, the most frequently mentioned factors do not match those rated as most important by the stakeholders. The most relevant factors according to participants are agricultural expansion, unsustainability, the loss of environmental services, the lack of adequate technology, the lack of viable economic activities, and again, the lack of governmental coordination and environmental regulation.

The identified issues in Flona Tapajós principally corresponded to the areas of environment and economics and to a lesser extent the areas of social, political/institutional and technical. The most mentioned and important factors from the perspective of the stakeholders are highlighted in the following table.

Table 5. The most mentioned and most important factors mentioned in Groups 1 and 2 during the present workshop in Flona Tapajós.

	Group 1	Group 2
Factors Most Mentioned	- Deforestation - Increase in infrastructure projects - Value of forest products	- Technical and productive capacity - Lack of Co-ordination of government - Environmental regulation and financing - Loss of Biodiversity
Most Important Factors	- Lack of efficiency in policies for subsistence farming - Increase in infrastructure projects - Political pressure from agribusiness - Increased production - Value of forest products	- Agricultural expansion - Lack of co-ordination of government - Environmental regulation and financing - Lack of viable economic alternatives - Lack of adequate technology - Loss of environmental services - Unsustainability

3.3.3 *Conceptual models (FCMs) and dynamic analysis of the present*

Building upon the list of identified factors and taking into account their importance, each group built a FCM in which the different factors were linked to each other and the strength of those links was quantified in relative terms. Figures 21 and 22 show the FCMs built by the two groups. The FCMs represents un-calibrated linkages considered by the stakeholders. The factors highlighted in green represent the central factors of the systems and in yellow the drivers.

As shown in Figure 21, the FCM built by group 1 includes 23 factors, 6 of them being the drivers of the system represented. These drivers are global climate change, increase in supply of technologies for sustainable production, population increase in the Amazon, lack of institutional coordination and integration (between different ministries), ineffective supervision, and the lack of protection of the knowledge of traditional forest communities. Moreover, the map has 3 central issues, namely deforestation, increase in forest fires and increase in infrastructure projects. The system represented is a complex one with several loop and redundancies (one relationship represented by more than one path).

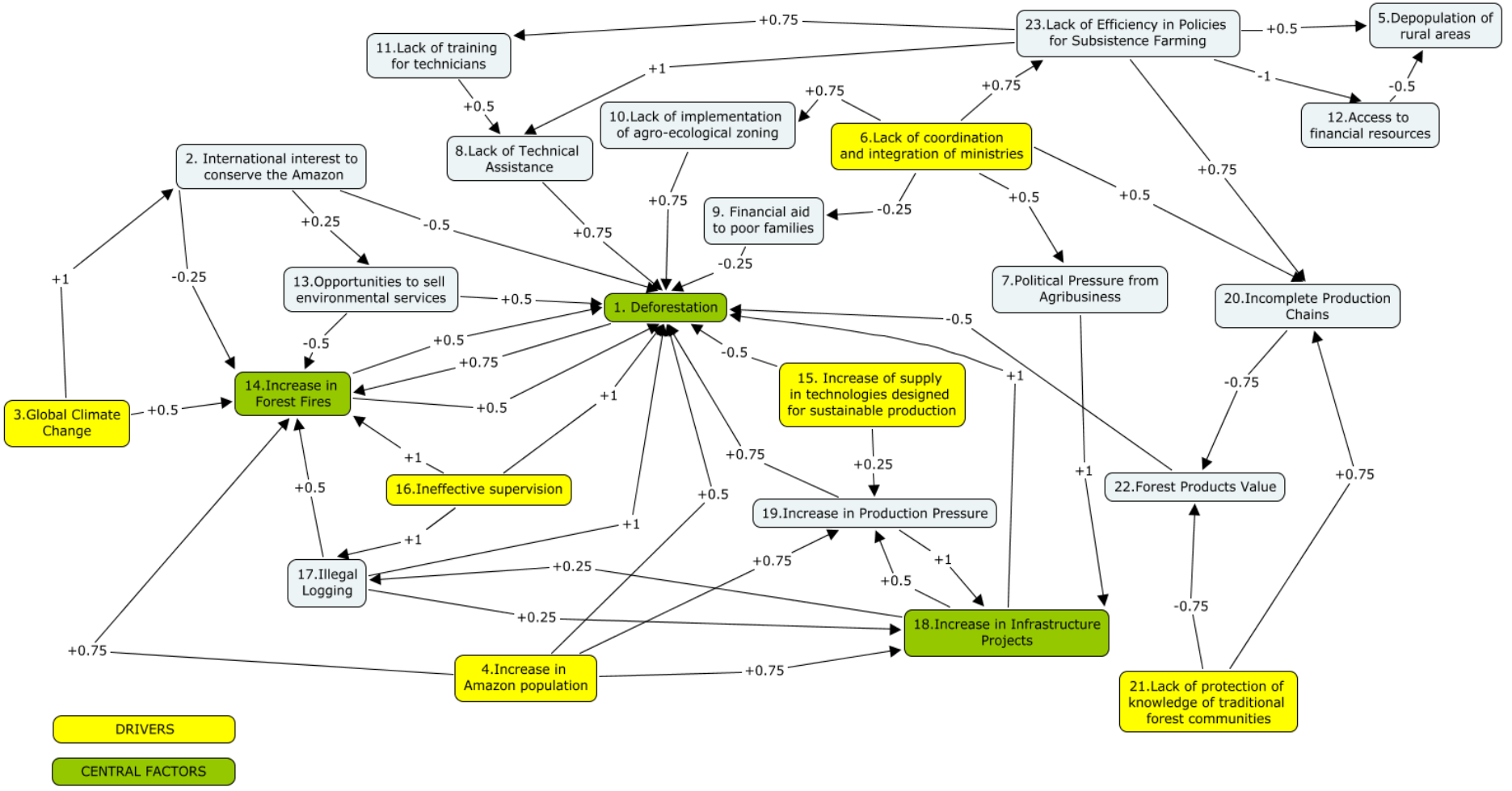


Figure 21. Fuzzy Cognitive Map made by Group 1 in Flona Tapajós.

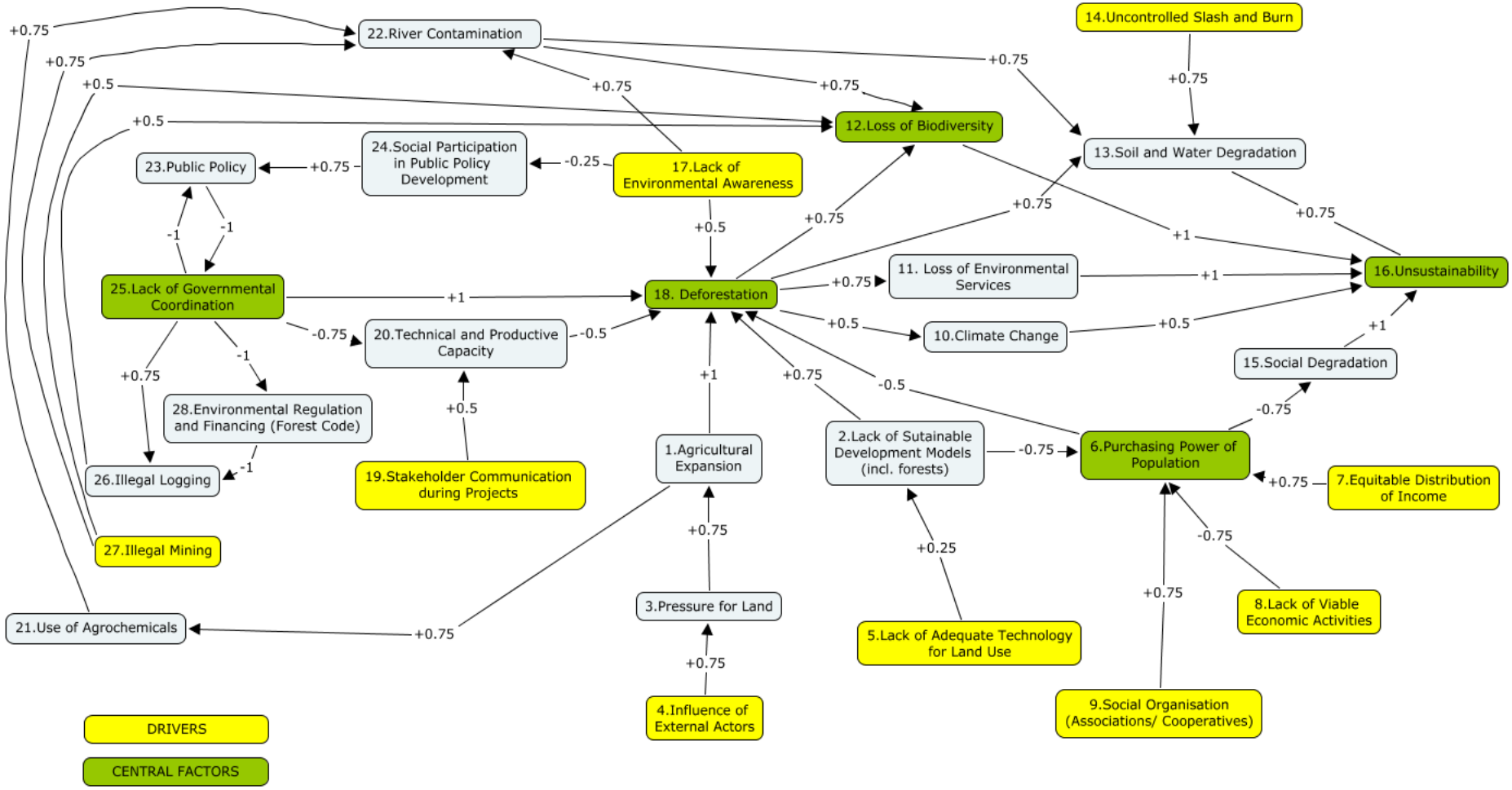


Figure 22. Fuzzy Cognitive Map made by Group 2 in Flona Tapajós.

The FCM built by group 2 (Figure 22) includes 28 factors, and it is also a complex system that includes loops, bidirectional links and some redundancies. Of the 28 factors, 9 of them are drivers of the system and 5 are considered central factors. The drivers considered include illegal mining, stakeholder communication during projects, influence of external factors, lack of environmental awareness, lack of adequate technology for land use, social organisations, lack of viable economic activities, the equitable distribution of income, and uncontrolled slash and burn. The central issues identified are the lack of governmental coordination, deforestation, biodiversity loss, the purchasing power of population and unsustainability. Among the main consequences of the system's functioning we find deforestation and as a consequence of it climate change, the loss of ecosystem services and biodiversity loss. The lack of potential economic activities is highlighted in the map, and only agriculture, illegal mining and illegal logging are mentioned as sources of income.

The systematic combination of the two groups FCM's followed the same process as described in the section 3.1.3 In combining the FCM for Flona Tapajós, a number of general calibrations have been made.

Within this FCM there were a number of relationships considered to be redundant, by which is meant that relationships between factors were demonstrated in more than way. Therefore, in a number of cases such redundant relationships were removed from the FCM. There were also cases where the clarity of the relationship between factors was unclear and therefore removed. Finally, relationships that were weighted highly (+1/-1) were respectively reduced to either +0.9 or -0.9.

Figure 23 shows the combined FCM for Flona Tapajós and Figure 24 the dynamic analysis of the system represented. Figure 25 demonstrates the total change produced to the different factors under the effect of the drivers of the system.

The combined FCM for the Flona Tapajós case study includes 32 factors, being 9 of them drivers of the system, such as illegal mining, lack of environmental awareness, lack of governmental coordination, international interest to conserve the Amazon, lack of efficiency of policies for subsistence agriculture, lack of protection of traditional forest communities, population increase in the Amazon, opportunities to sell environmental services and technology supply for sustainable land use. Deforestation is the central issue in this map. Among the factors that contribute to slow down deforestation stakeholders mentioned are; international interest to preserve the Amazon, opportunities to market environmental services, the purchasing power of population, technical and productive capacity and environmental monitoring. Some of these beneficial factors are, however, hampered by the lack of governmental coordination. Among the factors that are contributing to accelerate deforestation we find a lack of environmental awareness, the lack of public policy, a lack of technical training and assistance, large infrastructure projects, agricultural expansion, and the lack of sustainable development projects.

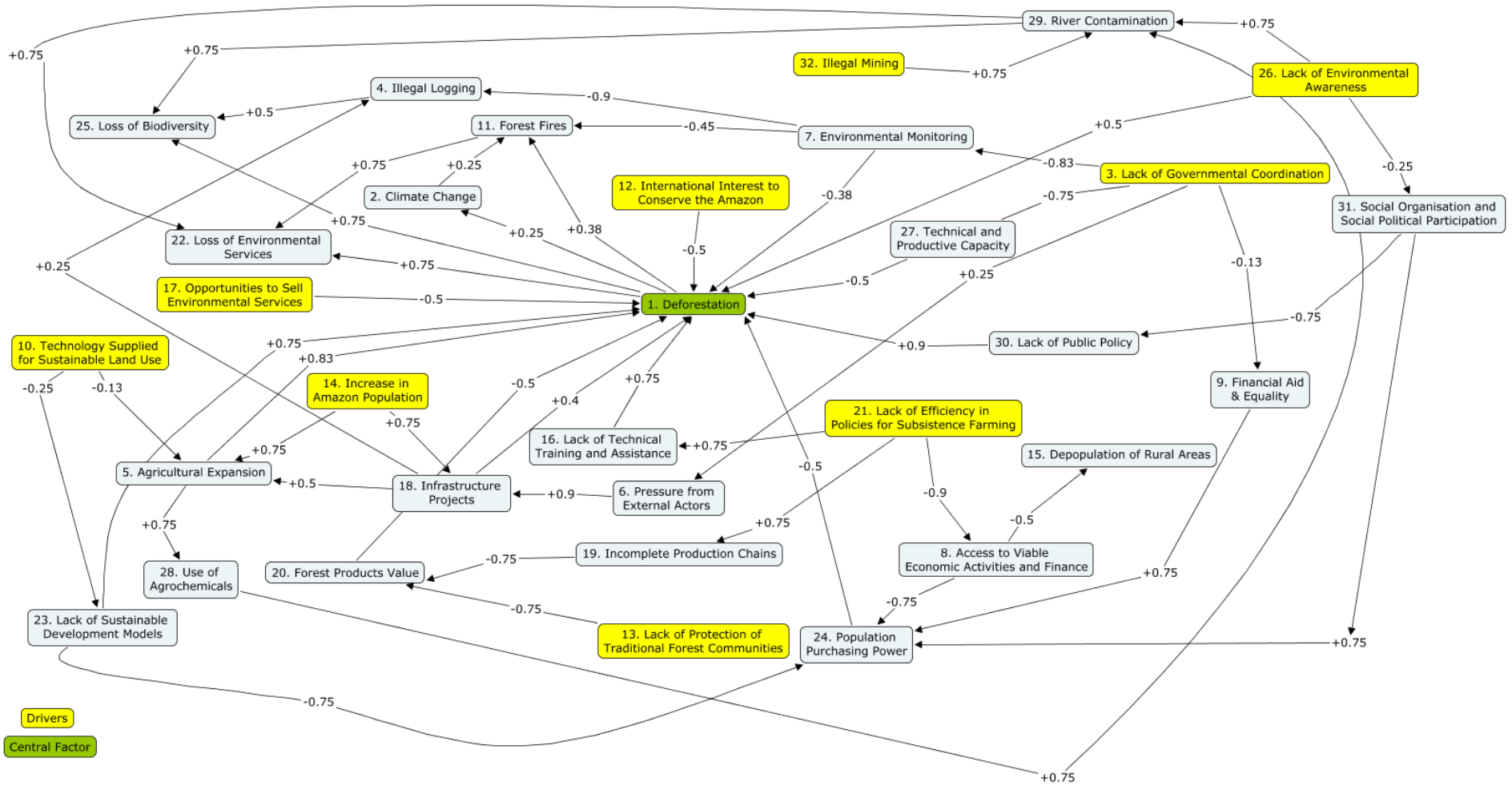


Figure 23. Combined FCM for Flona Tapajós.

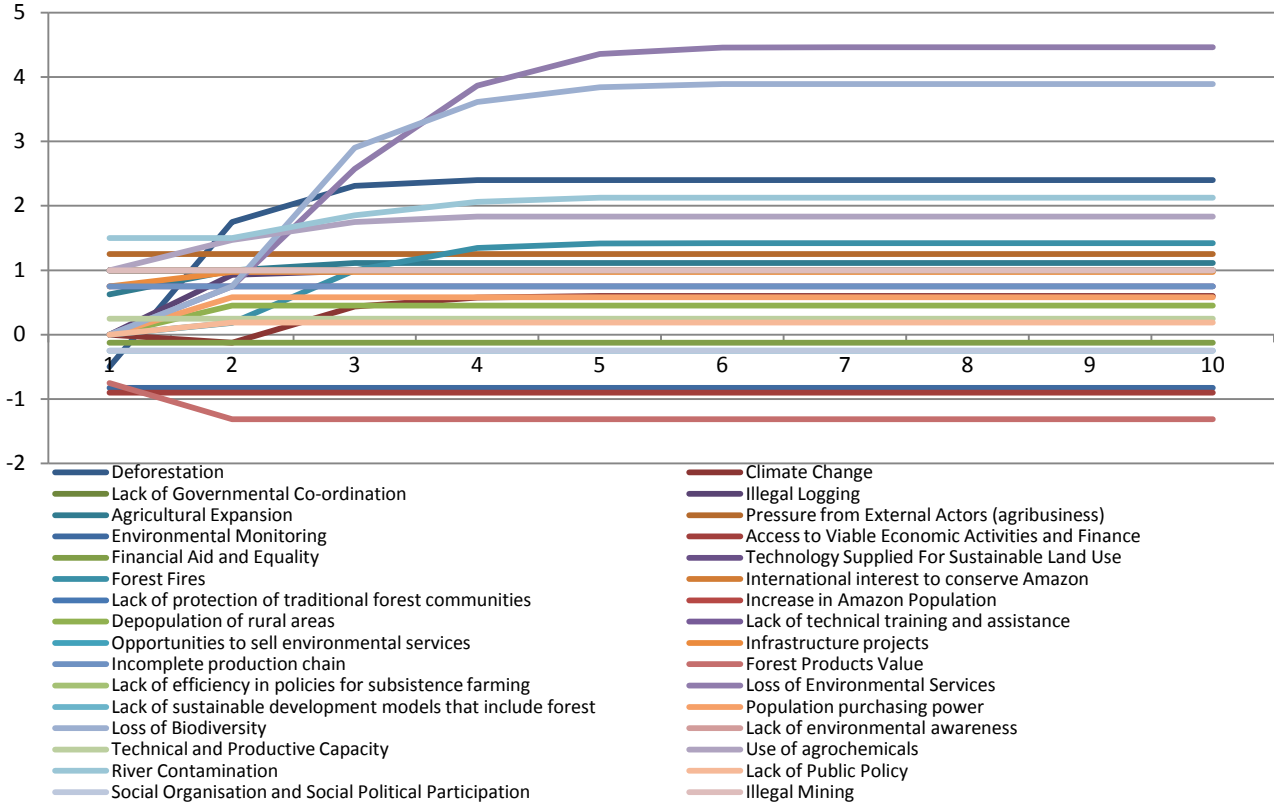


Figure 24. Dynamic analysis of the combined FCM of Flona Tapajós

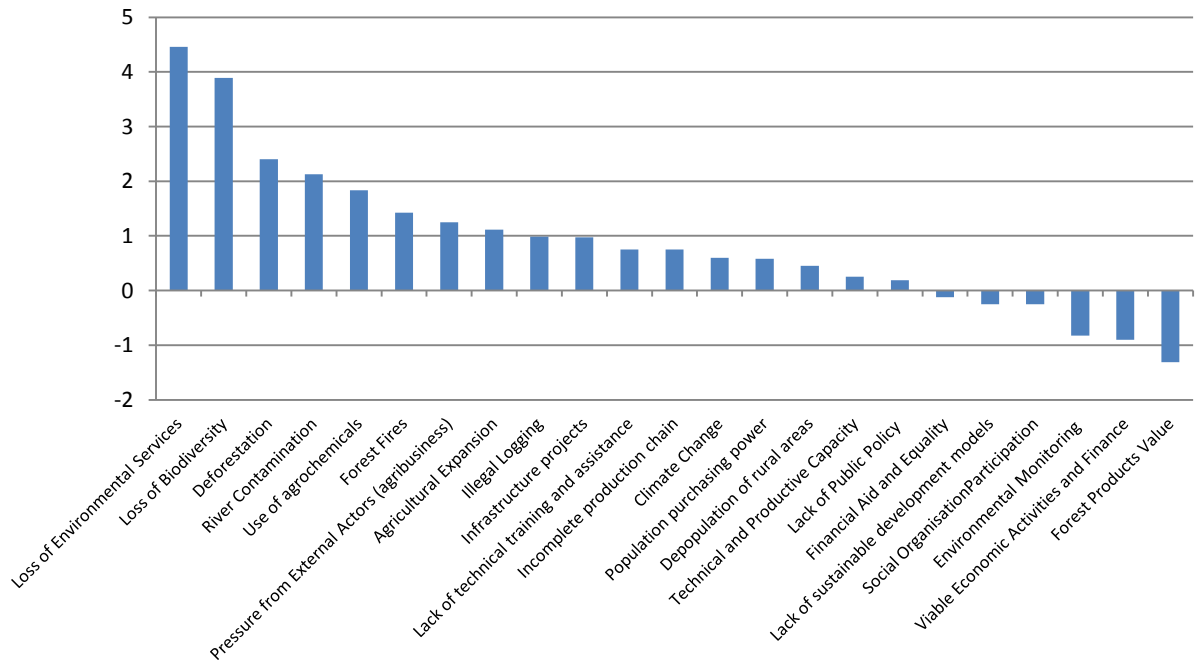


Figure 25. Total magnitude of impact on each variable within the combined FCM of Flona Tapajós

The dynamic analysis of the system in Flona Tapajós is shown above in Figures 24 & 25; one can see that the analysis shows a system in which the principal effects are:

- loss of environmental services (magnitude of effect: 4.5)
- loss of biodiversity (magnitude of effect: 3.8)
- deforestation (magnitude of effect: 2.4)

It is noteworthy that the results suggest that the value of forest products (-1.3) and viable economic activities and finance (-0.9) are both negative.

3.4 Comparative Analysis of Present FCMs

The following section develops upon the findings from the workshops in the three case studies; analysis has been made of the stakeholder perceptions of what they consider to be changing within the local environment, as demonstrated by the FCMs. Table 6 offers a concise summary of the central factors and drivers identified by the stakeholders across the three case study sites.

Table 6. Summary of the 'present' FCMs from the three case study sites.

Key Issues		Bolivia	Brazil	Mexico
Central Factors		- Deforestation	- Deforestation	- Deforestation - Expansion in Industrial Agriculture
Drivers	Social	- Lack of Environmental Awareness	- Lack of Environmental Awareness - Population Increase - International Interest to Conserve the Amazon	- Lack of Education and Information
	Economic	- Land Trafficking - Illegal Mining	- Illegal Mining - Opportunities to sell Environmental Services	- Farmer Revenue - Market Demands - Tourism
	Political	- Lack of Co-ordination & Application of Policies - Poor Administration by Community Leaders - Application of INRA (National Institute for Agrarian Reform)	- Lack of Governmental Co-ordination - Lack of efficiency in policies - Lack of protection of traditional communities	- Design and Implementation of Policies
	Environmental	- Climate Change	- Climate Change	- Climatic Extremes

Through analysis of the results from the first stakeholder workshops one can gain an insight into the perceptions of the state of the environment within each of the three case study sites. The factors considered to be causing appreciative impacts upon the local environments are subtly different from one case study to another. However, a number of generalisations and patterns can be identified.

In Bolivia, stakeholders appear to perceive -based upon the importance placed on these factors during the workshops- the greatest changes to the environment as being deforestation, forest fires, slash and burn and contamination (Figures 1 & 2). These factors are subtly different from those described by the Brazilian stakeholders who appear to view more importantly what can be perceived as being the underlying drivers of change, including the lack of efficiency in policies, lack of governmental co-ordination and lack of viable economic alternatives amongst others (Figures 19 & 20). In Mexico, stakeholders followed a similar tack to both Bolivia and Brazil mentioning deforestation and biodiversity loss, but also inadequate policies and management. Interestingly, the Mexican stakeholders also expressed the perception of the importance of market demands in being one of the major causes of change (Figure 14).

Despite these subtle national differences, the fuzzy cognitive maps once compared begin to show similar patterns across the three sites. Firstly and most obviously, each FCM describes deforestation as the central factor to changes within the local environment (Figures 5, 16 and 23). This is perhaps to be expected, as the loss of forests is likely to be the most appreciable change to an environment witnessed on a daily basis. Therefore, when the FCMs were being constructed it is understandable that this would become the focal point, and that a lot of other factors would be considered with respect to it. The perception that deforestation is a central factor to environmental change is supported by a wealth of literature, which has highlighted the vast array of drivers and causes of deforestation in each of the study site countries (Pachecho, 2006; Bottazzi & Dao, 2013; Fearnside, 2001; Richards et al., 2012; Bray et al., 2004; Schmook & Vance, 2008). The literature invariably also supports a number of the linkages that are highlighted within the FCMs, as an example agricultural expansion is considered in all three of the FCMs as being one of the strongest causes of deforestation in each site and this importance is supported by the literature (Bolivia: Müller et al., 2012; Paneque-Gálvez et al., 2013. Brazil: Macedo et al., 2012; Verburg et al., 2014. Mexico: Flamenco-Sandoval, 2007; Bonilla-Moheno et al., 2012). Further, encroachments into the forest and development of infrastructure are further supported by the literature as being considerable drivers of deforestation (Perez-Verdin et al., 2009; Bottazzi & Dao, 2013).

Dynamic analysis of the systems (Figures 6, 17 and 24) further highlights the relative importance of deforestation within each system, with it having the largest relative effect in Mexico, the second in Brazil and the third in Bolivia. Further analysis of the three systems highlights another pattern, the perceived impacts upon biodiversity loss. Biodiversity loss is considered to receive the greatest impact within the system of Bolivia (Figure 7), and the second greatest in Mexico (Figure 18) and Brazil (Figure 25). These results suggest that-if these FCMs are representative of the current states of the environment in at least Guarayos, Chamela-Cuitzmala and Flona Tapajós- biodiversity loss and deforestation are likely to continue.

It is interesting to note not only the similarities, but also the differences within each of the three FCMs; perhaps the most prominent differences are the factors shown to be reducing in terms of the magnitude of impact in the system. In Bolivia (Figure 7), the system defined by stakeholders show neither economic nor technical, but political factors as reducing.

Application of, and adherence to policies from the perspective of the system are reducing in terms of the impacts within the current system. In Mexico (Figure 8), the factors considered are related to social and economic factors. Both organised social participation and lack of environmentally friendly alternatives are seen to be declining. In Brazil (Figure 25), the system defined by stakeholders shows economic factors such as the value of forests products and access to viable economic activities to be reducing.

3.5 Stakeholder's Evaluation of the 'Present' Workshops

A questionnaire accompanied the workshops to get a better understanding of what participants perceived to be the utility of the workshops, as well as the difficulty of the methodology in producing the FCMs. Questions related to the current environmental situation, the understanding of the situation, about the methodology and whether participants thought that the final FCM represented the current situation in the area.

After each meeting a 'mood-o-meter' analysis was performed to gain an understanding of how satisfying and successful each workshop was, from the perspective of the participants. Coupled with this analysis a post-workshop evaluation was made by organisers/ facilitators and the observers of each workshop. What is presented in the following evaluation is a selection of the results. Further analysis of the questionnaire provided to the stakeholders, as well as an evaluation of the workshops can be found in the Annex section of this document. For further analysis of the questionnaire, please see Annex 7.1.3 for Bolivia, 7.2.3 for Mexico and 7.3.3 for Brazil and for the facilitator evaluation please see 7.1.2 for Bolivia, 7.2.2 for Mexico and 7.3.2 for Brazil.

Across the three sites the workshops received high approval ratings (Figure 26), with over 85% of stakeholders in each country stating the workshops had been useful. Stakeholders in Mexico were found to be the least optimistic about the workshop's utility, with only 85% agreeing, whilst 95% of Brazilian and 92% of Bolivian stakeholders stating their agreement for the utility.

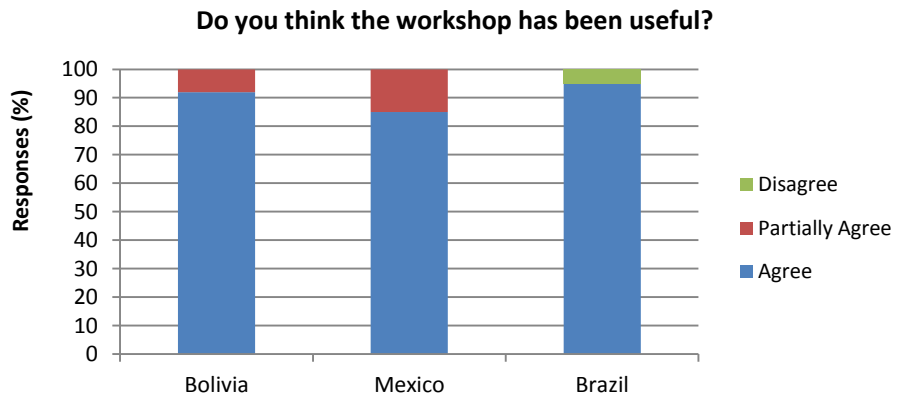


Figure 26. The 'mood-o-meter' responses from the 'present' workshops.

In terms of the methodology of using the FCMs (Figure 27), it was consistently highlighted by the stakeholders that the most difficult part of formulating the FCMs was assigning a weight to the relationships between the factors (Bolivia 34%, Brazil 45% and Mexico 31%). In both Brazil and Mexico the second most cited problem was that associated with demonstrating the relationships between the factors (21% and 28%), as in which factors interact with other factors. In Bolivia the selection of factors (31%) was cited as being the second most difficult step of the process. This information is useful in developing the future workshop in Mexico and improving the ease with which stakeholders can begin developing their own FCMs.

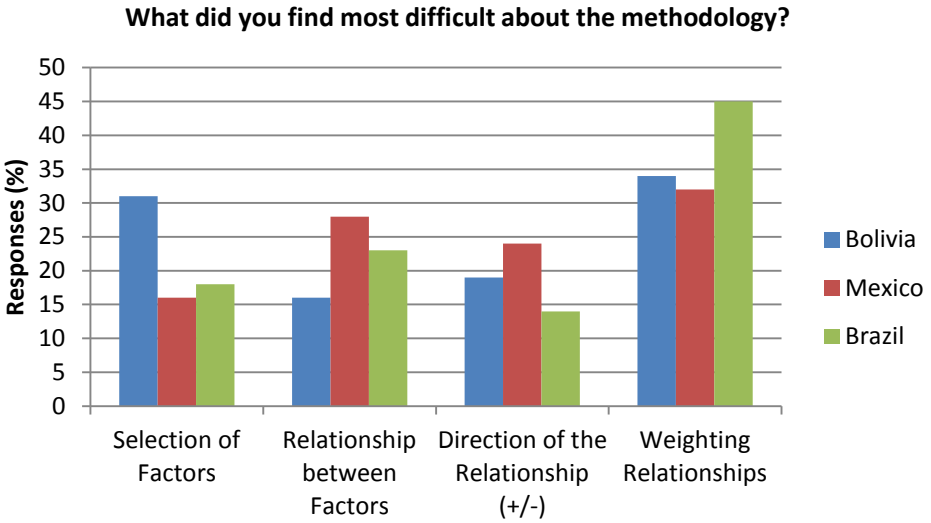


Figure 27. Stakeholder's responses to issues of the methodology.

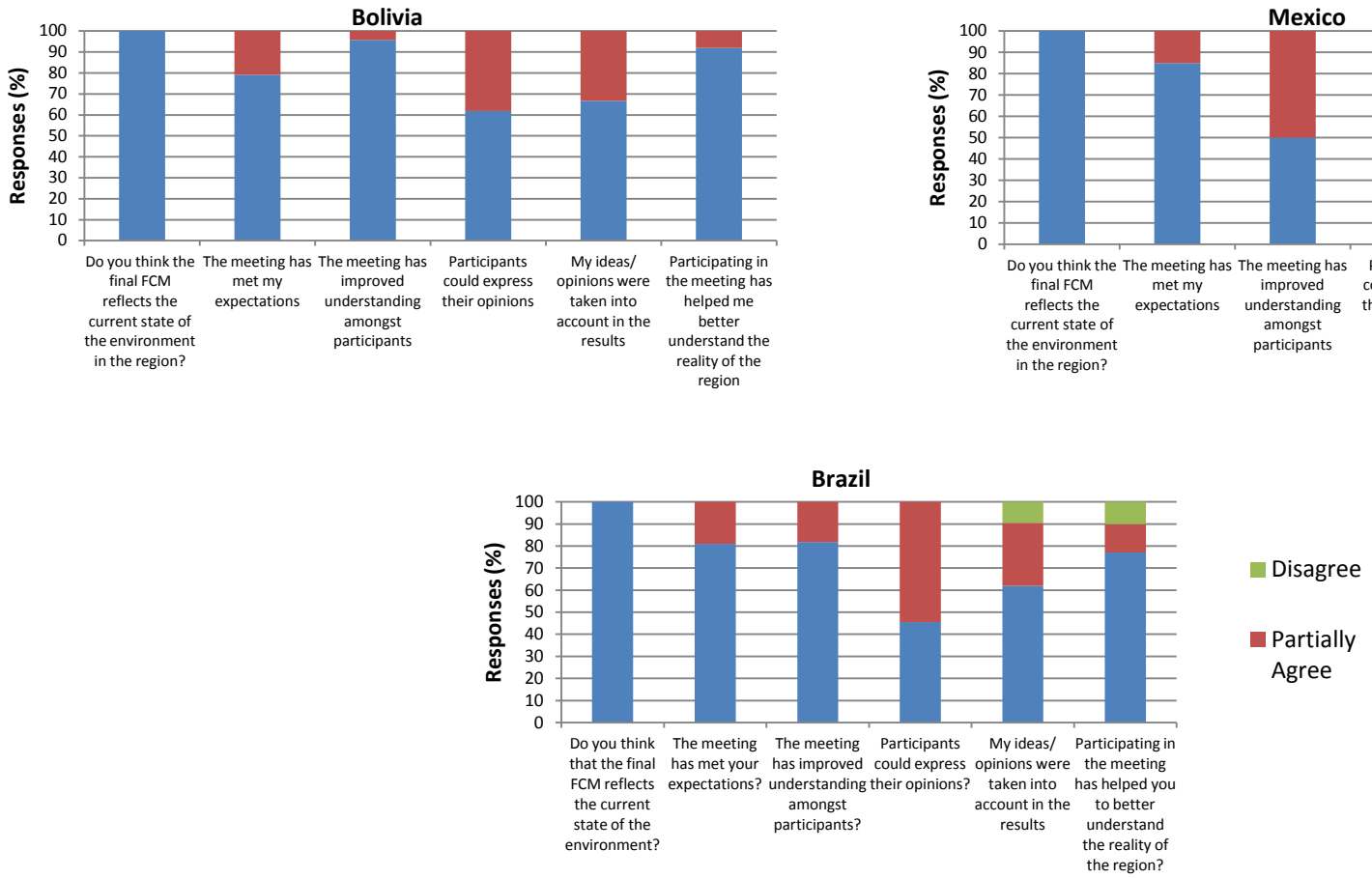


Figure 28. Stakeholder responses to questions referring to their experience of the workshops.

Figure 28 gives a detailed overview of participants' perspectives of the inclusivity of the workshops. In each of the workshops, across the three case studies, 100% of stakeholders expressed that they believed the fuzzy cognitive map produced fully reflected the current state of the environment. Over 60% of stakeholders in both Bolivia and Mexico demonstrated that they agreed that other participants in the workshops were able to express their opinions. However, in Brazil less than 50% of stakeholders agreed with such a suggestion, the majority suggesting that this was only partially true. Stakeholders in all three countries believed that their own ideas and opinions were taken into consideration whilst developing the conceptual model, with over 60% of respondents stating that this was true. In Brazil however, over 10% of stakeholders did not believe this to be true, highlighting a level of discontent in the perception of how opinions were considered in this workshop.

In conclusion, it would appear that in general the workshops were well received by the stakeholders and that in all three countries they were perceived to be useful. A useful insight from this evaluation is that in the future it may be of considerable help to stakeholders that particular attention is paid to describing how the relationships between factors are weighted, as this is consistently considered to be the most difficult step within the methodology. However, that around 35% of the participants in each case study workshop considered that their opinions were not fully taken into account or that it was not easy for other participants to express themselves should be fully considered in the future. This demonstrates the role that experienced facilitators have in guiding discussions and trying to motivate active participation of all attendants. Further, the success of the methodology is demonstrated by the unanimous sentiment that the maps produced fully reflected the current state of the environment in Bolivia, Brazil and Mexico.

4. Second Stakeholder workshop: Building long-term future scenarios

The analysis presented in the previous sections highlighted the current trends in forest degradation, deforestation and biodiversity loss in the three case studies analysed. The analysis of the main drivers and causes of deforestation lays the foundation for the identification of potential actions to revert these trends. For this, a second round of SH workshops was organised to look at how these causes and underlying drivers could evolve in the future, and how these may affect the socio-economic and ecological systems, based on global future scenarios of socio-economic, policy and climate change. This scenario development at local level is based on the scenarios used in the ROBIN project that combine the new IPCC scenario framework and different policy options. This section explains the scenario framework and the process and results of the second round of SH workshops.

The scenarios developed in the IPCC 5th Assessment Report (AR5) have moved away from the SRES scenarios used previously. The new scenarios developed contextualise the future socio-economically and climatically using two types pathways: shared Socio-economic Pathways (SSPs), which define the future socio-economic context, and Representative Concentration Pathways (RCPs), which define the levels of climate forcing have been developed. The context in which these future socio-economic pathways are positioned can be defined by the challenges faced by society relating to climate change mitigation and adaptation. The definition of these pathways are therefore characterised by how they are found within the area of the two axis of Figure 29, the *x* axis being climate change adaptation, and the *y* climate change mitigation (Jones & Kok, 2013).

Development of narratives that define these pathways are bound therefore by the location of each pathway relative to the aforementioned axis (Figure 29) and therefore by the ability of society to adapt to the effects of climate change on the *x* axis, and the challenges presented in mitigating climate change on the *y*. The narratives designed for these pathways and developed by O'Neil et al. (2012) are represented in Figure 29. These pathways are used for the specification of the ROBIN scenarios.

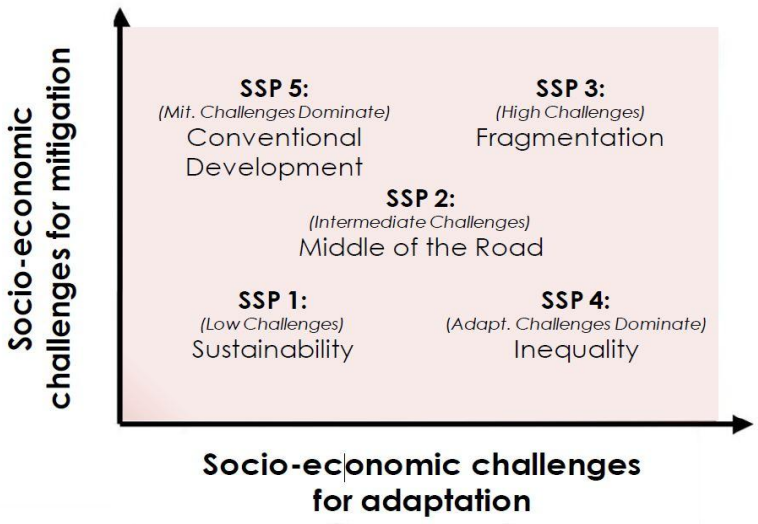


Figure 29. Shared Socioeconomic Pathways (SSPs) developed by O'Neill et al. (2012) separated along two main axes.

4.1 Future scenarios and policy options used in ROBIN

As part of ROBIN focus is dedicated to options for climate change mitigation with particular attention paid to biodiversity. As such ROBIN has defined a sequential set of policies that progressively focus upon land management. These policy options- developed in Jones and Kok (2013)-are demonstrated in Table 7 relative to both; socio-economic pathways and representative concentration pathways. These policy options are:

- C1 preventing deforestation
- C2 preventing both deforestation and degradation
- C3 preventing deforestation and degradation whilst performing re-forestation
- C3+BD focusing of carbon and safeguarding biodiversity
- C3+BD+ES focusing on carbon, whilst safeguarding biodiversity and ecosystem services.

Table 7. Shared Socioeconomic Pathways (SSPs), Representative Concentration Pathways (RCPs) and ROBIN Policy Options

RCP \ SSP	SSP1 Sustainability (Heaven)	SSP4 Inequality (Indifferent Dictators)	SSP5 Development First (Bread and Circuses; Meat not Green)
RCP2.6	C0 C1 C2 C3 C3+BD C3+BD+ES	C0 C1 C2 C3	C0 C1 C2 C3 C3+BD C3+BD+ES
RCP8.5	C0 C1 C2 C3 C3+BD C3+BD+ES	C0 C1 C2 C3	C0 C1 C2 C3 C3+BD C3+BD+ES

Source: Jones and Kok (2013). ROBIN Deliverable D2.3.1

In particular, two IPCC-guided socio-economic scenarios, SSP1 and SSP4, were identified that were highly relevant to the goals of the ROBIN project, the Meso and South American context for ROBIN, and the scenario development process that was being envisioned. Based on O'Neill et al. (2012) and the description in D2.3.1, they can be described as follows:

SSP1- Sustainability (Heaven)

The scenario demonstrates a future in which there is solid progress towards sustainability, with continued efforts made to achieve development goals, reduce resource use and increasingly reducing fossil fuel dependency. Elements that contribute to movement towards

this future scenario are that development is made in low-income countries, inequality is reduced, technology is developed rapidly, and high levels of environmental awareness are seen globally.

Governments implement stringent environmental policies, in cooperation with public parties. This leads for instance to good public transport, environmental friendly buildings, and clean energy, whilst sustainable agriculture, fair trade and eco-tourism increasingly become normalised. Society in this scenario thinks and acts differently from today, supporting more sustainable options and resulting in a shift from the present situation.

SSP4- Inequality (Hell)

Represents a highly unequal world, where the small, rich global elite is responsible for the greatest percentage of global emissions, whilst a larger, poorer group contributes little and is highly vulnerable to the impacts of climatic fluctuations. Governance and globalisation are effective for and controlled by the elite, but are ineffective for most of the population.

The inequality between rich and poor increases both inter and intra nationally, resulting in increases in terrorism as inequality increases. Security becomes increasingly important in governmental policy, such extreme inequality leads to increased proliferation of gated communities, where the rich live comfortable and privileged lives, whilst the poor struggle to make ends meet outside. Market forces continue to be important, but states increasingly move to secure access to strategic resources.

These two socio-economic scenarios (SSP1 and SSP4) allow a focus on the extremes, but also allow comparing different policy actions under the same socio-economic context and climate forcing scenario. Thus, SSP1 and SSP4 were finally chosen to be used in the case-study workshops in ROBIN, where they were presented along two main axes, environmental protection and social cohesion, to make them more visual and understandable for stakeholders (Figure 30). These axes are similar to those used in other EU projects (SCENES, MEDPRO, AMAZALERT) addressing scenario development processes. The ‘heaven’ scenario (upper right quadrant of Figure 30) was associated with SSP1 plus a set of strong policy actions (C3+BD+ES) designed to protect the environment and provide multiple ecosystem services. It encapsulates the most positive possible developments, with low challenges for mitigation and adaptation. On the other side, the ‘hell’ scenario situated (lower left quadrant) was visualised as SSP4, in absence of strong policies to manage carbon stocks or additional safeguards. It can be considered the worst-case scenario most likely to result in land-use changes that will exceed thresholds or tipping points and in big socio-economic challenges for adaptation.

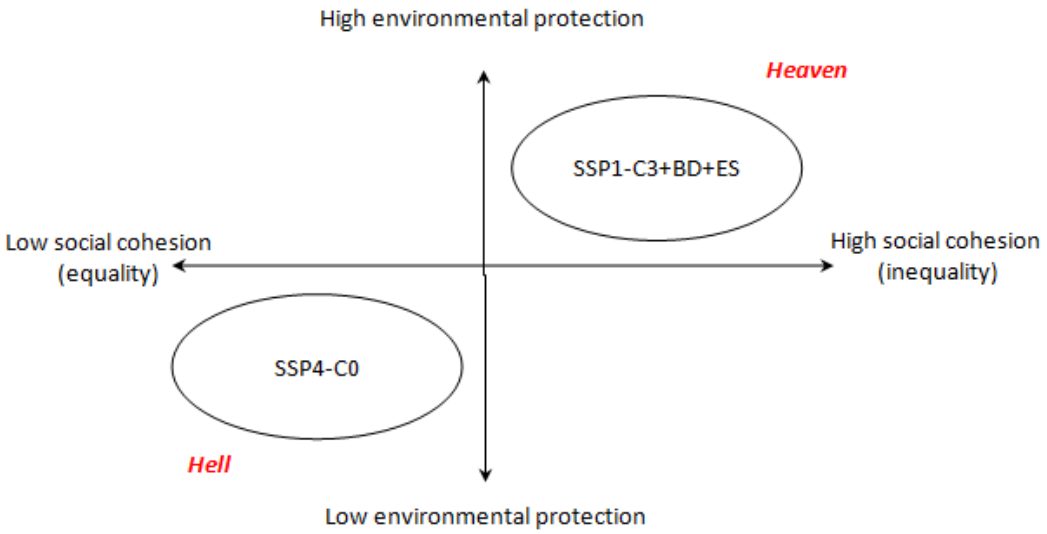


Figure 30. Scenarios selected to be used in the case-study workshops in ROBIN.

In all cases, it has been assumed one, rather extreme, scenario for climate change with a focus on 2050 as a time horizon. Within the discussion on social, economic, and political changes, climate has normally a very small role. To increase this slightly, one strong climate change scenario, RCP 8.5, was selected to include climate change effects into the discussion. RCP 8.5 is the most interesting climate forcing scenario in the context of the workshops in ROBIN because it has a markedly higher CO_2 concentration in the atmosphere by 2050 (about 650ppm). The rest of climate forcing scenarios (RCP 2.6, 4.5, 6.0) do not separate out in 2050. Thus, only assuming a strong climate change scenario like RCP 8.5, it is possible to take into account the role of climate change (or climate variability).

These 'heaven' and 'hell' scenarios are considered to be the initial scenarios to define the Meso and South American context within which stakeholders will develop their own scenarios. Therefore, they can be applied differently within each country.

In the case of Brazil, these scenarios were compared to the 'visions' being developed in the AMAZALERT project by an expert panel, composed of mainly invited researchers from INPE's Earth Science System Centre (CCST) (see Deliverable 1.3 in AMAZALERT). It was noticed that SPP1 shows a strong similarity with the Brazilian CCST 'Vision A', while SSP4 is very much linked to the CCST 'Vision B'. The storylines of Vision A and Vision B are:

<u>Vision A</u>

It combines high social, environmental and economic development. It represents a "desired" (normative) future, from the perspective of the expert panel involved in the process. In this scenario, it is envisioned that government and society will reverse the structural situation of social inequities in Brazil, whilst taking fully into account environmental and economic dimensions. In this vision, the land use system reflects this positive situation. Rural areas would be a mosaic of well managed sustainable territories, providing ecosystem services and food security for the country population. There would be a balanced relation between rural

and mid-sized urban centres, in terms of agricultural production, services and industrial jobs. This scenario could be called a 'Sustainable green'.

Vision B

It brings a commodity oriented economy with sufficient respect to environmental laws, due to the international environmental awareness, reflected in consumer pressure. Social indicators would grow as a result of macro-economic success, following the current trends, but governments in the future prioritise GDP growth over reversing structural social problems and inequities. Vision B can be considered as "business-as-usual" for Brazil. Although deforestation-driven greenhouse emissions, for instance, would not be a major concern in this scenario, society remains with unequal access to natural resources, land, markets, credit, services and job opportunities. Food becomes more and more expensive, due to the badly planned rural-urban relations in terms of food security and a lack of attention to smallholder agriculture. Most of the land would be controlled by large companies. However, those companies do follow the environmental legislation ruled by international certification processes in the context of well established green markets. This scenario could be called an 'Unequal green'.

As shown, Vision A and Vision B are linked to SSP1 and SSP4, but they are not complete opposites. In the case of Brazil, there is a degree of 'greenness' assumed in all plausible futures.

4.2 Bolivia

4.2.1 *Objectives and organisation of the workshop*

The objective of this workshop was two-fold; firstly the workshop was developed so that stakeholders could validate the combined and enriched FCM developed using data gathered from field-work performed in the area. Secondly, it was used to gain an understanding of stakeholders' perceptions of two scenarios relating to the future of their local environment, with them asked to consider the factors that would be prevalent within each scenario.

The workshop held on the 18th of June 2014, was attended by 27 stakeholders from a range of different interest groups including; Autonomous Government of Santa Cruz (GDASC), Department of Protected Areas (DIAP), Department of Agriculture (SEDACRUZ), Indigenous Guarayos Women' Centre (CEMIG) Las Misiones Radio, Radio Guaguazuti, Central Organisation of Native Guarayo Villages (COPNAG), Department of Natural Resources (DIRENA), Indigenous Guarayos Forestry Asscoaition (IRARAI) and the Community Centre Urubichá (CECU).

During the opening hours of the workshop stakeholders were presented with the combined from the previous workshop, which was enriched from the field-work and asked to validate its accuracy for the local area (see 4.2.2).

In order to introduce the stakeholders to the concept of scenarios and the potential of using them within ROBIN a presentation was made, which was used to highlight the potential scenarios that could be used as a guide within the building process. This presentation also

introduced two potential scenarios, which covered a 'paradise' scenario and a 'unequal chaotic' scenario. After the presentation a period of discussion was encouraged in order to decide the means in which the scenarios would be targeted for Guarayos. It was agreed that two scenarios would be developed and named- 'good life' and 'bad life'.

During the first working sessions related to the scenarios, stakeholders were offered the opportunity to brainstorm of potential factors that would be present in these two future scenarios and can be seen in 4.2.3.

4.2.2 *Validation of the combined and enriched FCM of the present*

The second workshop performed in Ascensión de Guarayos was as previously mentioned used to validate the combined map from the previous workshops. It was equally used as an opportunity for stakeholders to validate whether the additions made to the map from data gathered in the field were accurate to the present situation in the area.

Stakeholders stated that they believed the map presented to them was accurate of the present situation and that the additions made from the field-work successfully and accurately enriched the map further. However, stakeholders did suggest that one change should be made in the weighting of a single relationship between factors. They suggested that the weight between 'Illegal Mining' and 'Soil Erosion' should be increased from +0.3 to +0.5. The stakeholders stressed the importance of illegal mining within the region and the negative effect it was increasingly having upon the soil. Figure 31 highlights the validated map, with the changed weight shown in pink. Figures 32 and 33 demonstrate the dynamic analysis of this validated system, as well as a comparative analysis of the magnitude of impact upon variables in this validated map, compared with the enriched map (Figure 11).

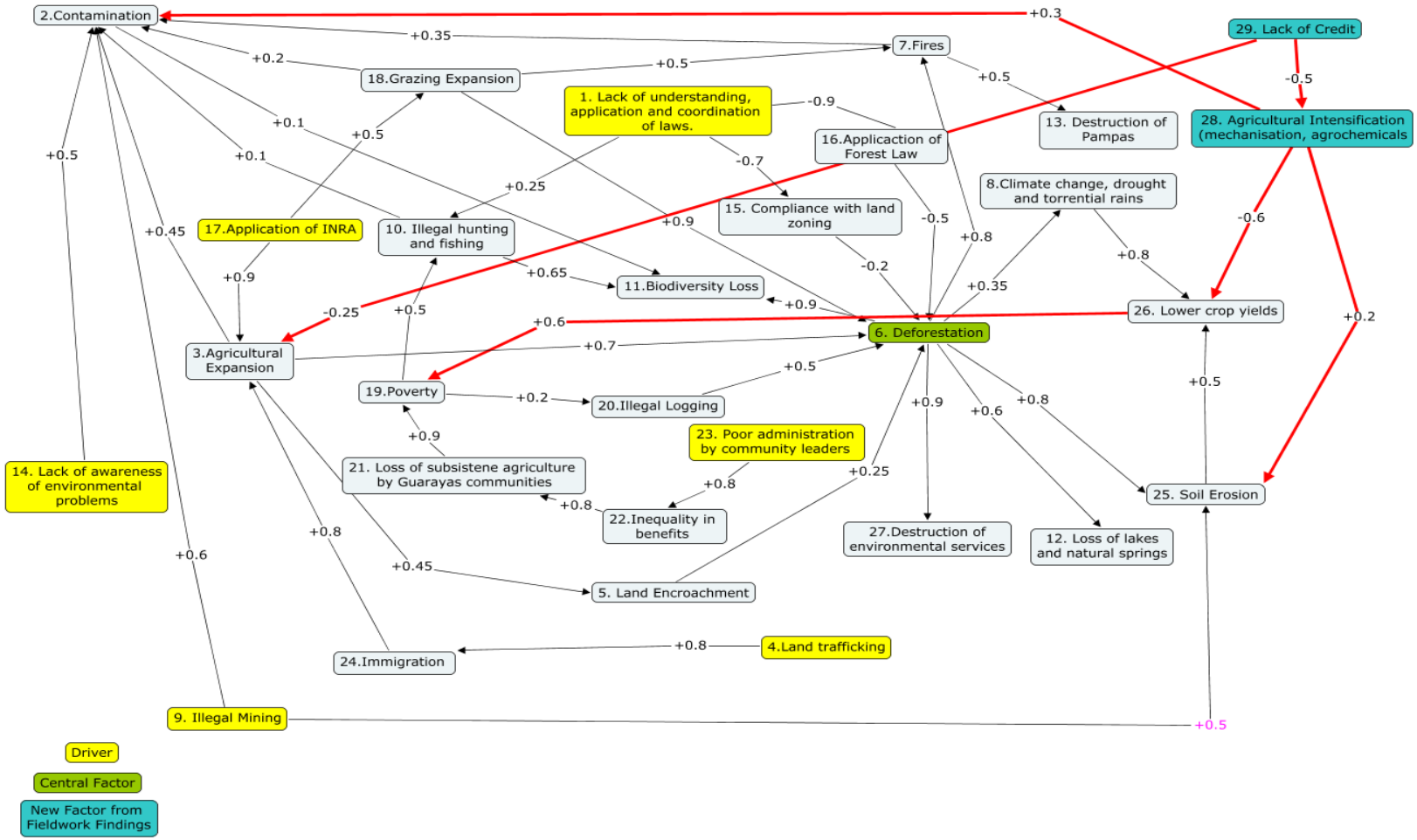


Figure 31. Enriched Fuzzy Cognitive Map validated by stakeholders in Ascensión de Guarayos.

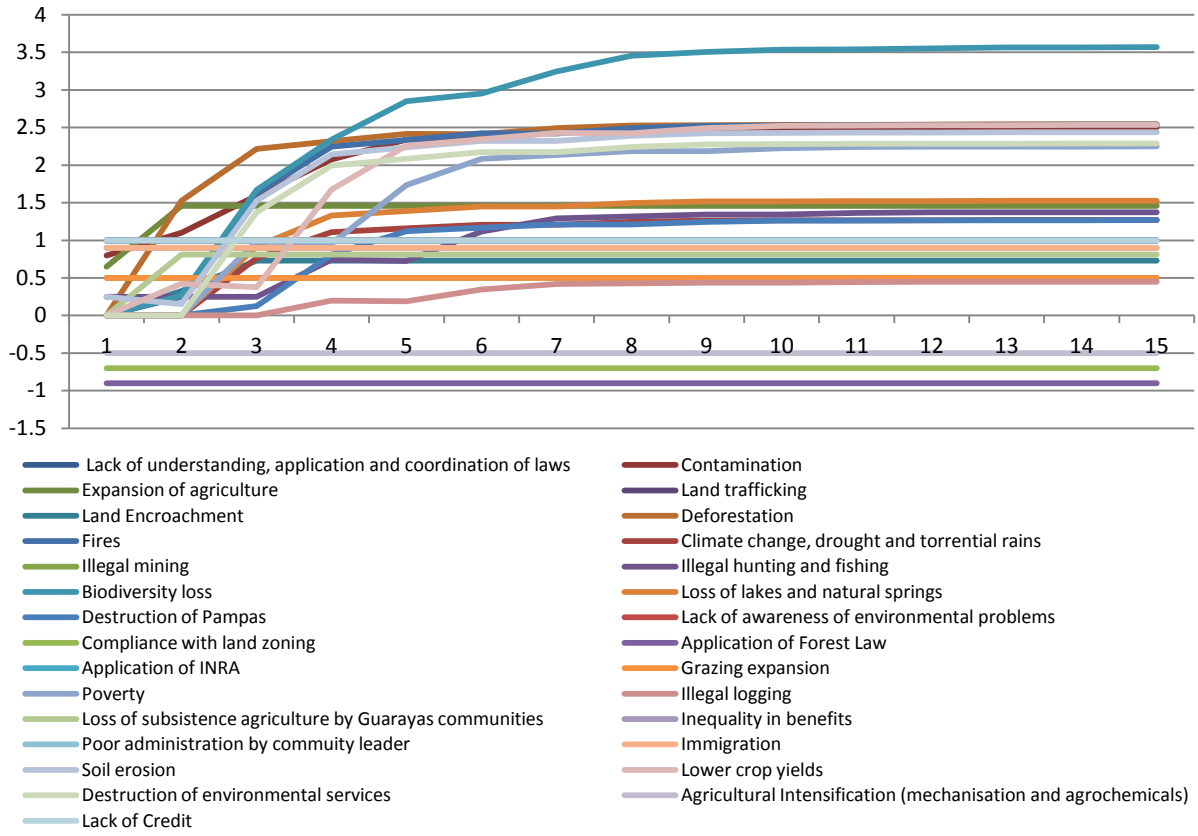


Figure 32. Dynamic analysis of the enriched and validated FCM of Ascensión de Guarayos.

The changes produced in the different factors are shown in Figure 33 (below) and compared to the results of the analysis of the non-validated map.

The dynamic analysis of this model shows a system almost identical to the enriched system with the principal effects being identical to those in the enriched system. The most relevant effects are:

- Biodiversity loss: with a magnitude of the effect of 3.57, greater than in the non-calibrated system
- Deforestation: with a magnitude of the effect of 2.54, lower than in the non-calibrated system
- Fires: with a magnitude of the effect of 2.54, lower than in the non-calibrated system

As compared to the non-validated map, it should be noted the increase in soil erosion, which makes sense as the stakeholders reiterated the increased importance of mining upon soil erosion. To a lesser extent, biodiversity losses are higher in this validated system, as is poverty, which is intuitive as in the system soil erosion directly effects crop yields, which in turn increases poverty. The increase in biodiversity loss may be coupled with this increase in poverty as within the FCM model, poverty results in increased illegal hunting, and in turn increased biodiversity loss. However, these changes should be put in proportion as they are

very small, especially when one compares them to the changes produced between the combined and enriched systems shown in Figure 13.

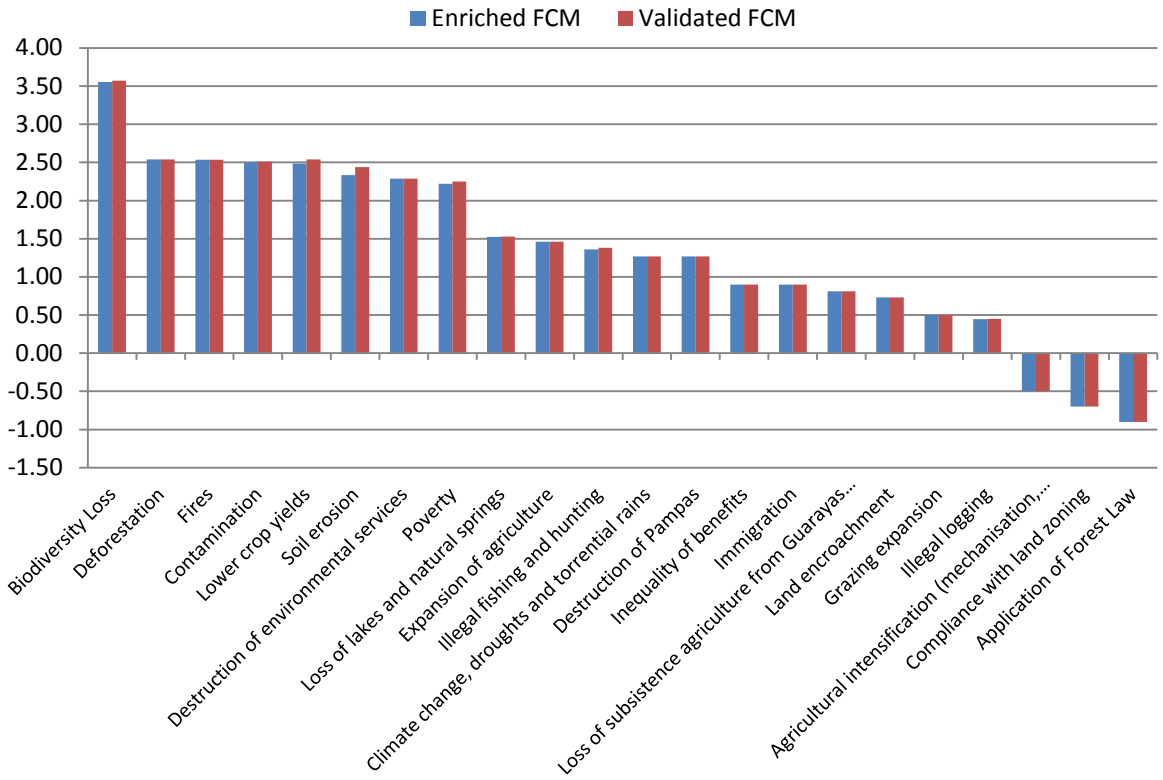


Figure 33. Comparison of the total magnitude of impact for each variable in the enriched and validated systems.

4.2.3 *Identified issues and driving-forces within the future scenarios*

In order to begin the discussion concerning the future state of the environment, a brainstorming session was facilitated for both scenarios by the following questions 'What will be future state of the natural environment and land use in Guarayos in 2050?' Where the following factors were identified for the 'good life' future scenario:

-Sustainable forest use
-Provision of air, water, food, medicine and wood
-Social environmental awareness
-Change of attitudes
-Care taken of rivers, lakes and wetlands
-Adequate use of agrochemicals
-Sustainable agriculture
-Law enforcement
-Better application of law
-Better technical capacity
-Subsistence farming
-Better understanding of law
-Better institutional coordination
-Increased awareness of the rules
-Better zoning
-Increased participation, socialisation of laws
-Controlled slash and burn
-Controlled expansion of commercial agriculture
-Less poverty
-Wood extraction
-Climate Change, more rain (desired)

In the 'bad life' future scenario stakeholders identified the following issues:

-Forest fires
-Deforestation, loss of vegetation
-Animal and plant destruction, biodiversity loss
-Indiscriminate hunting of wild animals
-Loss of animals
-Lack of local leadership
-Land encroachments
-Extreme weather (drought, flood)
-Flood
-Intense global warming
-Lack of drinking water
-Excessive mining
-Excessive use of agrochemicals
-Soil erosion, desertification
-Loss of traditional culture
-Corruption
-River Contamination
-Disease
-Food scarcity
-Discrimination
-Abuse of power
-Poor land use
-Local poverty
-Hurricanes
-Acid rain
-Big industry
-Infertile soil
-Water scarcity

After these brainstorming sessions and in order to develop the conceptual models and to begin the scenario building session each participant was offered the opportunity to suggest three factors that they considered would be present in these future scenarios ('good life' and 'bad life'). Following this, participants were asked to suggest which factors in their opinion had the greatest importance in these two future scenarios. The results of this activity can be seen in the two spider-grams below, representing the responses of the participants from the groups when considering each scenario. The values displayed are standardised.

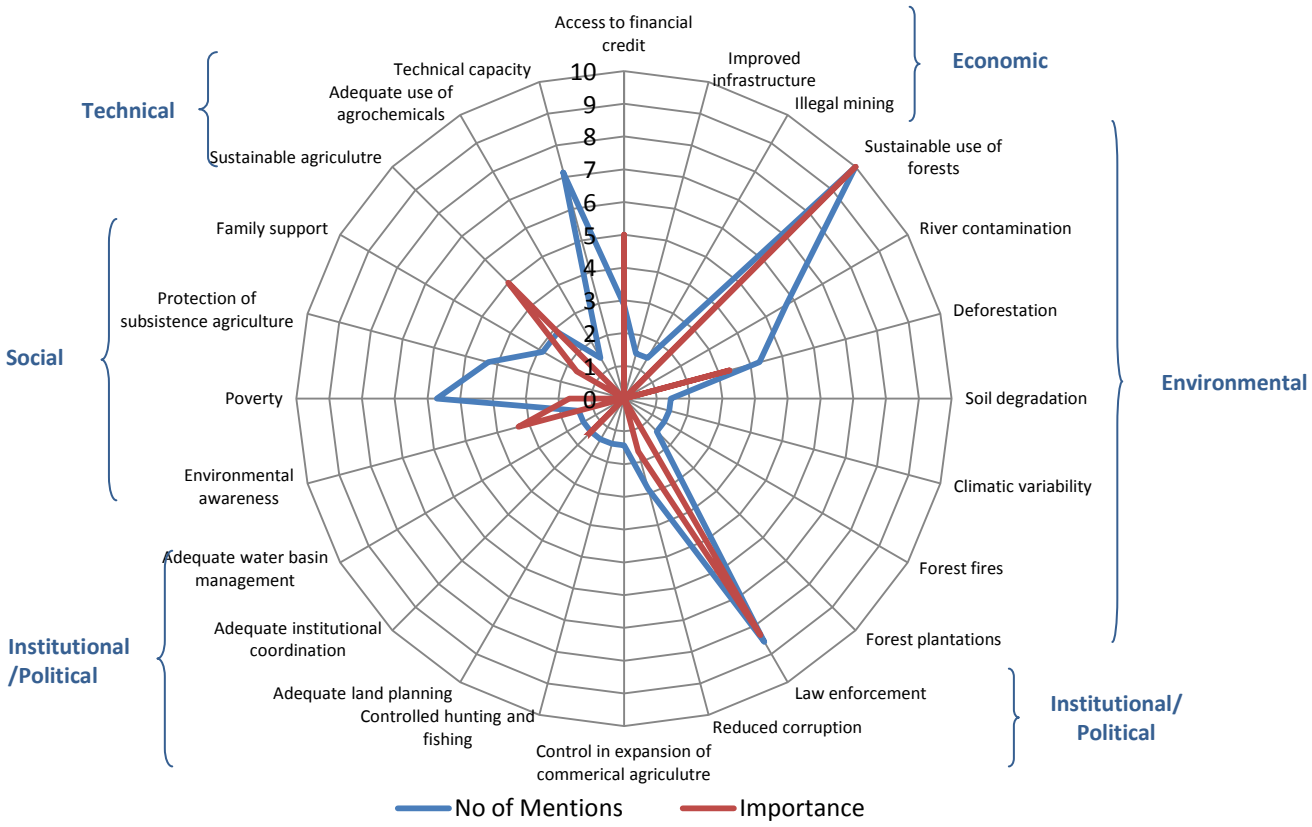


Figure 34. Spider-gram developed from the initial discussions concerning the 'good life' future state of the environment in Guarayos

The most relevant issues of the "good life" scenario are shown in the spider-gram shown in Figure 34. In this graph we can see that stakeholders built this scenario around the sustainable use of forests, as the most mentioned and most important factor. For attaining this, enforcement of laws appears as the second most mentioned and relevant factor. Other highly mentioned factors are poverty and technical capacity, but these are not as important as the access to financial credit and the sustainability of agriculture.

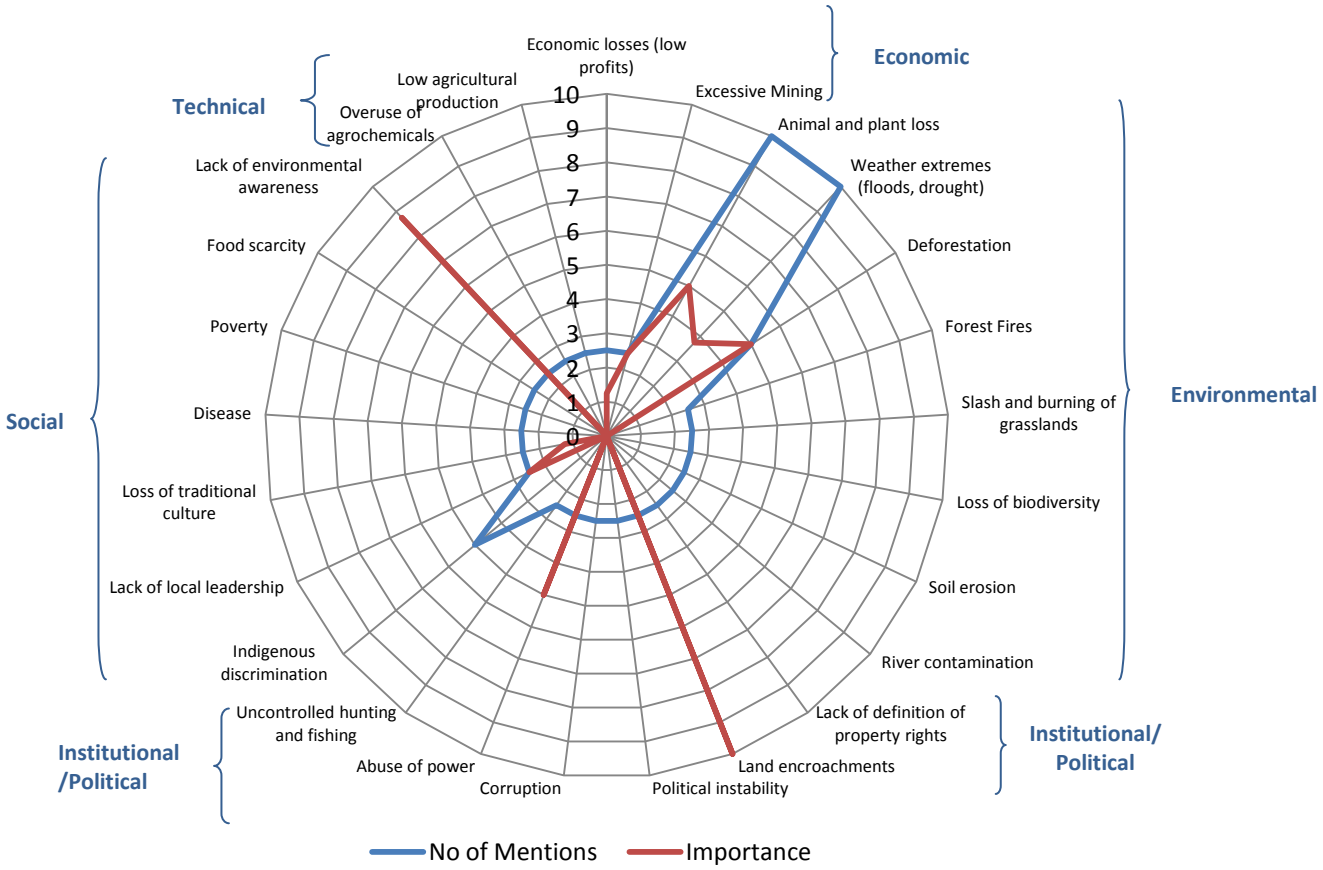


Figure 35. Spider-gram developed from the initial discussions concerning the 'bad life' future state of the environment in Guarayos

The "bad life" scenario was characterised by the factors reflected in Figure 35. The most mentioned elements in this scenario were animal and plant loss and weather extremes such as floods and droughts. Among the most relevant prominent factors in this scenario we find land encroachment and lack of environmental awareness.

The factors identified in both scenarios correspond to the areas of the environment, social, technical, economic and political. The most important ones are shown in the comparative Table 8.

Table 8. The most mentioned and most important factors mentioned by stakeholders during the future scenario workshop discussions in Guarayos.

	Good Life	Bad Life
Factors Most Mentioned	- Sustainable use of forests - Law enforcement - Technical capacity	- Animal and plant loss - Weather extremes - Indigenous discrimination - Deforestation
Most Important Factors	- Sustainable use of forests - Law enforcement - Deforestation - Environmental awareness	- Land encroachments - Lack of environmental awareness - Animal and plant loss

4.2.4 *Conceptual models (FCMs) and dynamic analysis of the future*

Building upon the list of identified factors and taking into account their importance, the group built a FCM for each of the two scenarios in which the different factors were linked to each other and the strength of those links were quantified in relative terms. Figures 36 and 39 show the FCMs built by the group for both the 'good life' and 'bad life' future scenarios respectively. In green the central factors and in yellow the drivers of the systems.

Figures 37 and 40 show the dynamic analysis of the systems represented in the FCMs for each scenario. Figures 38 and 41 show the total change produced to the different factors under the effect of the drivers of the systems within each scenario

The FCM built for the 'Good life' scenario includes 24 factors, 11 of which are drivers of the system. Among the 11 drivers, about 50% of them refer to improved governance, policies and implementation, including the following: protection of subsistence farming (policy), control in expansion of commercial agriculture, controlled hunting and fishing, controlled illegal mining, adequate institutional coordination, and reduced corruption. Other drivers considered in the map are improved infrastructures, increased technical capacity, access to financial credit, forest plantations, and environmental awareness. The central issues in this map are sustainable use of forests and sustainable agriculture, and in contrast to the map of the present, deforestation is not such a central factor.

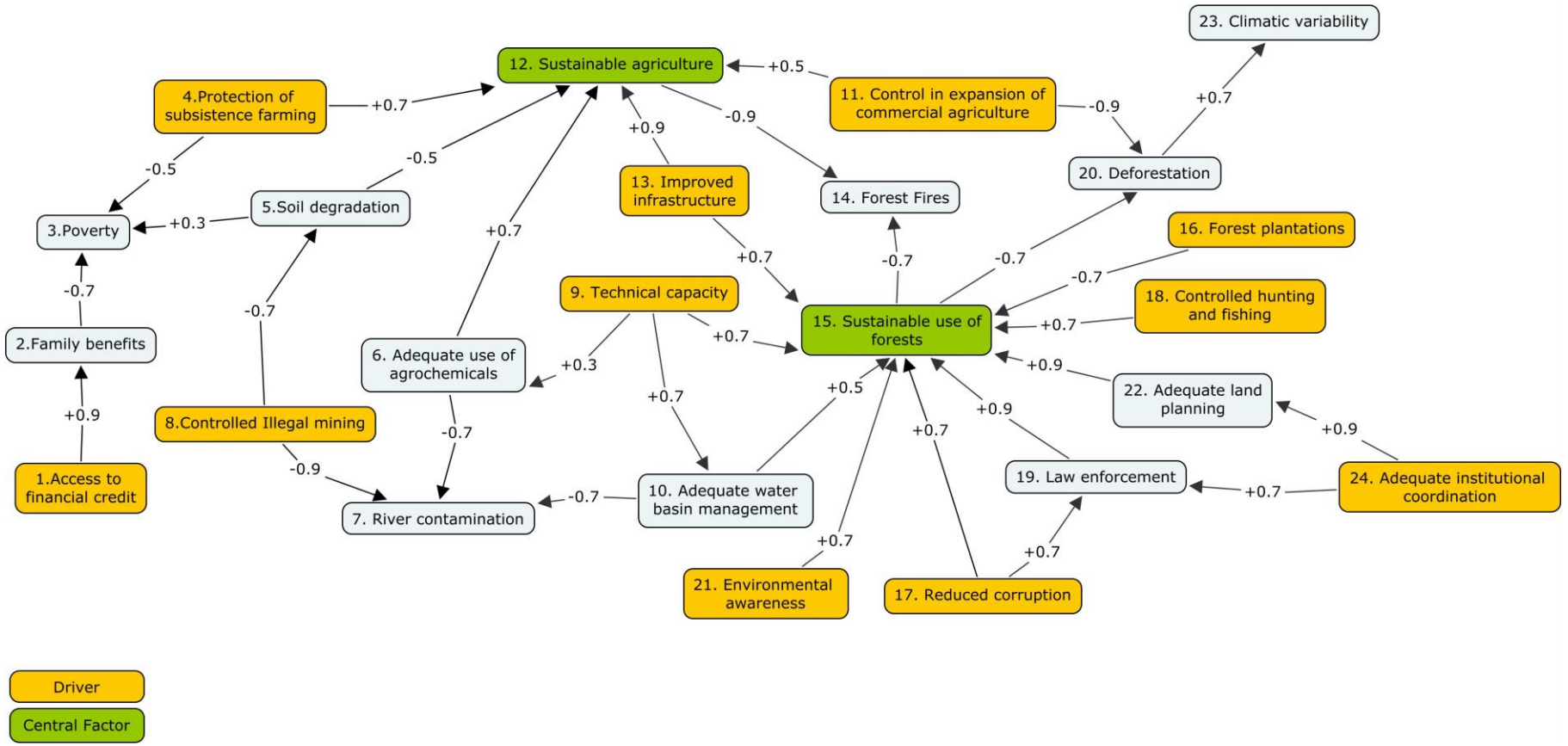


Figure 36. Fuzzy Cognitive Map of the 'good life' scenario in Ascensión de Guarayos

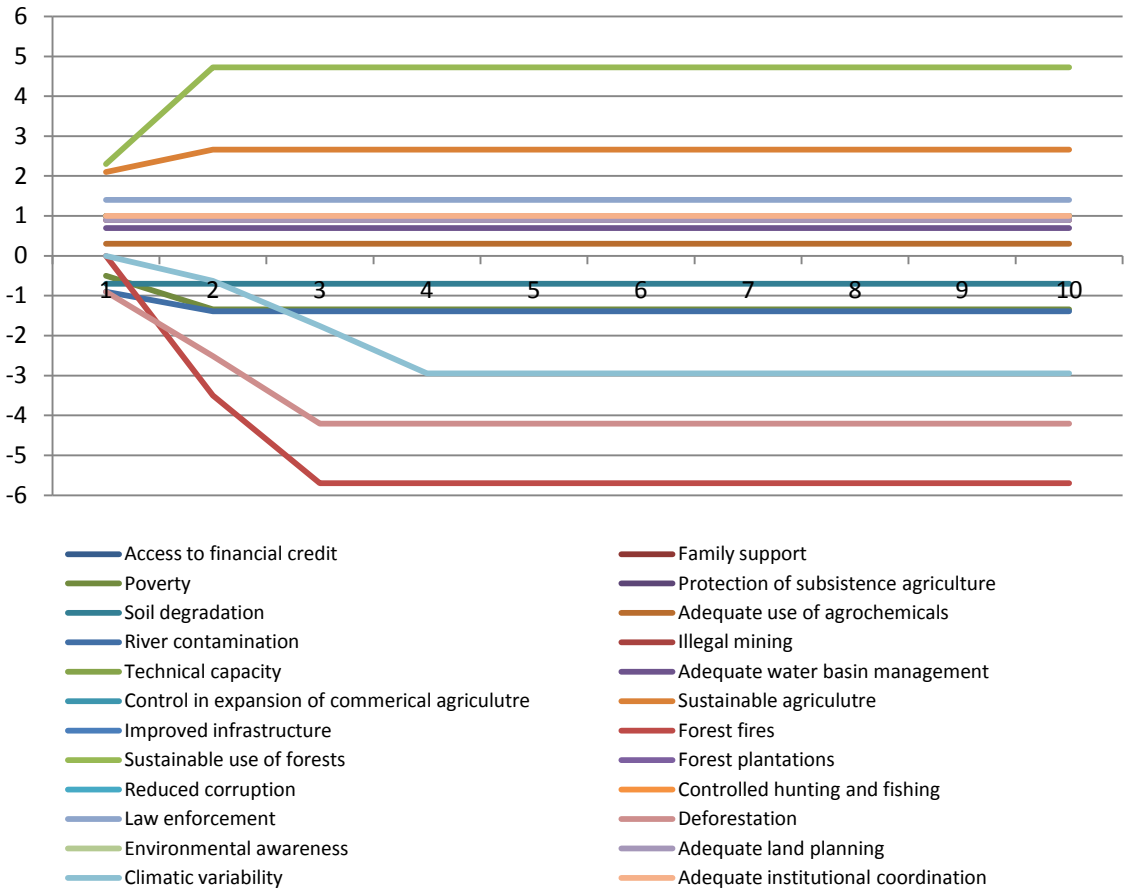


Figure 37. Dynamic analysis of the 'good life' future scenario in Ascensión de Guarayos

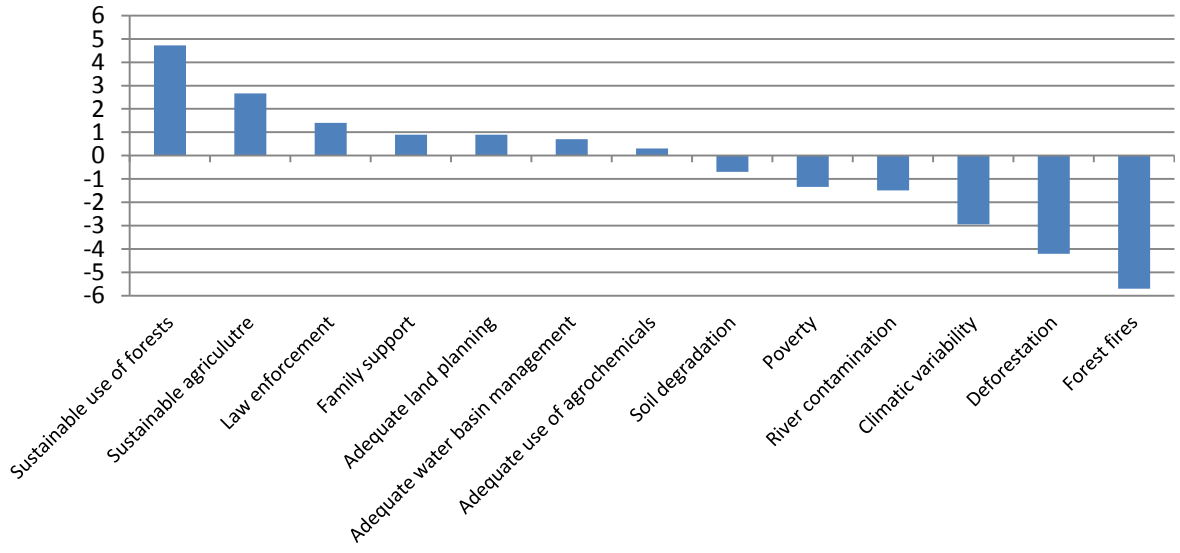


Figure 38.Total magnitude of impact on each variable within the 'good life' future scenario.

The dynamic analysis results for the 'Good life' scenario are shown in Figure 37 and Figure 38. Figure 37 shows the accumulated change produced in the different variables after each iteration. The final changes produced in the different factors when all drivers act together are shown in Figure 38. This figure shows that in the described 'good life' scenario the main effects are:

- A reduction of forest fires (magnitude of change -5.7)
- Sustainable use of forests (magnitude of change 4.7)
- A reduction of deforestation (magnitude of change -4.2)
- A reduction of climate variability (magnitude of change -2.9)
- Sustainable agriculture (magnitude of change 2.7)

The map shown in Figure 39 for the 'Bad life' scenario is a rather simple map that includes 22 factors. Of these factors, 7 act as drivers of the system, namely uncontrolled hunting and fishing, slash and burning of grasslands, excessive mining, excessive use of agrochemicals, political instability, lack of local leadership, and lack of environmental awareness. The central factors in this map are biodiversity loss and poverty.

The dynamic analysis of this map is illustrated in Figure 40 and Figure 41. As all factors have been defined in a negative sense (e.g. 'low agricultural production' instead of 'agricultural production') all the effects are produced in the positive side of the axis (i.e. the outcomes (which are defined in a negative sense) are of greater magnitude). The final cumulative effect produced to each factor is shown in Figure 41. There we can see how the most relevant outcomes of this scenario are:

- Biodiversity loss (magnitude of change 2.8)
- Poverty (magnitude of change 1.9)
- River contamination (magnitude of change 1.8)
- Forest Fires (magnitude of change 1.6)

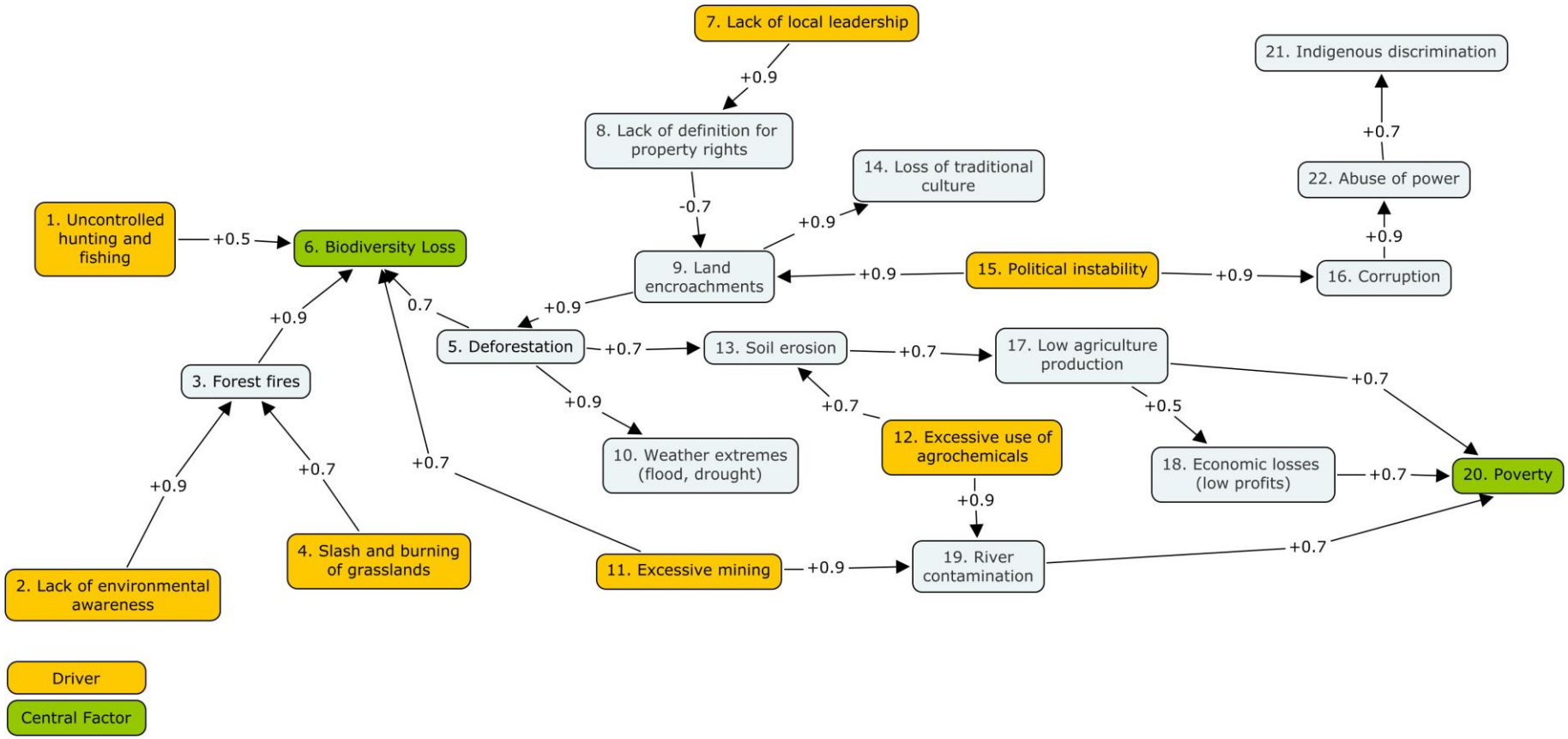


Figure 39. Fuzzy Cognitive Map of the 'bad life' scenario in Ascensión de Guarayos.

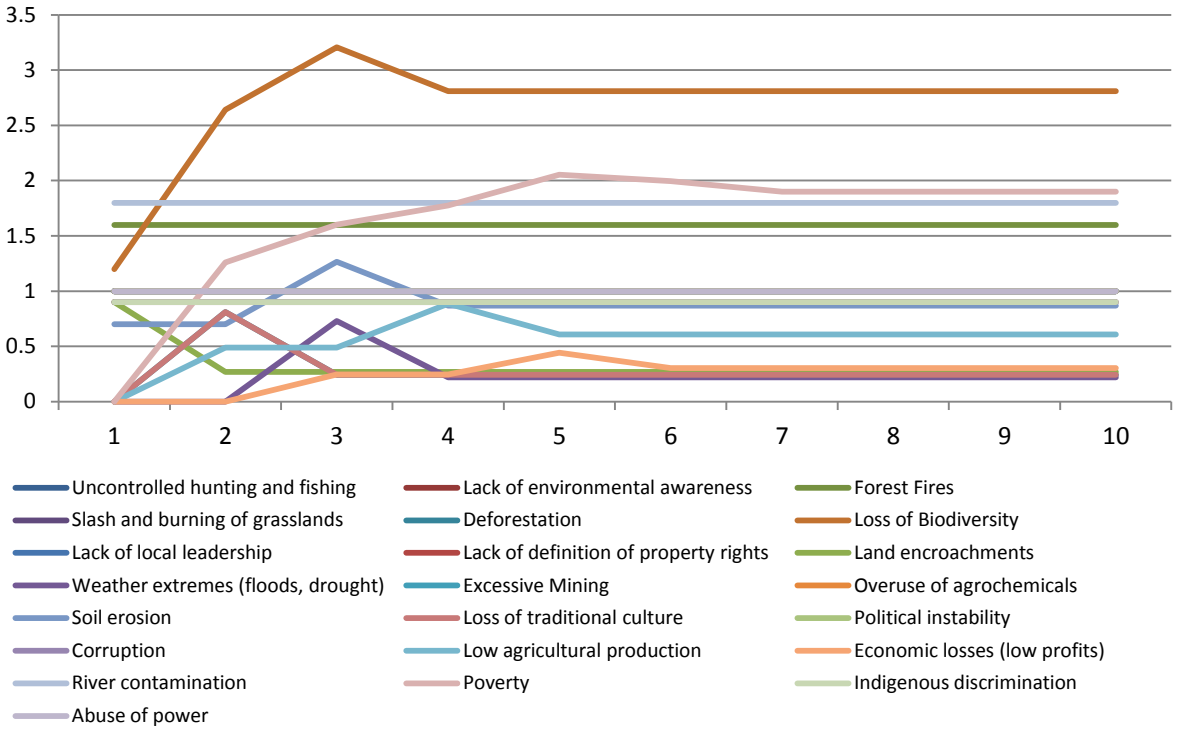


Figure 40. Dynamic analysis of the 'bad life' scenario in Ascensión de Gaurayos

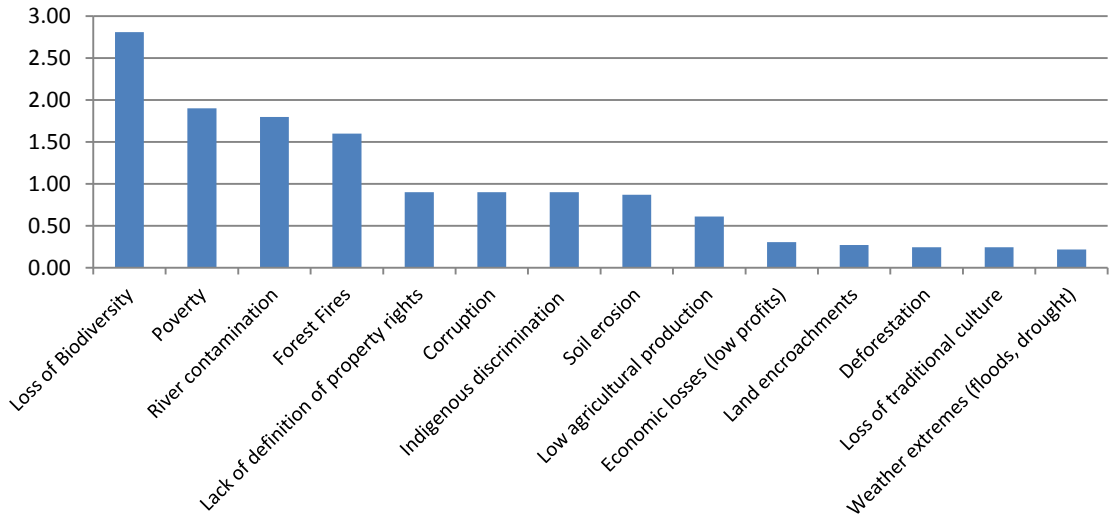


Figure 41.Total magnitude of impact on each variable within the 'bad life' future scenario.

4.3 Brazil

4.3.1 *Objectives and organisation of the workshop*

The objective of this workshop was to gain an understanding of stakeholders' perceptions of two scenarios relating to the future of their local environment, with them asked to consider the factors that would be prevalent within each scenario.

The workshop held on the 28th of November 2013, was attended by 26 stakeholders from a range of different interest groups including; Ministry of Agriculture (MAPA), The Federal University of Western Pará (UFOPA), Chico Mendes Institute for Biodiversity Conservation (ICMBIO), Hope Foundation (IESPES), EMBRAPA Eastern Amazon, Tapajós Community Leaders, The Nature Conservancy (TNC) and Luiz de Quieroz College of Agriculture (ESALQ-USP).

In order to introduce the stakeholders to the concept of scenarios and the potential of using them within ROBIN a presentation was made, which was used to highlight the potential scenarios that could be used as a guide within the building process. After the presentation a period of discussion was encouraged in order to decide the means in which the scenarios would be targeted for Flona Tapajós. It was agreed that two scenarios-desired and undesired - would be formulated and that all stakeholders would remain in one group in order to produce them.

4.3.2 *Identified issues and driving-forces within the future scenarios*

In order to develop the conceptual models and to begin the scenario building session each participant was offered the opportunity to suggest three factors that they considered would contribute to the future scenarios (desired or undesired). Following this, participants were asked to suggest which factors in their opinion had the greatest importance in these two future scenarios. The results of this activity can be seen in the two spider-grams below. The values displayed are standardised.

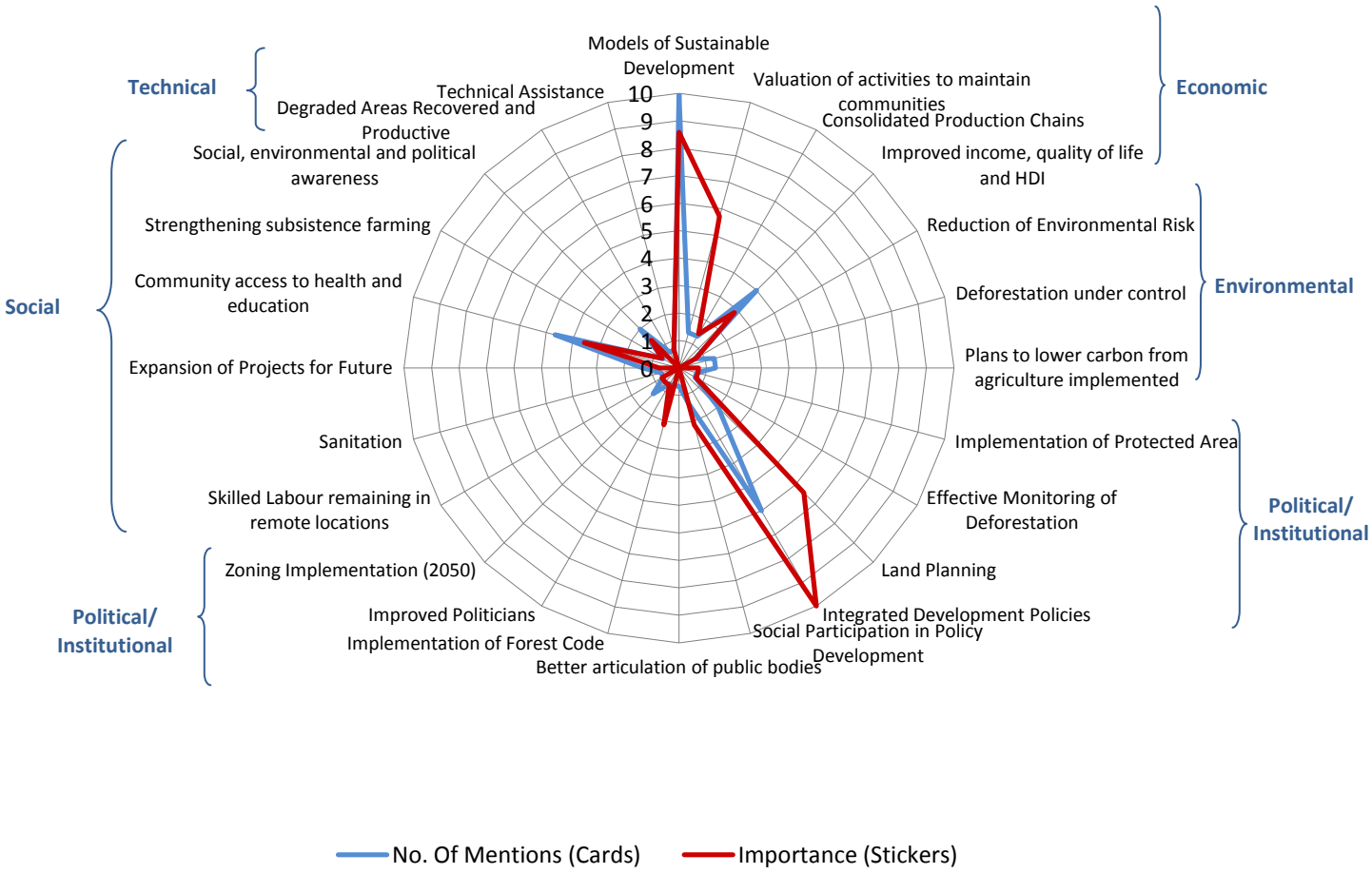


Figure 42. Spider-gram developed from the initial discussions concerning the desired scenario in Flona Tapajós.

The 'Desired' future scenario is dominated by sustainable development and based on policies for integrated development, being the most mentioned factors and the most important ones. Other relevant elements in the scenario are land planning and the valuation of activities to maintain the local communities.

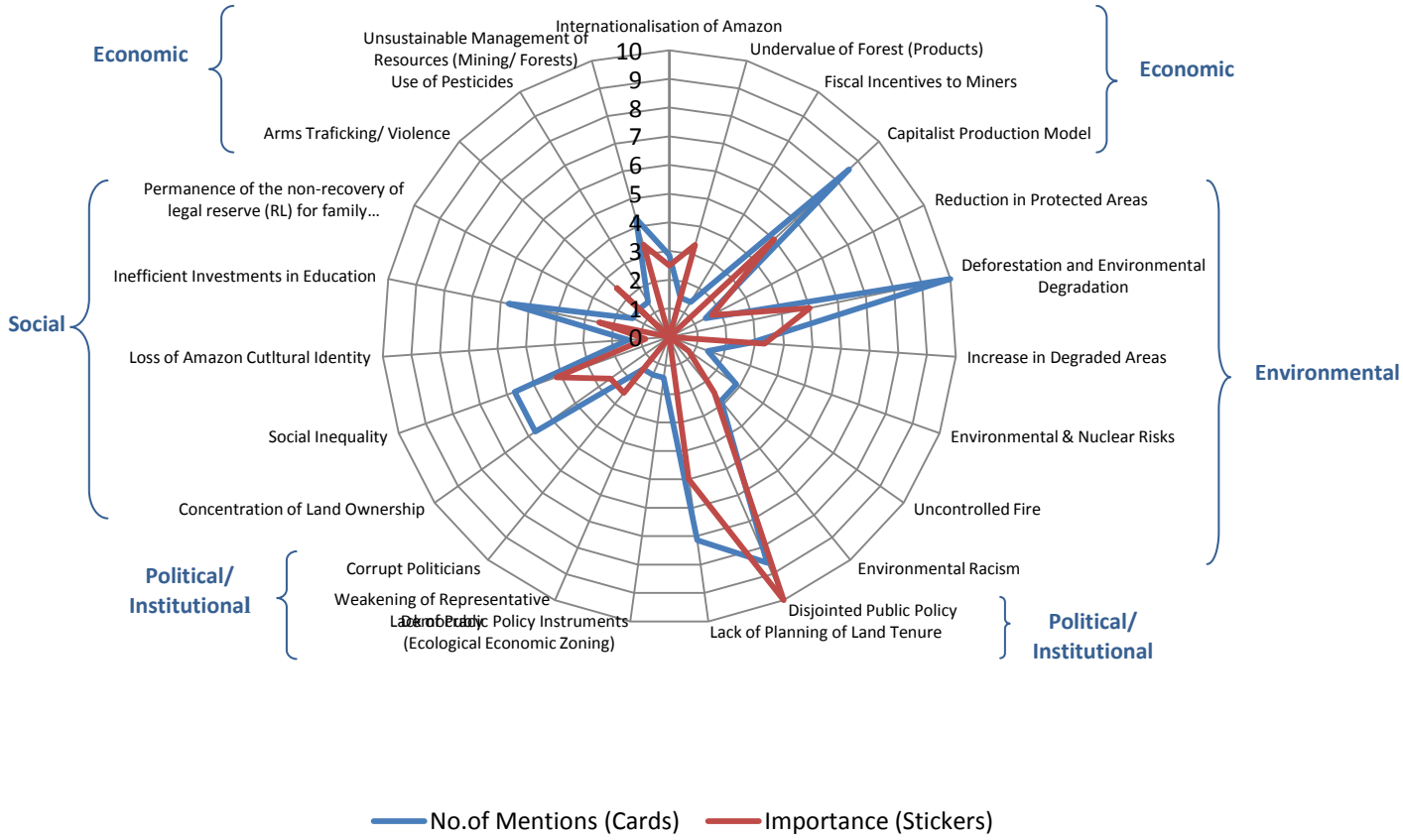


Figure 43. Spider-gram developed from the initial discussions concerning the undesired scenario in Flona Tapajós.

As shown in Figure 43, the most mentioned factors in the 'Undesired' future scenario are deforestation and environmental degradation, capitalist production model, disjointed public policy, and lack of planning of land tenure. From these factors, the most important one according to stakeholder views is the disjointed public policy.

Whilst in the 'Desired' future scenario we can see a clear dominance of social and political/institutional issues, the undesired scenario is dominated by negative social and environmental issues.

The most mentioned and important factors from the perspective of the stakeholders are summarised and compared in Table 9.

Table 9. The most mentioned and most important factors mentioned by stakeholders during the future scenario workshop discussions in Flona Tapajós.

	Desired	Undesired
Factors Most Mentioned	- Models of Sustainable Development - Integrated Development Policies - Community Access to Health and Education	- Deforestation and Environmental Degradation - Disjointed Public Policy - Capitalist Production Model
Most Important Factors	- Integrated Development Policies - Models of Sustainable Development - Land Planning	- Disjointed Public Policy - Capitalist Production Model - Deforestation and Environmental Degradation - Lack of Planning of Land Tenure

4.3.1 *Conceptual models (FCMs) and dynamic analysis of the future*

Building upon the list of identified factors and taking into account their importance, the group concentrated on the 'Desired' future scenario in order to unveil how the institutional and policy context along with the socio-economic contexts may evolve in a sustainability oriented future. The description and analysis of such a future context will lay the foundation for identifying specific options and policy actions that may contribute to biodiversity conservation and climate change mitigation. As such, participants built a FCM for the scenario in which the different factors were linked to each other and the strength of those links was quantified in relative terms. Figure 44 shows the FCM built by the group for the 'Desired' future scenario. In green the central factors and in yellow the drivers of the systems.

As seen in Figure 44, the FCM built for the 'Desired' future scenario represents a system of low complexity without any feedbacks. It includes 24 variables from which 4 act as drivers of the system. These drivers refer to important socio-institutional changes in the future situation in Tapajós, and they include social participation in policy development, social environmental and political awareness, community access to health and education and better articulation of public bodies. The central factors in the represented future system are integrated development policies and improved income, quality of life and Human Development Index (HDI).

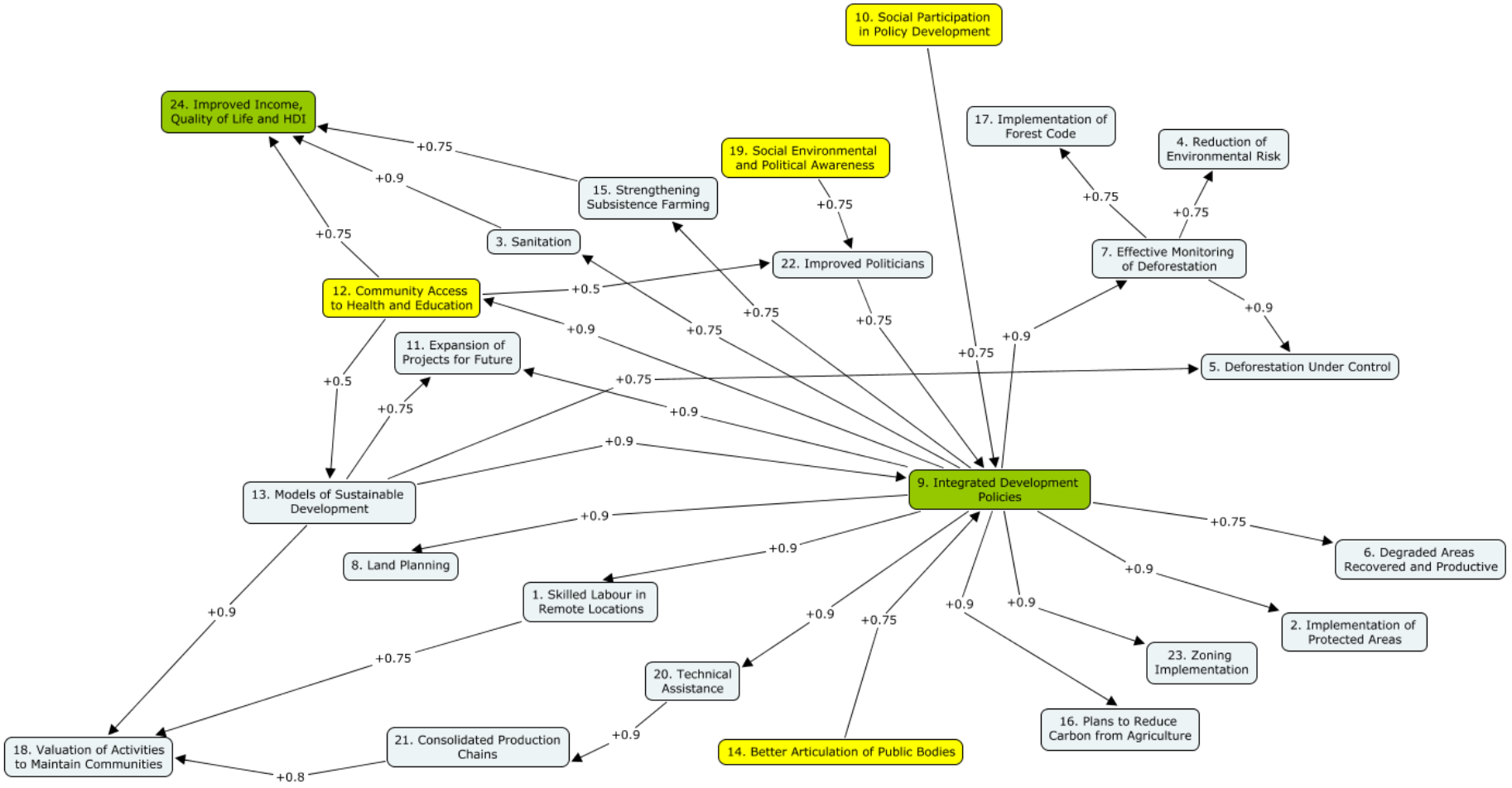


Figure 44. Fuzzy Cognitive Map of the 'Desired' scenario in Flona Tapajós.

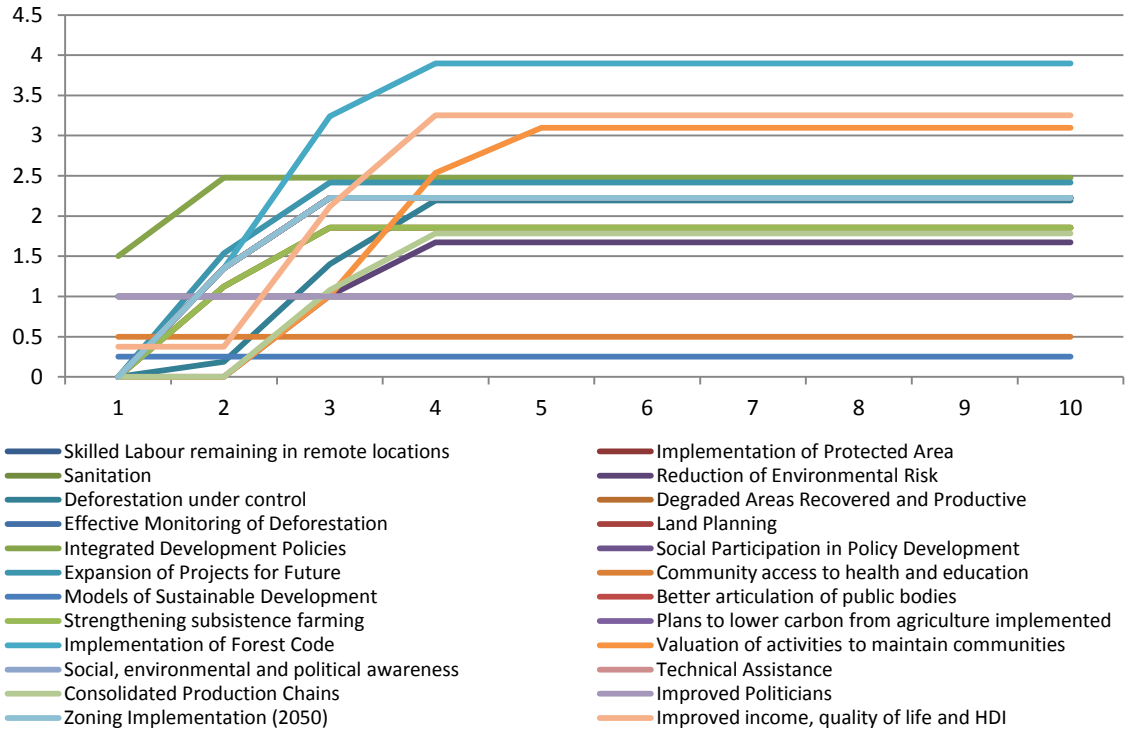


Figure 45. Dynamic analysis of the desired future scenario FCM in Flona Tapajós.

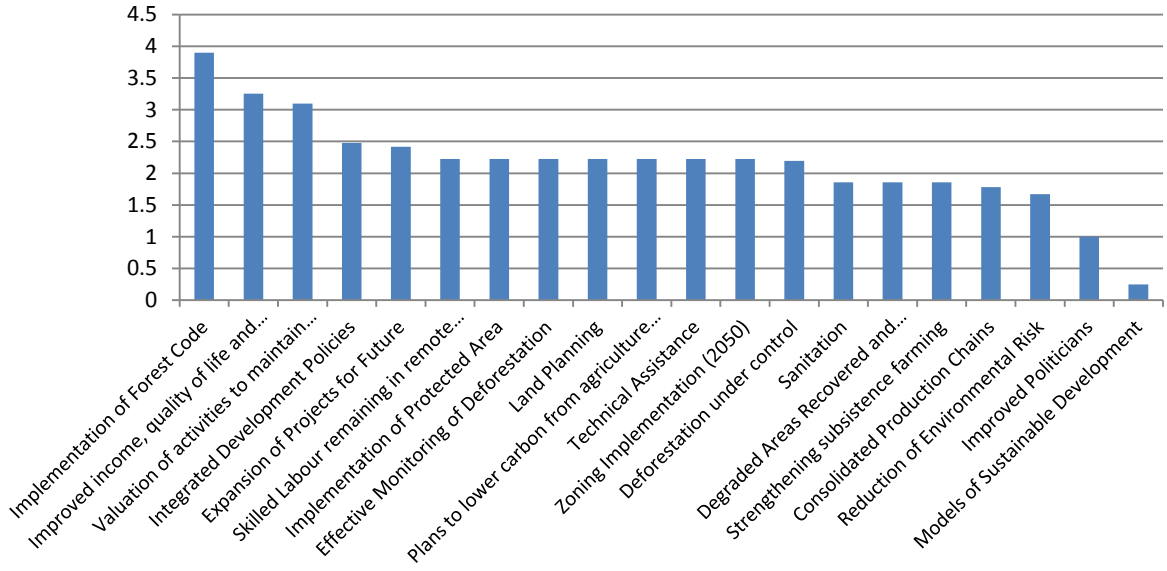


Figure 46. Total magnitude of impact on each variable within the desired scenario FCM.

Figure 45 shows the dynamic analysis of the system represented in the 'Desired' scenario FCM, with Figure 46 demonstrating the total change produced to the different factors under the effect of the drivers of the system.

One can see that the analysis shows a system in which the principal effects are:

- Implementation of Forest Code (magnitude: 3.89)
- Improved Income, Quality of Life and HDI (magnitude: 3.25)
- Valuation of Activities to Maintain Communities (magnitude: 3.09)

4.4 Comparative Analysis of the Future Scenarios and FCMs

The following section develops upon the findings from the two case study sites where future scenarios were developed. This section formulates a comparative analysis between conceptual models developed and the systems they represent for both the future 'Desired' and 'good life' scenarios in Bolivia and Brazil.

Table 10. Summary of the results from the 'desired'/ 'good life' future scenario workshops.

Key Issues		Bolivia	Brazil
Central Factors		- Sustainable agriculture - Sustainable use of forests	- Integrated Development Policies - Improved Income, Quality of Life and HDI
Drivers	Social	- -Protection of subsistence farming - Environmental awareness	- Community access to health and education - Social environmental and political awareness
	Economic	- Access to financial credit - Controlled illegal mining - Improved infrastructure	
	Political	- Adequate institutional coordination - Reduced Corruption	- Better articulation of public policy - Social participation in policy development
	Environmental	- Control in expansion of commercial agriculture - Controlled hunting and fishing - Forest plantation	
	Technical	- Technical Capacity	

Table 11. Summary of the results from the 'undesired'/ 'bad life' scenario workshops.

Key Issues		Bolivia	Brazil
Central Factors		- Biodiversity Loss - Poverty	
Drivers	Social	- Lack of local leadership - Lack of environmental awareness	
	Economic	- Excessive mining	
	Political	- Political instability	
	Environmental	- Slash and burning of grassland - Uncontrolled hunting and fishing	
	Technical	- Excessive use of agrochemicals	

Through analysis of the results from the second stakeholder workshops one can gain an insight into the perceptions of stakeholders when asked to consider two, almost diametrically opposed futures.

In terms of the two workshops dedicated towards a more positive (desired/ good life) future one can see two very different models produced. In the Bolivian example, stakeholders have placed sustainable agriculture and use of forest as central factors, whereas in Brazil, these perhaps surprisingly aren't environmental. The stakeholders in Brazil developed a model where the integration of policies aimed at development, as well as improved income, quality of life and HDI were central, clearly, socially orientated factors. Whether the importance of these central factors are merely a fragment of the stakeholders present at each workshop, or whether it reflects something deeper socially in each country is not for discussion here, but it is interesting to note that in Bolivia both central factors are environmental and in Brazil, both are social. The continuation of such a theme can be seen in that none of the drivers in the Brazilian map are environmental, whereas they represent just under a third in Bolivia.

In Bolivia, drivers of the system come from a range of areas including; social, economic, political, environmental and technical, further highlighting a distinct difference with that of Brazil. From a social perspective, increased environmental awareness (like Brazil) is considered to be an important factor for such a 'good-life' future. Politically, control of corruption and adequate institutional coordination are both considered to be important factors within the system. Adequate institutional coordination echoes comments made within the first workshop related to the present, that the lack of co-ordination between institutions has driven the situation currently found in Ascensión de Guarayos. The economic factors mentioned and demonstrated as drivers can be seen as providing alternatives to local economy through development of infrastructure, as well as offering credit. This may also be supported, when considering the driver 'technical capacity' as a potential means for improving the incomes from

potentially agriculture through improved technical and financial capacity. This suggestion may be countered by the 'control of expansion of commercial agriculture' being a driver, but one can perceive those economic factors and this factor as driving more intensive and less extensive agriculture in this future.

The drivers in Brazil are different to those of Bolivia and as previously mentioned are more heavily focussed upon social and political drivers. In particular, social interactivity in policy development, social awareness in politics, as well as the importance for the articulation of policies to the public demonstrate the vital nexus that social and political factors have in this future. It is evident, that from the perspective of the Brazilian stakeholders, a 'desired' future would be dependent upon social development and political inclusivity and communication. It should be further noted, that there is very little mention to direct environmental factors within this map, beyond factors such as reducing environmental risk, or implementation of protected areas, which can be perceived as being social or political, rather than environmental. One therefore can assume that from the perspective of stakeholders, that in a future so described, the social and political improvements would by default result in reduced deforestation or biodiversity loss mentioned as being important in the FCM of the present in Flona Tapajós.

The factors highlighted in Bolivia are a variety of specific problems of the present being addressed and resulting in the 'good-life' future, whereas in the case of Brazil, the factors highlighted are far more centred upon political and social improvement, rather than directly addressing those found in the present FCM.

In the case of Bolivia, the drivers of the system in this 'bad-life' scenario are in general counters to those found in the 'good-life':

- Environmental awareness- lack of environmental awareness
- Controlled illegal mining- excessive mining
- Controlled hunting and fishing- uncontrolled hunting and fishing

In the case of the central factors of the system in the 'bad-life' scenario in Bolivia, biodiversity loss and poverty were mapped as being central to this system. These can, with a certain liberty, be equally considered as being opposites of those found in the 'good-life' scenario; sustainable agriculture and biodiversity loss.

4.5 Stakeholder's Evaluation of the 'Future' Workshops

Similarly to the process of the workshops relating to the present situation, a questionnaire accompanied the future scenario workshops to get a better understanding of the perceptions of the participants relating to the workshop in general. In particular, stakeholders were asked to comment on the utility of the workshop, and process of choosing and developing the scenarios. The following is a brief overview of the opinions offered by the stakeholders when responding to a questionnaire relating to the workshop. Please note that the findings below and the percentages shown represent the responses of those stakeholders that responded to each question, rather than a percentage of all stakeholders. Figure 47 representing the responses to a 'mood-o-meter' performed at the end of the workshop.

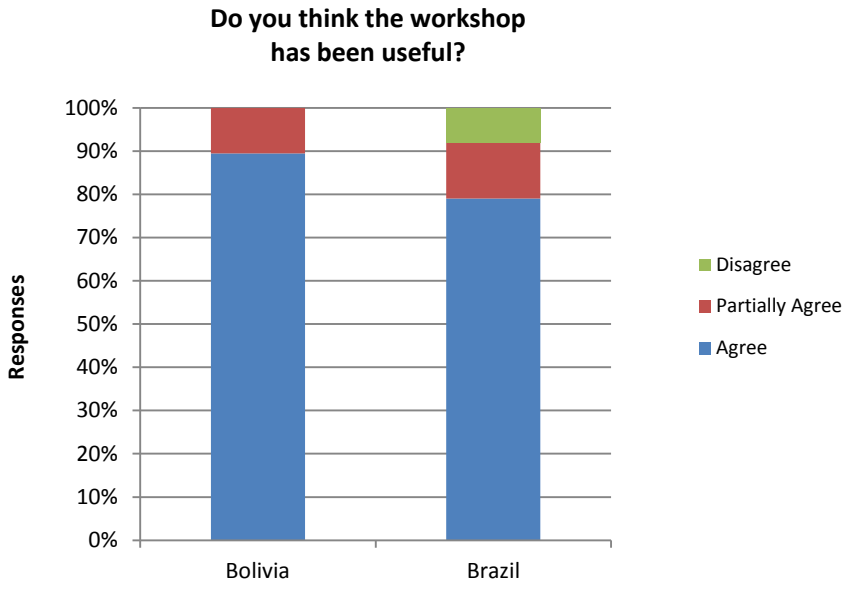


Figure 47. Stakeholder perceptions on the utility of the workshops.

Across the two sites the workshops received high approval levels, with over 75% of stakeholders in both countries stating that the workshops had been useful. Stakeholders in Brazil were the least optimistic about the workshop's utility, with only 79% agreeing, and 8% disagreeing. In Bolivia however, the stakeholders were more optimistic, with 89% stating that they agreed that it had been useful.

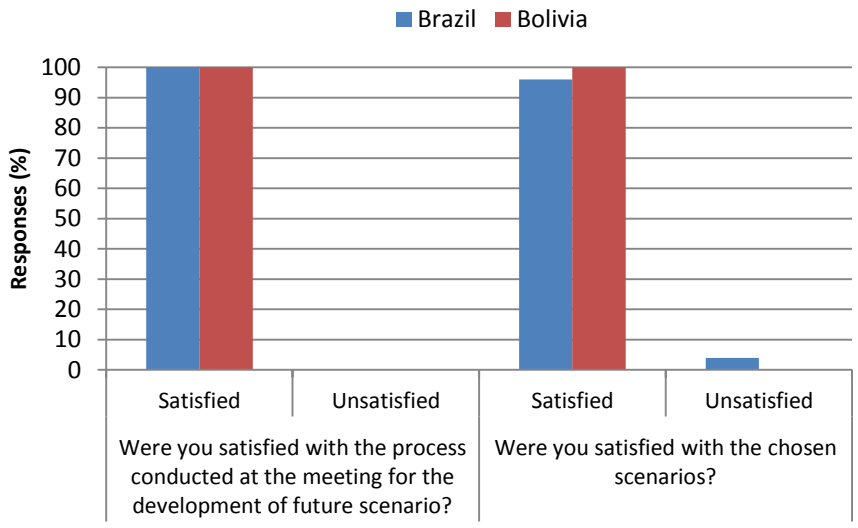


Figure 48. Stakeholder's responses to questions relating to choice of scenarios within the workshop.

In terms of the development and choosing of the scenarios as shown in Figure 48, stakeholders in both Bolivia and Brazil stated that they were entirely satisfied with the process of developing the scenarios. However, when asked whether they were satisfied with the scenarios eventually chosen for the workshop (Figure 48), 4% of stakeholders in Brazil stated that they were not. This may be something to consider for the future, that although the process for developing the scenarios is considered highly satisfactory, that the actual scenarios chosen at the end may need to be more inclusive.

These results show the strength of the methodology used, as well as the facilitators who administered it, when considered that in both countries there were considerable differences of opinion in choosing the scenarios (Figure 49) but in the end a considerable majority of stakeholders stated that they were satisfied with the choice. In Bolivia, 45% of respondents stated that there were many differences of opinion whist choosing the scenarios, with only 25% stating that there were no differences. In Brazil however, the difficulty in choosing scenarios is clear, with only 4% stating that there were no differences of opinion, with 54% stating that there were considerable differences and 41% stating that there were some differences.

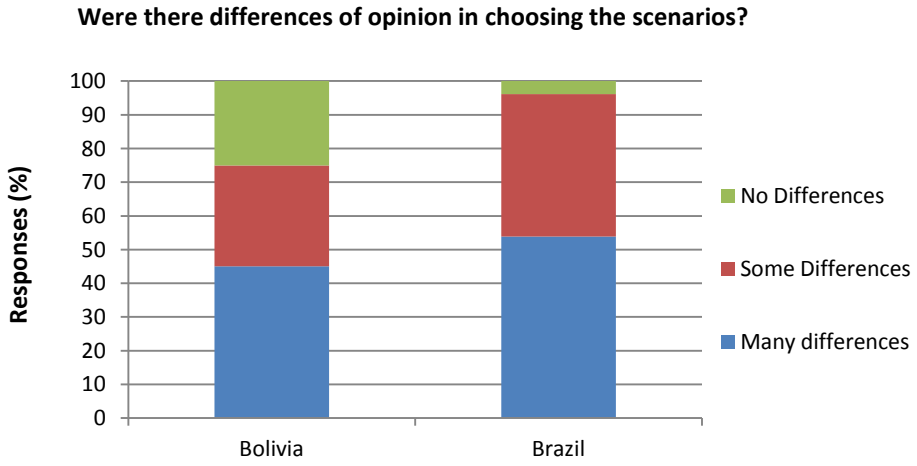


Figure 49. Stakeholder responses to the scale in which opinions differed.

The value of these workshops can be seen from the results in Figure 50. In both Bolivia and Brazil over 80% of respondents stated that they agreed that the use of scenarios is useful in the development of policies, which demonstrates that although there may have been differences of opinion in developing the scenarios, stakeholders are fully aware of the importance of such scenarios.

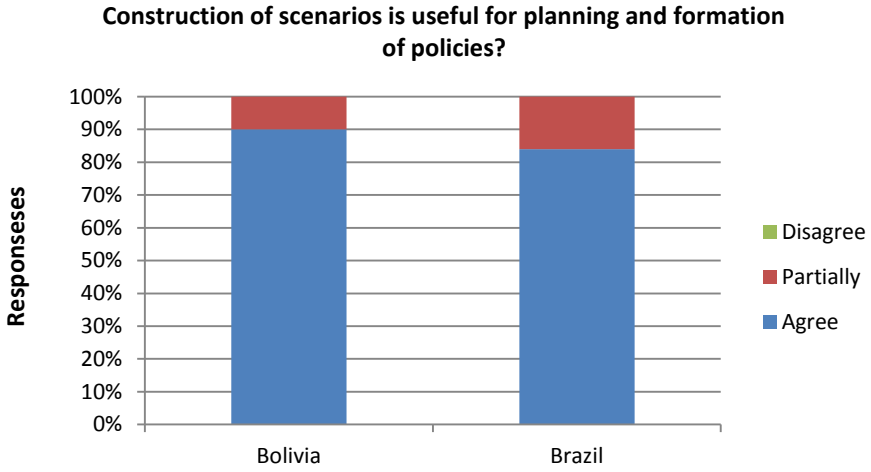


Figure 50. Stakeholder responses to the utility of scenarios development.

Figure 51 offers an insight into the perceptions of the stakeholders present at the second workshops. Only 45% of stakeholders in Bolivia and 60% in Brazil agreed that other participants in the workshops were able to express their opinions, with the others stating that they partially agreed with this statement, which is considerably lower than in the first workshops. However, when asked whether they believed that their own opinions and ideas were taken into account, over 70% responded that they agreed in Bolivia and 70% in Brazil, with 4% stating that they did not believe this to be true.

Showing an improvement on the first workshop, over 80% of stakeholders completely agreed that the workshop in Bolivia met their expectations, compared to just under 80% in the first workshop. In Brazil however, only 64% stated that this was the case, down from over 80% in the first workshop. Highlighting the success of the methodology and of those implementing it during the workshop can be seen by the stakeholder's responses to the questions relating to whether the workshop has improved their understanding, 73% of respondents totally agreed with that the workshop had improved their understanding in Bolivia and 71% in Brazil. 85% and 80% (Bolivia and Brazil) of respondents stated that working with scenarios helped them imagine the future, clearly highlighting the benefits of the scenario workshop.

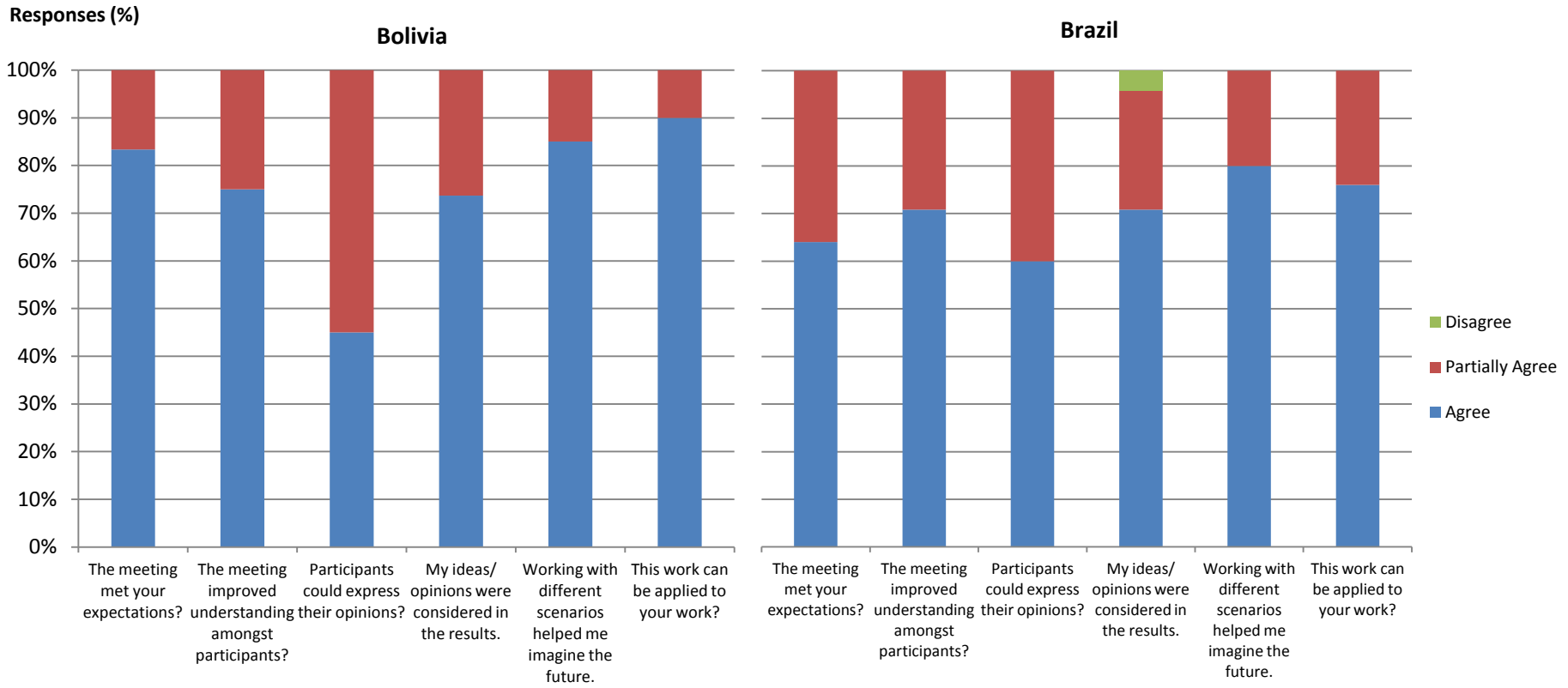


Figure 51. Stakeholder perceptions of the future scenario workshops.

In conclusion, the workshops were generally well received by the stakeholders and that in both Bolivia and Brazil they were widely regarded as being useful. There are clear issues in the process of choosing the scenarios, but it should be said that the scenarios eventually chosen in each country were satisfactory and that the development of scenarios is clearly seen as useful tool in policy development. In spite of some of the agreement levels (Figure 51) being relatively low for some of the questions, it should be put into context that only in one case did respondents declare that they wholly disagreed with any of the statements/ questions (and this only represented 4% of responses for that particular question) and therefore the workshops should be considered a success in terms of improving stakeholders understanding and the methodology used. However, similarly to the first workshops, the responses herein highlighted really do demonstrate the necessity for a skilled and motivated moderator/ facilitator to include all stakeholders in the process.

Further analysis of the questionnaire provided to the stakeholders, as well as an evaluation of the workshops by the co-ordinators/ facilitators with each country can be found in the Annex section of this document. For further analysis of the questionnaire, please see Annex 7.1.3 for Bolivia and 7.3.3 for Brazil and for the facilitator evaluation please see 7.1.2 for Bolivia and 7.3.2 for Brazil.

5. Summary and Conclusions

This report has presented the results of the first round of stakeholder meetings in the three case studies of ROBIN, Guarayos (Bolivia), Chamela-Cuitzmala (Mexico), and Flona Tapajós (Brazil) and also the results of the second stakeholder workshops in the case studies of Guarayos (Bolivia), and Tapajós (Brazil).

The first round of stakeholder workshops, devoted to the analysis of the current situation of the environment yielded interesting results concerning the most relevant aspects of the environment and the driving forces behind this situation. In all three case studies stakeholders identified deforestation as the most relevant environmental concern and highlighted the linkages between agricultural expansion and forest degradation. Moreover, all three case studies point at institutional and policy coordination as one of the key drivers of current environmental conditions. The dynamic analysis of the resulting maps shows how the described systems result in positive or negative consequences for the environment and social welfare. This can also illustrate the trade-offs that take place in the systems and how some ecosystem services such as agricultural production are produced at the expense of other services such as climate or water regulation provided by forests.

The analysis of the future in Guarayos and Tapajós provided comparable scenarios for the two case studies. The selected scenarios correspond to the ROBIN scenarios '*SSP1P - C3+BD+ES*' and '*SSP4 - C0*'. In the case of Guarayos these scenarios were re-named as '*Good life*' and '*Bad life*' respectively, whereas in the case of Tapajós they were called 'Desired' and 'Undesired' scenario respectively. The 'Good life' scenario in Guarayos shows a future situation in which law enforcement, sustainable management of forests, increased environmental awareness and increased technical capacity leads to a control of deforestation and conservation of biodiversity. On the contrary, the 'Bad life' scenario shows a future situation of social inequity and poverty, poor enforcement of laws and high deforestation rates. In the case of Brazil, the 'Desired' scenario describes a future in which the enhanced participation of the society in decision-making and management, higher social awareness, and improved institutional

settings would contribute to the compliance with the Forest Code, improved conservation of forests, improved quality of life, and higher income levels, especially for small communities and subsistence farmers. The 'Undesired' scenario is shaped by a productivist approach to the economy in the area, a lack of land use and tenure planning, uncoordinated and incoherent policies, and deforestation. However, it should be noted that stakeholders in the Tapajós case study process refused to develop the whole scenario and the FCM for the "Undesired" scenario, as this is a future situations they do not want to deal with.

The Bolivian case study of Guarayos was used to exemplify the methodological and analytical features of Fuzzy Cognitive Maps. As seen in section 3.1.3 FCMs can be used for the simulation of the effect of different drivers. In the example proposed, we tested the effects of the implementation of an agricultural policy (the INRA law) that gives access to land to indigenous communities and peasants. According to this simulation based on stakeholder views this law is a major trigger for deforestation and biodiversity loss in the area. The simulation of the effects of improved coordination of policy goals and institutions shows how an enhanced institutional and policy setting may importantly contribute to offset the negative environmental effects of the INRA law. Along these lines, the effect of other factors not taken into account in the maps can be considered and included in the analysis through the enrichment of the maps as shown in section 3.1.4. In this case, the fieldwork carried out in the province of Guarayos (Bolivia) contributed to enrich the map of the present to take into account the effect of the lack of access to credit, later validated by stakeholders.

The analysis of the participatory process after the first and second rounds of stakeholder workshops permitted for the evaluation of stakeholders' opinions on the development of the workshops, the methods selected and the results. A majority of participants (around 80% in the most negative case) considered that the workshops were useful for them. All stakeholders (100%) considered that the resulting FCMs of the present accurately reflected the current conditions in the represented case study sites. With respect to the main method used in the workshops, Fuzzy Cognitive Maps, in all three case study sites participants found that weighting relationships between factors was a difficult task. Among the least positive outcomes of the process it is remarkable that around 35% of the participants in each case study workshop considered that their opinions were not fully taken into account or that it was not easy to express them. This fact places a strong emphasis on the key role that experienced facilitators must play in guiding discussions and trying to motivate active participation of all attendants.

Finally, the results provided in this report will serve as a basis for the identification in the third stakeholder workshop of policy options and actions needed at the local scale for the conservation of biodiversity and the environment in a context of sustainable development (sustainable in socio-economic and environmental terms). In line with this, potential options to develop may include a more active involvement of society in planning and management decisions, a search for sustainable economic activities that may contribute to alleviate poverty, and improvements on environmental awareness, education and technical capacities.

6. References

Bonilla-Moheno, M. Aide, M.T. and Clark, M.L. (2012). The influence of socioeconomic, environmental, and demographic factors on municipality-scale land-cover change in Mexico. (2012). Regional Environmental Change. 12:543- 557.

Bottazzi, P. and Dao, H. (2013). On the road through the Bolivian Amazon: A multi-level land governance analysis of deforestation. Land Use Policy. 30:137- 146.

Bray, D.B. Ellis, E.A. Armijo-Canto, N. and Beck, C.T. (2004). The institutional drivers of sustainable landscapes: a case study of the 'Mayan Zone' in Quintana Roo, Mexico. Land Use Policy. 21:333- 346.

Fearnside, P.M. (2001). Land-Tenure Issues as Factors in Environmental Destruction in Brazilian Amazonia: The Case of Southern Pará. World Development. 29:1361- 1372.

Flamenco-Sandoval, A. Ramos, M.M. and Masera, O. R. (2007). Assessing implication of land-use and land-cover change dynamics for conservation of a highly diverse tropical rain forest. Biological Conservation. 138:131- 145.

Jones, L. and Kok, K. (2013). Scenarios for use in ROBIN. Deliverable D2.3.1, ROBIN project. European Commission.

Kok, K. (2009). The potential of Fuzzy Cognitive Maps for semi-quantitative scenario development, with an example from Brazil. Global Environmental Change 19. 122-133.

Macedo, M.N. DeFries, R.S. Morton, D.C. Stickler, C.M. Galford, G.L. and Shimabukuro, Y.E. (2012). Decoupling of deforestation and soy production in the southern Amazon during the late 2000s. PNAS. 109:1341- 1346.

Müller, R. Müller, D. Schierhorn, F. Gerold, G. and Pacheco, P. (2012). Proximate causes of deforestation in the Bolivian lowlands: an analysis of spatial dynamics. Regional Environmental Change. 12:445- 459.

O'Neill, B.C., Carter, T.R., Ebi, K.L., Edmonds, J., Hallegatte, S., Kemp-Benedict, E., Kriegler, E., Mearns, L., Moss, R., Riahi, K., van Ruijven, B., van Vuuren, D. (2012). Meeting Report of the Workshop on The Nature and Use of New Socioeconomic Pathways for Climate Change Research, Boulder, CO, November 2-4, 2011. Available at: http://www.isp.ucar.edu/socio-economic-pathways.

Özesmi, U., Özesmi, S.L.. (2004). Ecological models based on people's knowledge: a multi-step fuzzy cognitive mapping approach. Ecological Modelling, 176, 43–64

Pachecho, P. (2006). Agricultural expansion and deforestation in lowland Bolivia : the import substitution versus the structural adjustment model. Land Use Policy. 23:205- 225.

Paneque-Gálvez, J. Mas, J-F. Gùeze, M. Luz, A.C. Macía, M. J. Orta-Martínez, M. Pino, J. and Reyes-García, V. (2013). Land tenure and forest cover change. The case of southwestern Beni, Bolivian Amazon, 1986-2009. Applied Geography.43:113- 126.

Perez-Verdin, G. Kim, Y-S, Hospodarsky, D. and Tecle, A. (2009). Factors driving deforestation in common-pool resources in northern Mexico. Journal of Environmental Management. 90:331- 340.

Richards, P. D. Myers, R. J. Swinton, S.M. and Walker, R.T. (2012). Exchange rates, soybean supply response, and deforestation in South America. Global Environmental Change. 22:454- 462.

Schmook, B. and Vance, C. (2008). Agricultural Policy, Market Barriers, and Deforestation: The Case of Mexico's Southern Yucatán. World Development. 37:1015- 1025.

Varela-Ortega, C., Carmona, G., and Blanco, I. (2012). Workshop guidelines for ROBIN, Unpublished report, ROBIN project, July 2012.

Varela-Ortega, C., Kok, K., Blanco, I., Helfgott, A., Toledo, M., Clavijo, F., Lazos, E., Gerritsen, P., Martorano, L., Simoes, M., Ferreira, S., Juárez, E. (2013). A handbook to the participatory process in ROBIN: Development of methods for local stakeholder meetings. Deliverable D3.1.2, ROBIN project. European Commission.

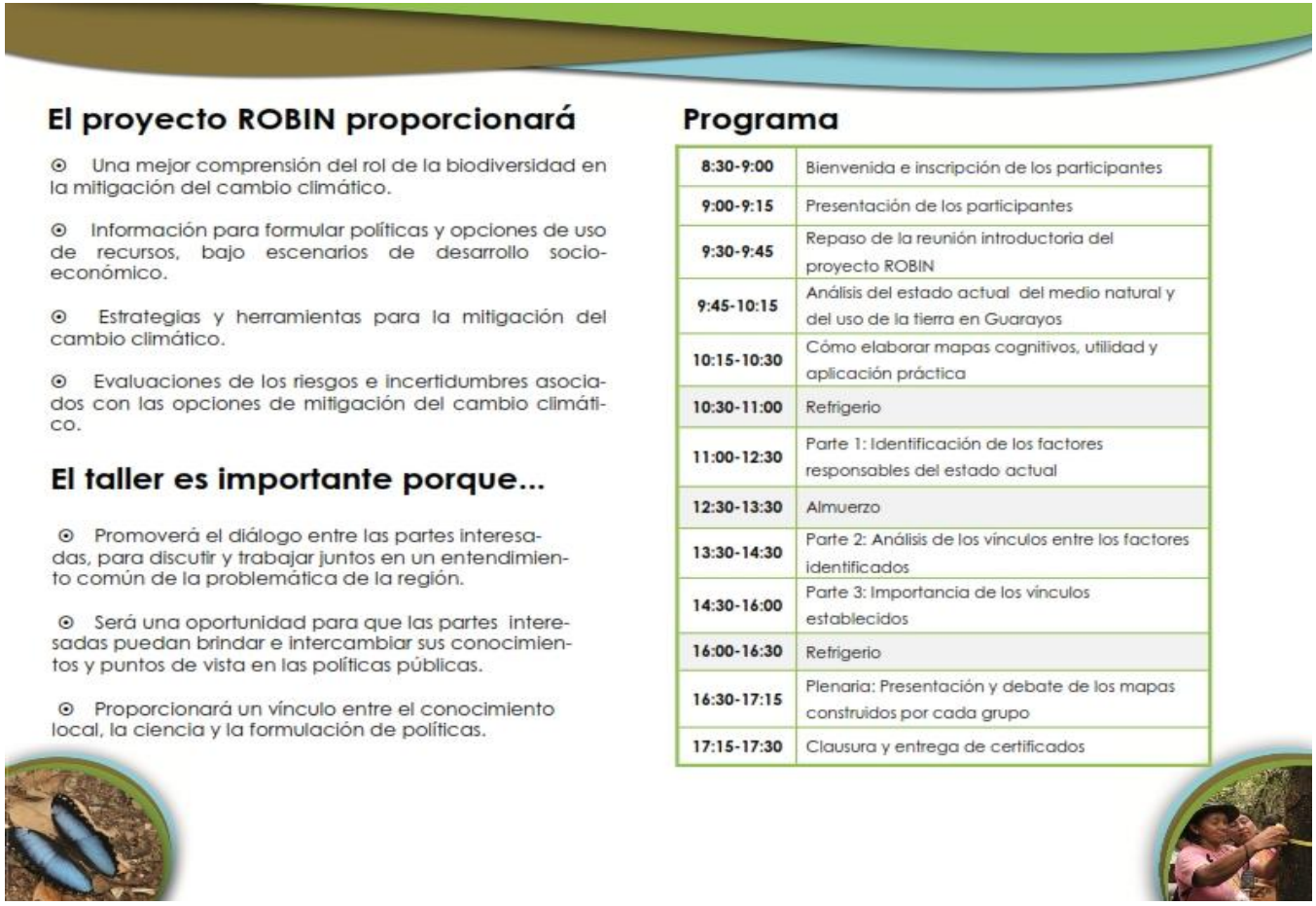
Verburg, R. Filho, S.R. Lindoso, D. Debortoli, N. Litre, G. and Bursztyn, M. (2014). The impact of commodity price and conservation policy scenarios on deforestation and agricultural land use in a frontier area within the Amazon. Land Use Policy. 37:14- 26.

7. Annexes

7.1 Complementary materials from the first and second stakeholder workshops in Ascensión de Guarayos, Bolivia.

7.1.1 Agendas of the Workshops

7.1.1.1 First Workshop



El proyecto ROBIN proporcionará

- Una mejor comprensión del rol de la biodiversidad en la mitigación del cambio climático.
- Información para formular políticas y opciones de uso de recursos, bajo escenarios de desarrollo socio-económico.
- Estrategias y herramientas para la mitigación del cambio climático.
- Evaluaciones de los riesgos e incertidumbres asociados con las opciones de mitigación del cambio climático.

El taller es importante porque...

- Promoverá el diálogo entre las partes interesadas, para discutir y trabajar juntos en un entendimiento común de la problemática de la región.
- Será una oportunidad para que las partes interesadas puedan brindar e intercambiar sus conocimientos y puntos de vista en las políticas públicas.
- Proporcionará un vínculo entre el conocimiento local, la ciencia y la formulación de políticas.

Programa

8:30-9:00	Bienvenida e inscripción de los participantes
9:00-9:15	Presentación de los participantes
9:30-9:45	Repaso de la reunión introductoria del proyecto ROBIN
9:45-10:15	Análisis del estado actual del medio natural y del uso de la tierra en Guarayos
10:15-10:30	Cómo elaborar mapas cognitivos, utilidad y aplicación práctica
10:30-11:00	Refrigerio
11:00-12:30	Parte 1: Identificación de los factores responsables del estado actual
12:30-13:30	Almuerzo
13:30-14:30	Parte 2: Análisis de los vínculos entre los factores identificados
14:30-16:00	Parte 3: Importancia de los vínculos establecidos
16:00-16:30	Refrigerio
16:30-17:15	Plenaria: Presentación y debate de los mapas construidos por cada grupo
17:15-17:30	Clausura y entrega de certificados

7.1.1.2 Second Workshop

El proyecto ROBIN propone

- Mejor comprensión del papel de la biodiversidad en la mitigación del cambio climático.
- Información para los formuladores de las políticas públicas para proveer estrategias sostenibles en Guarayos.
- Evaluación de los riesgos e incertidumbres asociados con las opciones para mitigar el cambio dimático.

La importancia del taller

- Promover el diálogo con las partes interesadas para discutir y trabajar juntos en un entendimiento común de los problemas de la región de Guarayos.
- Integrar conocimientos con las políticas públicas para fomentar la sostenibilidad presente y futura en la región.
- Mejorar la interacción entre el conocimiento local, socio-económico, científico y político.

PROGRAMA

8:30-9:00	Bienvenida e inscripción de los participantes.
9:00-9:15	Presentación del equipo IBIF y ROBIN Explicación del programa
9:15-9:30	Presentación de los participantes
9:30-10:00	Resultados de la primera reunión: El estado actual del uso de la tierra y del medio natural
10:00-10:15	¿Qué futuro nos espera? Experiencia en Brasil
10:15-10:30	Cómo elaborar escenarios utilizando mapas cognitivos
10:30-11:00	Refrigerio
11:00-12:00	Escenario 1: Lluvia de ideas. Identificación de los factores más influyentes en el estado futuro del medio natural.
12:00-13:00	Dinámica de grupo Escenario 1: Análisis e importancia de los vínculos que existen entre los factores identificados anteriormente.
13:00-14:00	Almuerzo
14:00-15:00	Escenario 2: Lluvia de ideas. Identificación de los factores más influyentes en el estado futuro del medio natural en Guarayos
15:00-16:00	Dinámica de grupo Escenario 2: Análisis e importancia de los vínculos que existen entre los factores identificados anteriormente
16:00-16:30	Refrigerio
16:30-17:00	Clausura de la reunión y entrega de certificados

7.1.2 Reports of the first and second Stakeholders Workshops

7.1.2.1 First Workshop

REPORT OF THE 1ST STAKEHOLDERS WORKSHOP
IN ASCENSIÓN DE GUARAYOS
WP 3.1 – ROBIN Project

Date of the meeting: 30th January 2013
Place of the meeting: Cultural center of Ascensión de Guarayos, Guarayos, Santa Cruz, Bolivia
Study Site: Ascensión de Guarayos Municipality
Reporter (name/institution): F. Clavijo and M. Toledo (IBIF)
(Based on the observers workshop reports and on the IBIF team perceptions and expertise)
Facilitator (name/institution): M. Toledo and F. Clavijo (IBIF), with the support of the experts I. Blanco and C. Varela (UPM)
Rapporteurs and observers (name/institution): L. Mercado and A. Ortiz (UAGRM)

Assistants (name/institution): A. Romero (UAGRM) and C. Borja (Across rent a car)

1.1. Were all stakeholders represented? Who was missing? Why?

The same stakeholders that participated in the preparatory meeting also attended the official meeting. The list of stakeholders was prepared with support from local people working in the region; consequently they represent the most important institutions involved in natural resources management.
In our opinion, an important stakeholder was missing: large-scale farmers such as the Mennonites were missing. In the case of the Mennonites, their absence is due to the fact that their culture does not permit to mixing with local people. However, two important stakeholders who was unable to attend the preparatory workshop, attended this time. They were representatives of Guarayos´ Cattlemen's Association (AGUAGUA) and a representative of Guarayos´ Timber Association.

1.2. Describe shortly how you invited participants. By letter, by phone, both? (Please include the invitation letter to this report) How did you identify the persons to be invited? Was it easy to get these people interested? Did they indicate their reason for participating/not participating? If so, what was the reason?

In this case, the invitation to the workshop was made by phone because at the end of preparatory meeting (in that occasion, we sent the invitation by letter) all participants agreed on a date for the realization of the official workshop. The phone call was a reminder of the date of the workshop and to confirm if they would attend.
As we indicated before, the persons invited were identified with the help of local people (Blas Pérez and Cosme García) who have worked in the region for many years, and know the most important institutions/stakeholders involved in natural resources management.
It was not difficult to get people interested to participating in the meeting, because most of them know what the problematic in the region is and they are aware of the need to find solutions. Besides, they said that they were interested in the training aspect of the event and also because the workshop will be useful for them and for the region.

1 DAY WORKSHOP

1. Representation of different stakeholders

Table 12. List of participants at first stakeholder workshop in Guarayos

Organisation	Position /affiliation	Gender	Participation in workshop (WS)
Organization Central of Guarayo Native People (COPNAG)	Member	M	Entire WS
	Member	F	Entire WS
Forestry Services	Consultant	M	Entire WS
Radio Mission	Secretary	F	Entire WS
Tropical and Agricultural Research Center (CIAT)	Technician	M	Entire WS
	Regional responsible	M	Entire WS
State Authority	Ranger	F	Entire WS

Organisation	Position /affiliation	Gender	Participation in workshop (WS)
Arado Foundation	Coordinattor	M	Entire WS
Arado Foundation	Facilitator	F	Entire WS
Farmers Federation	Secretary	M	Entire WS
Indigenous Forestry Association - San Juan	President	M	Entire WS
	Presidente	M	Entire WS
Indigenous Forestry Association - IRARAI	Member	M	Entire WS
	Member	F	Entire WS
	Member	M	Entire WS
	Member	F	Entire WS
	Member	F	Entire WS
	Legal Representative	F	Entire WS
Río Blanco y Río Negro (RByRB) Wildlife Reserve	Ranger	M	Entire WS
	Ranger	F	Entire WS
	Ranger	F	Entire WS
	Ranger	F	Entire WS
	Ranger	M	Entire WS
Indigenous Forestry Association - CURUBARÉ	Partner	F	Entire WS
Guarayos Timber Association (AMAGUA)	Manager	M	Entire WS
Authority and Social Control of Forest and Land (ABT)	Technician	M	Entire WS
Guarayas Indigenous Women Central (CEMIG)	Regional responsible	F	Entire WS
Development Area Program Guarayos (PDA)	Technician	M	Entire WS
Guarayo Cattlemen's Association (AGUAGUA)	Member	F	Entire WS
Central Inter Étnica de Ascensión (CIEA)	Member	F	Entire WS

2. *Atmosphere in the beginning*

2.1. Was a good atmosphere established?

2.2. Did you do something to encourage a good atmosphere?

In the beginning of the workshop all the participants received a flyer in Spanish explaining the objectives of the ROBIN project, the importance of the workshop, and the agenda of the workshop (Appendix 1). They also received sheets for taking notes and a pen.

As was the case with the preparatory meeting, the atmosphere established for the workshop was good from the beginning to the end, perhaps because the participants already knew each other and they also knew about ROBIN and what the meeting was about.

To ensure that participants were more confident and relaxed, we chose the same location used for the preparatory meeting (Cultural Center) and showed the same slideshow with images of nature and environmental music (nature sounds).

As attendees arrived, they were introduced to C. Varela (UPM) and we took this opportunity to talk to them about their expectations for the workshop.

3. *Discussion on the main issues related to the state of the natural environment in the Study Site*

Please send the outcome of the discussion

3.1. *What kind of discussions took place? Who supported, who criticised different views presented?*

What kind of reasons for support/criticism was presented? Whose input was decisive in that discussion? Whose was not?

To motivate the discussion about the state of the natural environment in the area, the facilitators M. Toledo and F. Clavijo started with a brainstorming session. The participants answered the following question: ¿What are the problems related to the natural environment in the area? The facilitators, using a flipchart, took note of all their input. It's important to note that previous to answering the question, the participants had a little discussion between them and then they expressed their opinion based on their institutional and personal experiences, including their collective knowledge. Some of them gave their responses about the problems that they perceive using statistical information, as was the case of the representative of Guarayos Timber Association (AMADGUA) who gave data of the National Institute of Statistics of Bolivia (INE), indicating that poverty could be also a problem related to the environment because according to the INE. In the 2002 census it was showed that Ascención de Guarayos is the poorest municipality of the department of Santa Cruz.

Most of interventions in the brainstorming session were made by the representatives of the AMADGUA, Arado Foundation, Río Blanco y Río Negro (RByRB) Wildlife Reserve, Tropical and Agricultural Research Center (CIAT), Farmers Federation, and Radio Mission. Other participants talked among themselves and seemed reluctant to say their opinions aloud. IRARAI representatives (an indigenous timber organization) remained silent throughout the process. It was necessary during the intervention for the facilitators to motivate and point out the opinions of different participants.

Overall the discussion was calm; however, at one point there was susceptibility by representatives of the Wildlife Reserve because the representative of Radio Mission indicated the existence of a big lack of control on hunting wildlife by the general population. This led to a discussion on the lack of resources for the rangers and the representative of the state authority emphasized the lack of cooperation of the local people and asked for assistance in reporting illegality by the general population.
Some ideas, during the brainstorming session are presented below:

-Deforestation - Pollution of rivers - Soil erosion - Loss of value to nature - Destruction of easements - Joints illegal - Fire - Exploitation of illegal mining - Air pollution - Illegal and indiscriminate exploitation of fish - Drain the pond heart - Hunting animals indiscriminately - Pollution from agrochemicals	- Extinction of animals - Misuse of soils - Poverty of people - Improper use and water management - Illegal land traffic - Lack of legal security - Modernization of agriculture - Lack of control by those responsible for enforcing the laws - Lack of knowledge of the laws - Migration without planning people - Lack of resources for the controllers - Lack of coordination between institutions - Lack of political

3.2. *Was there place for experience-based knowledge as well as for scientific knowledge?*

Most of the comments from the participants were made based on personal and professional experience; for example, some of them associate the lack of rainfall in the region with deforestation. They believe that this happens because many trees have been cut which serves to regulate rainfall.

3.3. *Were there diverging views on the past changes? Fill in the following table.*

Tick here	*Please choose <u>one</u> of the following assertions that in your opinion describe the degree of **divergence of views.** Please read all options before choosing one.*
	There wasn't any divergence at all.
x	There was very little divergence.
	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the issues and discussing about them required a lot of time.
	None of the above. Better description is:

4. *Mapping main issues* (*card technique*)

4.1. *What issues did different stakeholders identify? Did you ask them to identify 'problems', or more neutrally just 'issues'*?

According to the number of people who attended the workshop, it was decided to divide the participants into two groups. Each group had the support of a facilitator and an expert of methodology as well as an observer and rapporteur. The groups were divided evenly, trying to have at least one representative of each institution involved in each group.

There was no talk about problems or issues, but rather of drivers or factors and as in the brainstorming session, the participants answered the follow question: ¿What are the factors that, in your view, have influenced the natural environment as it is today?

They were given two cards each to answer the question. They had a moment to think before determining and write on cards the drivers or factors they considered most important.

For participants in the first group it was very simple to recognize these factors and their answers were based largely on their knowledge and views as representatives of different institutions.

The drivers that most participants highlighted, in the first group, were: poverty, lack of awareness of the environmental problem, deforestation indiscriminate, lack of enforcement of laws, lack of planning, uncoordinated organic, mechanized agriculture, land traffic, enslavement of land, river pollution, use of agrochemicals, failure to comply with the limitation of land use, lack of zoning, destruction of natural grasslands, forest fires, illegal clearing, illegal mining exploitation, trash, lack of coordination between institutions, illegal animal trafficking, pollution, and view of nature as mercantilism. Other factors that emerged during the discussion were: expansion of agriculture, expansion of livestock, illegal harvesting of timber and bad enforcement of the general forest management plans.

In some cases it was necessary clarify certain factors:

- Poverty: considering the lack of income sources that make people commit crimes like illegal deforestation or agriculture and using agrochemicals cheaper that damage the earth even more.
- Coordination of institutions: lack of coordination and policies between institutions related to the environment.
- Land trafficking: Specifically to local people who negotiate land illegally with foreign people like Mennonites. It was explained how people buy land illegally and negotiate communal lands without permission of the community.
- Use of agrochemicals: referring that before everything worked manually and now it used airplanes to watered agrochemicals without thinking in the air, trees or wildlife around.
- Compliance with the limitation of land use: referring to the lack of respect of the land boundaries by some people.
- Lack of zoning: referring to the lack of awareness of the people about the land use plan.
- Destruction of natural grasslands: referring that many years ago had many natural grasslands have been destroyed because people did not know their value, as they are water reservoirs.

- Illegal exploitation mining: referring to that had many Russians and Brazilians who committed these crimes in Guarayos.
- Forest fires: referring to the lack of control of the fire by farmers.
- Illegal traffic of animals: considering the trade of wildlife by tourists, a common activity in Guarayos.

Finally, after the discussions between the participants and grouped the cards with the same concept 24 drivers were identified that have influenced the natural environment as it is today.
The same methodology was used in the second group who determined and wrote their drivers in the cards. During the time given to them to think about the factors, some of them exchanged information in their own language (Guarayo).
The drivers that most participants highlighted, in the second group were: deforestation, soil erosion, land traffic, forest fires, migration, lack of respect for nature, lack of knowledge of the laws, pollution, poor land use, poaching, encroachment in protected areas, lack of training of rangers, air pollution from forest fires, indiscriminate hunting and fishing.
As in the first group, it was necessary clarify certain factors. By example, the representative of farmer's federation felt the necessity to explain the difference in meaning between illegal slash (using burning) and illegal clearing (using machinery) in order for these to be considered as different factors. He also explained his contribution of "lack of respect for nature" highlighting the attitude of those who damage the environment in order to exploit the resources and take only advantage from them.
In turn, the rangers, from their experience, had selected as a factor "the river's pollution", arguing that now fishermen used poison as a fishing method just to take the fishes more easily.
Finally, after the discussions, 18 factors or drivers were identified that influenced the natural environment as it is today.

4.2. *What were the reactions to presented issues*?

Both groups reacted with surprise as the factors were presented. However they were satisfied with the results because these factors reflect Guarayo's reality nowadays. As they had already discussed about which should be the most important factors, they focused on continuing with the validation of the factors, linking and giving weights to each one. After validating and giving weights to each card, the most important factor in each group was deforestation, in the first group and forest clearing in the second group.

Who supported, who criticized different views presented?
What kind of reasons for support/criticism was presented?

In the group 1 the participants with more interventions and influence with the rest of the group were representatives of ABT, Arado Foundation, CIAT, and State Authority.
One of the moments in the workshop during the explanation of the factors, there was a little discussion to understand better the issues with the Bolivian laws. The Arado Foundation's representative intervened to criticize forestry standards. For his part, the Forest Service (ABT) representative replied explaining that the Forestry law classifies as tax fraud illegal deforestation but forest fires can bring jail time. He further explained that the laws are just copies of other foreign laws and with the new forest law this will

be regulated and modified. Then, he believes that it is very necessary to amend the 1700 Forest law, because it contradicts the INRA (National Agrarian Reform Institute) law. His diagnosis was supported by the Arado Foundation's representative.
For her part, the representative of State Authority said that agricultural production has lowered in Guarayos with the rise in forest management activities and communities were no longer investing much in subsistence farming. She recalled that in the past the Guarayos grew their own crops but most communities had switched to forest management activities. The income generated is enough to allow communities to purchase food imported from outside of the Guarayos region. Some of the participants supported this fact, indicating that lack promote agricultural production in the area.
However, the representative of the ABT indicated that the problem was not the forest management plan itself but financial mismanagement by the community members themselves. Everyone nodded to what this representative said, but several people mentioned that it was an internal problem because local people are the ones who create inequality in Guarayos. Everyone recognized that the forest management activities protect the environment and the forests and is responsible for higher incomes and jobs and that mismanagement by community stakeholders themselves was the root cause for social and economic inequality within the communities.
In group 2 the participants with more interventions and influence on the rest of the group were representatives of the Farmers Federation and Arado Foundation as contributing with ideas and talking with the other seeking their approval.
Participants with fewer inputs were the representatives of CIEA, COPNAG and IRARAI. The Río Blanco y Río Negro (RByRB) Wildlife Reserve representatives provided their opinion focused primarily on protecting wildlife areas. On the other hand, the AGUAGUA's representative, expressed her opinion a few times, but mostly supported the contributions of others.
Related to the factor of lack of knowledge of the laws, there was a discussion between AGAGUA representative and the Farmer's Federation. The representative of AGUAGUA argued that producers know the laws but they don't want to comply, so the representative of the Farmer's Federation refuted indicating the condition of small farmers' lack of technology and lack of knowledge of many laws.

4.3. *Were there diverging views on the main issues discussed in this workshop*?

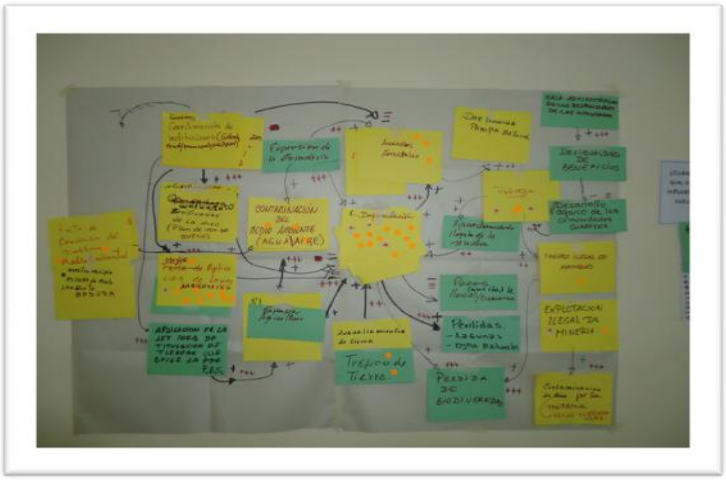
Tick here	Please choose one of the following assertions that in your opinion describe the degree of divergence on views of the main issues. Please read all options before choosing one.
	There wasn't any divergence at all.
x	There was very little divergence.
	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the main problems and discussing about them required a lot of time.
	None of the above. Better description is:

4.4. *Did you find the presented issues surprising? Why, why not?* (*Relate to the discussion and results of the preparatory workshop*)

In terms of results, we believe there was surprising clarity in the all the participants about the main problems in the region. They were firm in their opinions and it was obvious that they had much knowledge of both the region and the problems. The results are reflected in the maps.

4.5. *How were the identified problems linked/clustered together? Please send the material*

The participants were divided in two groups; each group had a mixture of stakeholders. Explanations about the methodology were done by the organizers and two of them were in each group. Below the photos illustrating the results of the participatory process for obtaining the Fuzzi Cognitive maps.



Fuzzy cognitive map of group 1.

Fuzzy cognitive map of group 2.

Who got to decide about the linkages?

According to the experts in the methodology (C. Varela and I. Blanco) each participant who placed his factor on the cards should make links with other factors. This was backed by the rest of the group and supported by facilitators.

Whose input was decisive in that discussion?

In the first group, most convincing were the representatives of the ABT and Arado Foundation since both were influential in the support they gave to different ideas and opinions, it may be that the two spoke with legal and practical knowledge of the situation. In the second group most convincing were the representatives of Farmers Federation and Arado Foundation.

Which issues were left alone?

We think some socio economical aspects were missed because most of the factors were based more on environmental aspects. An important element that was discussed was the presence of the Mennonites and how they contribute to the problems in the region. However, their participation was not possible in the workshop.

***4.6. Were any unexpected linkages between different issues formed*?**

No, because all of factors were related.

4.7. Methodological aspects of card technique

Was it easy to name the issues by each participant?

Sometimes it was not easy because some of participants had difficulty in expressing clearly their ideas. In this moment, the role of the facilitator and the expert was very important because they helped them to clarify more their ideas.

Was it easy/hard to find clusters of the issues?

It was easier; because the most critical time was during the definition of the factors and most of these factors had a close relationship with each other.

Did new issues arise while clustering?

Yes, it was given to them cards with different colors to put new factors.

The new factors found were: Expansion of agriculture, traffic land, expansion of livestock, illegal harvesting of timber, improved implementation of the General Forest Management Plans.

5. Spidergrams: Spidergrams do not have to be designed during the meeting; they can be developed after the meeting by the research team according to the factors chosen by the different SH.

5.1) What were the differences/similarities in the ways in which different stakeholders weighted the main problems?

5.2) Methodological aspects of Spidergrams

Was it easy to draw spidergrams and give weight to different problems?

Did it offer any help in learning about the problem and interlinkages of relevant factors?

6. FCMs of the present: Please include pictures of the FCMs.

6.1) How did you organise the FCM session? In different groups? How many?

What were the criteria to group people? Please give a list of participants to different groups and name or number of the group.

According to the experts, first the participants were dived in two groups.

Each group consisted of about 13 people. They tried to have a balanced number of men and women in each group, in addition to one representative from each institution.

Most of the participants respected the group touched, except for some participants that at some point went to another group.

The groups were conformed to the following participants:

Group 1	**Group 2**
Institution	**Institution**
Radio Mission	Central Organization of Guarayo Native People (COPNAG)
Arado Foundation	Forestry Services
Central Organization of Guarayo Native People (COPNAG)	Tropical and Agricultural Research Center (CIAT)
Indigenous Forestry Association - San Juan	Arado Foundation
Tropical and Agricultural Research Center (CIAT)	Farmers Federation
Río Blanco y Río Negro (RByRB) Wildlife Reserve	Indigenous Forestry Association - IRARAI
State authority	Indigenous Forestry Association - IRARAI
Río Blanco y Río Negro (RByRB) Wildlife Reserve	Indigenous Forestry Association - IRARAI
Indigenous Forestry Association - IRARAI	Central Inter Étnica de Ascensión (CIEA)
Indigenous Forestry Association - IRARAI	Río Blanco y Río Negro (RByRB) Wildlife Reserve
Indigenous Forestry Association - CURUBARÉ	Río Blanco y Río Negro (RByRB) Wildlife Reserve
Guarayos Timber Association (AMAGUA)	Río Blanco y Río Negro (RByRB) Wildlife Reserve
Guarayas Indigenous Women Central (CEMIG)	Guarayo Cattlemen's Association (AGUAGUA)
Authority and Social Control of Forest and Land (ABT)	
Indigenous Forestry Association - San Juan	
Development Area Program Guarayos (PDA)	
Río Blanco y Río Negro (RByRB) Wildlife Reserve	

6.2) What kind of discussions took place in the groups? Who supported, who criticized different views presented? What kind of reasons for support/criticism was presented?

Who got to decide about the linkages and their weights? Whose input was decisive in that discussion? Whose was not?

These questions were answered before.

6.3) Were there diverging views on the FCMs produced in the groups? Fill in the following table(s).

Group 1

Tick here	Please choose one of the following assertions that in your opinion describes the degree of divergence of views in the group. Please read all options before choosing one.
	There wasn't any divergence at all.
x	There was very little divergence.
	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the issues and discussing about them required a lot of time.
	None of the above. Better description is:

Group 2

Tick here	Please choose one of the following assertions that in your opinion describes the degree of divergence of views in the group. Please read all options before choosing one.
	There wasn't any divergence at all.
x	There was very little divergence.
	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the issues and discussing about them required a lot of time.
	None of the above. Better description is:

6.4) What kind of knowledge were people bringing into the exercise? (any references to science; references to own experience in the field; references to the history of the region; etc.)

This question was answered before.

6.5) Any signs in cognitive learning detected? Learning new things about the pilot site or the region? Give examples.

6.6) Any signs of social learning detected? Learning from each other? Give examples.
Learning as a result of discussions/debates with each other? Give examples.
Was common understanding of the problem detectable? Give examples.
6.7) How do the different FCM's relate to one another? Similar, different?
6.8) What was the relationship between the identified issues and the final FCMs?
Which issues of the original ones were included? Which were omitted?
6.9) Methodological aspects. Was the use of FCM easy/hard for the participants?
It was easy, because the expert and facilitator clearly explained the methodology of the FCM so they could answer the questions and decide clearly the factors as well.
Was the FCM helpful in stimulating system thinking (cognitive learning) and social learning (between different participants)?
Yes, because they shared experiences and knowledge to each other during the process of the FCM.
How were different kinds of knowledge handled during the process? (Different knowledge like science, practical knowledge, experience, etc.)
6.10) What kind of comments did the participants have? Who/what?
They felt that the FCM served to them to understand better the factors that have influenced the natural environment as it is today. They were satisfied with the results and they gave good comments about the methodology and the discussions.

7. End of the day thoughts:
7.1) Who was most loud/ outspoken?
Most of them participated actively; however, some of them participated more like the representatives of AMAGUA (Salvador Vaca Añez), ABT (Adalid Quispe), State Authority (Rita Oreyaí), Arado Foundation (Marcelo Rocha), Farmers Federation (Ascencio Lavadenz), and Río Blanco y Río Negro (RByRB) Wildlife Reserve (Concepción O.).
7.2) Who had the most convincing arguments ('convincing' meaning s/he could convince others, not necessary convincing in your opinion). Based on what knowledge, based on which arguments?
As we described before, the participants with more interventions and influence with the rest of the group were representatives of ABT, Arado Foundation, CIAT, and State Authority, Farmers Federation and Arado Foundation as contributing with ideas and talking with the other seeking their approval.
7.3) Who was not influencing?
Participants with fewer contributions were CIEA (Ester), COPNAG (Teresita), and representatives of IRARAI.
7.4) Was different participants' input as expected? Did participants present any unexpected comments? Were the most resourceful/influential/dominant participants the ones you expected? Did someone become unexpectedly influential?
We can say that almost of the participants completed all expectations for the workshop. Since the beginning, the idea was to have in the workshop, people who knew well about the area and were closely linked with population's problems. It is clear that some participants, that we expected much involvement or influence, surprised us in all its interventions such as representatives of Arado Foundation, Farmers Foundation, and ABT.

7.5) How much did the 'experts' intervene? How much were they asked for help? (Experts like ROBIN people or other recognized as experts)

Just in some cases, when the participants couldn't explain very well their ideas or were confused with the methodology. In some moments, it was necessary to intervene to motivate the participants to speak.

8. General observation of the whole workshop

Your own impressions:

8.1) Do you think it went well?

8.2) Did it go how you had expected?

8.3) What went as according to your expectations?

8.4) What went contrary to your expectations?

8.5) What is your general feeling of how the workshop was designed/structured/carried out?

In general, we believe that the workshop was successful and fulfilled our expectations. All those invited attended and contributed their knowledge in the preparation of the maps. They discussed the most important factors and we could see clearly the problem in the area. All were very identified with the work done making the cognitive map, as well as committed to the search for possible solutions to the problems encountered.

9. Participant satisfaction

9.1) How do you think participants felt about the workshop?

9.2) Atmosphere

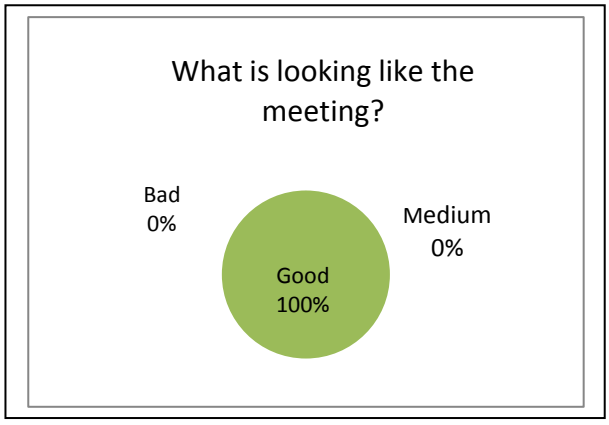
Report mood-o-meter results. Was general atmosphere throughout meeting constant, or did it change a lot? In general, would you say it was enthusiastic/neutral/reluctant?

In general, participants enjoyed the workshop; this can be seen in the "mood-o-meter" results.

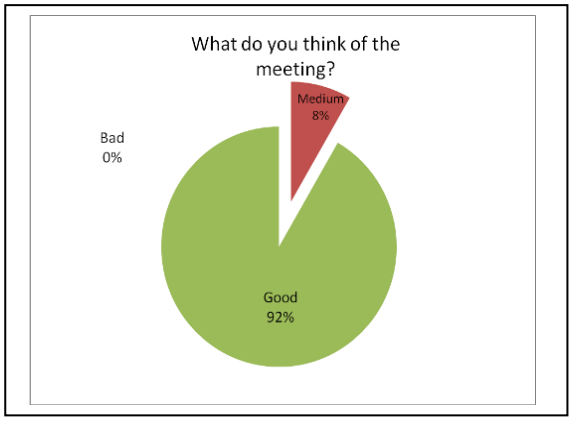
However, there were moments of greater participation and other no, such as in brainstorming and identification of factors, where participants were more animated and involved. Sometimes, when participants felt fatigue, as well as at the end of the brainstorming and the links to the factors, we took the initiative to carry out two dynamics (Appendix 2) to increase the motivation and energy of the workshop.

Mood-o-meter results

1st mood-o-meter



2nd mood-o-meter



9.3) Methodological aspects

How did you carry out the mood-o-meter exercise?

Did it work? Any suggestions for improving the technique? How would you do it differently in the future?

We used the mood-o-meter twice, one in the half of the workshop and the other at the end. This technique helped us to see if the participants were happy with the workshop and probably would help us to change the strategy if the results were no good.

In our opinion, it is a good method to measure if people continued being interested. Additionally, it was time efficient, because it required a few minutes to mark one of the faces, according to your mood.

10. General observation during the workshop

10.1) Did discussion flow well and naturally, or was facilitation and motivation required much of the time?

10.2) In general, do you feel participants voiced their true opinion/viewpoints?

10.3) Were they given enough opportunity to voice their true opinion/viewpoint?

10.4) Did participants listen to each other well?

Most of the time, the flow of the discussion was very good. However, at times, the facilitators and the experts tried to motivate the participants to speak more and participate without complications, because it was important to get as much information and opinions to validate the Maps.

11. General observation during breaks

11.1) Any clear 'groups' formed?

11.2) Who was talking with whom?

During the break, some participants dispersed, some silent and others talked to each other, especially those related group (ARARAI, CIAT, AMADGUA and DIAP). Some participants (CIAT, SFA, AGUAGUA and Radio Mission) stayed in the room for a moment so that the experts will discuss and explain the experiences of the workshops held in Europe. It was noted that participants were pooled, talking about work related issues or others outside the workshop. Several participants took the opportunity to talk to the facilitators.

During the lunch, the participants dispersed more than the break, but the same groups talked among themselves. However, it was observed the conversations between the representatives of AGUAGUA, Arado Foundation and Farmer's Federation, who stayed a moment on the table for discussion.

12. Feedback

12.1) Apart from the feedback questionnaire (sent and processed separately from this report), what kind of feedback did the participants give?

We tried to know their findings about the workshop during the break and lunch and they were very receptive telling that they were satisfied with the workshop and what learned there (Appendix 3)

13. Any final thoughts?

13.1) What could you suggest for improving the workshop in the future? (Anything at all!)

13.2) Anything in particular you would add/remove/change?

13.3) What about the process of observing/recording/reporting/interviewing/doing questionnaires?

13.4) Any other comments/thoughts?

In general, we believe that the methodology and workshops were an excellent way to better understand the reality of Guarayos. The participatory approach created a space in which local actors could meet and discuss the problematic that affects their region and to possibly create synergies between them. Particularly, I think it would be interesting to develop more specific dynamics, to make participants better understand end objective of the cognitive maps.

It is important to note that during the workshop, a land use map was discussed of the region conducted by the GFCF (through GIS) and validated by the participants. Their answers are included in the feedback survey (Appendix 3).

Furthermore, at the end of the workshop, we proceeded to give them each a certificate of participation, in order to motivate them to participate in the following workshops for future cognitive maps (Appendix 4).

Flyer in Spanish for the participants. It explains what ROBIN will provide, the reasons why the workshop was important and the agenda of the workshop.

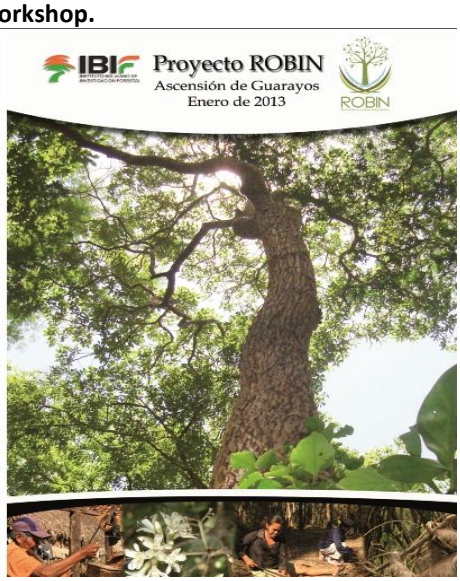
Contacto

Para mayor información puede visitar la web:
http://robinproject.info/esp/

En Bolivia dirigirse a:
Instituto Boliviano de Investigación Forestal
Telf. 3411171
comunicacion@ibifbolivia.org.bo

ROBIN es financiado por el Séptimo Programa Marco de la Unión Europea (TEMA ENV.2011.2.1.4-1 - Potencial de la biodiversidad y los ecosistemas para la mitigación del cambio climático) Acuerdo de apoyo financiero No: 282093.

Instituciones afiliadas al proyecto ROBIN



El proyecto ROBIN proporcionará

- Una mejor comprensión del rol de la biodiversidad en la mitigación del cambio climático.
- Información para formular políticas y opciones de uso de recursos, bajo escenarios de desarrollo socio-económico.
- Estrategias y herramientas para la mitigación del cambio climático.
- Evaluaciones de los riesgos e incertidumbres asociados con las opciones de mitigación del cambio climático.

El taller es importante porque...

- Promoverá el diálogo entre las partes interesadas, para discutir y trabajar juntos en un entendimiento común de la problemática de la región.
- Será una oportunidad para que las partes interesadas puedan brindar e intercambiar sus conocimientos y puntos de vista en las políticas públicas.
- Proporcionará un vínculo entre el conocimiento local, la ciencia y la formulación de políticas.

Programa

8:30-9:00	Bienvenida e inscripción de los participantes
9:00-9:15	Presentación de los participantes
9:30-9:45	Repaso de la reunión introductoria del proyecto ROBIN
9:45-10:15	Análisis del estado actual del medio natural y del uso de la tierra en Guarayos
10:15-10:30	Cómo elaborar mapas cognitivos, utilidad y aplicación práctica
10:30-11:00	Refrigerio
11:00-12:30	Parte 1: Identificación de los factores responsables del estado actual
12:30-13:30	Almuerzo
13:30-14:30	Parte 2: Análisis de los vínculos entre los factores identificados
14:30-16:00	Parte 3: Importancia de los vínculos establecidos
16:00-16:30	Refrigerio
16:30-17:15	Plenaria: Presentación y debate de los mapas construidos por cada grupo
17:15-17:30	Clausura y entrega de certificados

Certificate of participation for the participants.

ROBIN

Otorga el presente:

CERTIFICADO

a: _____

Por su asistencia al *Primer Taller Participativo del Proyecto ROBIN*, llevado a cabo los días 23 y 30 de enero de 2013, en Ascensión de Guarayos, provincia Guarayos, Santa Cruz, Bolivia.

Consuelo Varela -Ortega
Universidad Politécnica de Madrid

Marisol Toledo
Instituto Boliviano de Investigación Forestal

7.1.3 Second Workshop

REPORT OF THE 2ND STAKEHOLDER WORKSHOP IN GUARAYOS, BOLIVIA

Date of the meeting: 18 de junio de 2014

Place of the meeting: Ascension de Guarayos, Casa de la cultura.
Area of study:

Reporter (name/institution): Alejandra Romero Seas, IBIF
Telma Padilla, UAGRM

(Based on the observers workshop reports and on the IBIF/UPM team perceptions and expertise)

Facilitator (name/institution): Irene Blanco-Gutierrez UPM.
Marisol Toledo, IBIF.
Support Staff: Sandra Velasco, IBIF
Carmelo Borja, Across rent-car

1. Representation of different stakeholders

Table 13. List of participants at second stakeholder workshop in Guarayos

Organisation/ profession	**Position /affiliation**	**Gender (M/F)**	**Age**	**Participation in workshop** (entire workshop/Only in sessions x,y,z)	**Did attend the preparatory meeting** (January 23, 2013)?	**Did attend the 1st SHW** (January 30, 2013)?	**Did apply the information obtained from the preparatory and 1st SHW in their own work?**
Direna G.D.A.S.C.	Resp. Gestión Forestal	M		Only in the morning	yes	yes	N/A
Direna G.D.A.S.C.		F		Entire workshop	No	No	No
DIAP		F		Entire workshop	Yes	Yes	Yes
DIAP		F		Entire workshop	Yes	Yes	Yes
Curuvare		M		Entire workshop	No	No	No
CEMIG		F		Entire workshop	No	No	no
Sub-gobernacion Guarayos	Ing. Forestal	M		Entire workshop	Yes	Yes	N/A
Radio Las Misiones		F		Only in the morning	No	Yes	Yes
G.A.M.A.S.C. Guarayos		M		Entire workshop	No	No	No
COPNAG	Presidente	M		Entire workshop	no	no	no
Irarai	Representante legal	F		Only in the morning	Yes	Yes	Yes
Irarai		M		Only in the morning	No	No	No
DIRENA	Técnico Gestión Forestal	M		Entire workshop	Yes	Yes	N/A
COPNAG		F		Entire workshop	No	No	No
COPNAG		M		Entire workshop	No	No	No
DIAP-G.P.A.R.N.		M		Entire workshop	yes	yes	yes
DIAP		M		Entire workshop	Yes	Yes	N/A

Organisation/ profession	**Position /affiliation**	**Gender (M/F)**	**Age**	**Participation in workshop** (entire workshop/Only in sessions x,y,z)	**Did attend the preparatory meeting** (January 23, 2013)?	**Did attend the 1st SHW** (January 30, 2013)?	**Did apply the information obtained from the preparatory and 1st SHW in their own work?**
Irarai		M		Only in the afternoon	no	no	no
San Juan		M		Entire workshop	no	no	no
SEDACRUZ	Extensionista agropecuario	M		Only in the afternoon	no	no	no
COPNAG		M		Entire workshop	yes	yes	yes
APROKAW		M		Only in the afternoon	no	no	no
APROKAW		M		Entire workshop	no	no	no
APROKAW		M		Entire workshop	No	no	no
AFI San Juan		M		Entire workshop	no	no	no
C.C.S.P.	Presidente	M		Only in the afternoon	no	no	no
C.E.C.U.		M		Entire workshop	no	no	no
AFI Salvatierra		M		Only in the morning	no	no	no
CENCOS- Salvatierra		M		Only in the morning	no	no	no
COPNAG		M		Only in the afternoon	no	no	no
COPNAG		M		Only in the afternoo	No	No	No
Central CESI-Yaguaru		F		Only in the afternoon	No	No	No
Radio Guaguazuti	Comunicador	M		Only in the afternoon	No	No	No
Radio Guaguazuti	Comunicador	M		Only in the afternoon	No	No	No
CECU-Urubichá		M		Only in the afternoon	No	No	No
COPNAG		M		Only in the afternoon	No	No	No

1.1) Were all stakeholders represented? Who was missing? Why?

Unfortunately, some people from important institutions (ABT, CIAT, Fundación Arado, Federación de campesinos, AMAGUA-Asociación de madereros, AGAGUA – Asociación de ganaderos) did not assist to the event. They justified their absence due to other previously scheduled meetings.

1.2) Were there new participants compared to the first workshop? Why? How the workshop was 'sold' to new participants? What made them to attend?

All the attendees to the initial workshop were invited. Additionally, there were participants that were not directly invited and were sent through instructions from their main institutions. These participants were mainly indigenous groups from CECU, CENCOS and CESY sent by the indigenous governing body COPNAG. Others that participated without a direct invitation learned of the workshop through word of mouth and requested inclusion in the event. These came mostly from SEDACRUZ, APROKAW and the regional governor's office.

The new participants received a pre-workshop orientation to familiarize them with the work conducted during the first workshop. The enthusiasm expressed facilitated the quick learning process required for their effective participation in the second workshop.

1.3) Was it easy to get these (old and new) people interested? 'Old' is meaning, of course, a participant that was also in the first workshop.

There seemed to be more enthusiasm and interest from the new participant compared to those who also participated in the first workshop. However, the workshop flow was relatively smooth because of the high interest in the results of the ROBIN stakeholder component and because the initial presentation included many photographs from the first workshop.

1.4) Describe shortly how you invited participants. By letter, by phone, both? (Please include the invitation letter to this report)

Participants were invited through a formal invitation that was hand-delivered to their respective institutions. Participants from indigenous communities had their invitations hand-delivered to their homes. All participants were invited to the workshop with a week´s notice and the same day of the event received a reminder phone call.

2. Atmosphere in the beginning

2.1) Was a good atmosphere established?

Yes, there was much laughter and good communication between the participants. We also observed good interactions during the breaks and lunch. Interpersonal interaction is extremely important for the success of these types of workshops especially with indigenous communities.

2.2) Did you do something to encourage a good atmosphere?

The good atmosphere was encouraged through the presence of people and facilitators (IBIF) that were well-known in the community and also due to the high interest that the researcher from Spain elicited. Presenting the maps that were

developed during the first workshop highlighted the initial results and gave a sense of connectivity and continuance to the activities of the stakeholder component. The presentation of photographs and video of fauna and flora from Guarayos as an introduction to the workshop also helped to capture the attention of the participants. The facilitators presented themselves and welcomed the participants helping to warm the atmosphere between participants prior to initiating the workshop.

3. Presenting the results from the first workshop

3.1) How were the results of the first workshop presented?

Presentation of the results from the first workshop was carried out through the use of a powerpoint presentation along with a printed map (90x120 cm) and printed letter-sized maps in color which were handed out to each participant. Results presented included the working group results from the first workshop (Group 1 and 2; present day scenario), the combined Fuzzy Cognitive mapping, and an analysis of the impact of the application of the land tenure laws on land tenure rights in Guarayos. Additionally, the continuity of the participative process of the project was highlighted by the presence of the team researcher (preparatory workshop, first workshop, and field visit) in the Guarayos region.

3.2) What was the reaction by the stakeholders?

Some of the participants were late in attending the workshop so it was a little difficult to have everyone´s attention initially. However, the reaction by the great majority of participating stakeholders was very positive during the presentation. Participants from indigenous communities showed more interest than other groups from the regional governor´s office and seemed to buy in more to the results that were shown.

What kind of comments?

At the end of the workshop, the president of the indigenous organization for Guarayos, COPNAG, thanked the researchers for the work in analyzing the results from the ROBIN workshops and indicated that they reflected the present day situation in the Guarayos region. He also indicated that the results shown help in the internal reflexion that indigenous communities and all participants need to conduct to look for solutions to the region´s complex problems.

Were there a lot of knowledgeable comments and suggestions about the FCMs from the participants?

There were no comments regarding the FCMs from the participants.

Was there confusion about the method?

THere was no confusion regarding the methods. The results from the analysis of the combined maps generated more commentary than the results of the map itself.

Were there different reactions by the old and new participants? What was the difference, if any?

The new participants were initially confused with the processes and analyses utilized to achieve the presented results. Additionally, there were expectations regarding the outcome of the workshop with a few participants expecting solutions to the regional issues identified. However, the facilitators were able to

highlight the importance of identifying, understanding and analyzing the local perceptions by multiple users related to environmental issues in Guarayos. Once the problems and underlying causes are identified and understood; then solutions can be proposed.

3.3) Discussions on the final FCM of the present:

Were people satisfied with the final FCM? What comments they gave?

The map generated by the first workshop was validated during this second workshop. There were some additional comments made mostly by the new participants regarding some of the factors and weights given referring specifically to mining, lack of technical capacity of local professionals, lack of knowledge of environmental and forestry norms and laws, lack of information regarding environmental and forestry laws by the government authorities (state government and forest service), and lack of coordination between different government institutions. But the facilitators showed that those factors were in the combined map already. One of the participant mentioned that she understood the map and was easy to understand as she participated in the first meeting.

Did people accept the idea that only one final FCM is produced?

Yes, the participants accepted the idea that only one final FCM was produced.

Were new 'boxes' or linkages/weights between the 'boxes' suggested? If so, why?

There were no changes to the boxes or weights between boxes. However, there were discussions on the weights given to the land titling law, the forest law, and cattle ranching.

What of the suggested changes were incorporated to the FCM, if any?

There was a change in weight for mining from 03 to 05.

Discussions between the participants: Did they try to help others to understand the final FCM, if there were such difficulties?

Some participants were very open in discussing the issues; specifically the laws concerning land titling, forest use, and mining. There was also discussion about the lack of coordination between government institutions, difference in interpretation of laws, and the problems that the latter cause in the region. There were participants mainly from indigenous communities who privately discussed various issues in their native tongue.

Did old participants try to help the new ones in understanding the methods/contents/process?

Yes, old participants helped the new participants in understanding the objective of the Workshop and the methods, contents, and process.

4. Introduction of ROBIN scenarios

4.1) How was information presented?

The information presented was of the two scenarios: Paradise and Inequality and Caos. These were presented via powerpoint presentation, collages, and pictures.

4.2) How did the participants receive the ROBIN scenarios? What kind of comments did the participants have? Who/what?

The participants paid close attention to the description of the scenarios. However, some participants were tired due to the length of the workshop. Questions and comments were mainly conducted privately between participants and not necessarily via questions to the facilitator or researcher.

4.3) Was the outcome understandable? How did participants find the scenario thinking?

- **easy/hard**
- **useful/not useful**
- **facilitating free thinking/mind setter**

The participants easily understood the concept of the scenarios but not the difference between the scenarios (undesirable versus desirable).

4.4) Were the SHs interested in the ROBIN scenarios that are being developed in other countries (Brazil)?

There were no relevant comments; the participants only viewed the pictures.

5. Scenario development - FCMs of the future

Please send the outcome of the brainstorming and include pictures of the FCMs.

5.1) How did you organise the scenario building session?

In different groups? How many?

What was the criteria to group people?

During the scenario building activity, all participants at the workshop were included. For the first scenario, 27 people participated and for the second scenario 19 people participated. Initially, there was a brainstorming session for each scenario with the different ideas written down on a sheet of paper for everyone to see. Each person was then given a card to write down the issues that they considered important for that specific scenario. During the discussion, new issues were mentioned which were labeled using cards with different colors than those already included in the map from Workshop 1. The participants voted on the issue they felt were of higher importance with stickers. In the Paradise scenario, each person was given one sticker and in scenario building for Inequality and Caos scenario, each person was given two stickers due to the smaller number of participants.

Whose input was decisive in that discussion? Whose was not?

Who?	What?
COPNAG	Tendency in the region is for people to live off of forest management only and large-scale agricultural activities. People are forgetting about the value of traditional subsistence farming.
COPNAG	The procedures related to forest management plans are incorrectly implemented, there is too much logs that are felled which rots in the forest. There is insufficient control and capacity-building.
Sub-Gobernación	Criticized the history of forest management in the Guarayos region and the contradictions between the laws related to land titling and forest management.
COPNAG	Presently there is a new forest law that is being developed with the goal of sustainable management.
Facilitadora local	Highlights the importance of participation by communities and social control in the use of natural resources.
APROKAW	We´ve been offered seeds for agricultural production but the forest service (ABT) does not approve the deforestation plans. There are too many contradictions between different government institutions and programs; to reduce contradictions and confusion there needs to be better socialization of the different laws.
CECY	There is illegal land seizures going on, indigenous communities are losing their ancestral lands because people from the Altiplano and foreigners are buying these lands.
COPNAG	There´s confrontation because of the designation of indigenous lands in the lowlands which now includes highlands colonizers (indígena originario vs. indigena originario campesino) which the government wants to impose but the COPNAG guarantees that the Guarayos region will stay a TCO.

5.3) Was there place for experience-based knowledge as well as for scientific knowledge?

The workshop was based on local and personal experience of the participants.

5.4) Card technique. What issues did different stakeholders identify?

Desirable Scenario: Paradise	
Number	**Issues**
1	More financing, more help for locally owned businesses
	More work for everyone
2	Better family benefits
	Adequate prices for goods that are in relation to the average family budget
3	Poverty (less)
	Better education
	Better health services
	Human colonization in adequate areas
4	Protect the practice of subsistence agriculture Proteger la agricultura de subsistencia
	Implementation of agrosilvopastoral systems in degraded areas
	Sustainable small-scale agriculture
5	Degraded soils (less)
6	Adequate use of agrochemicals
7	Contamination of rivers and other waterways
	Potable water
	Less contamination, more river and waterway protection
	Less contamination
8	Illegal mining (reduction in)
9	More technical capacity building for local professionals
	Recover the coexistence with nature through capacity-building activities
	More local professionals
	Workshops by the forest service (ABT) on the new norms and on reforestation in the areas under forest management
	Technical capacity-building on topics related to new norms and laws
10	Watershed management
11	Regulation of large-scale agricultural expansion
12	Sustainable agriculture to ensure food security
	Sustainable productivity module (agriculture and cattle ranching)
13	Better infrastructures
14	Forest fires (prevention)
15	Sustainble forest management
	Repect the reserve of the local protected areas (no human titling)
	Protect the forest for environmental services such as clean air, oxygen, medicine and home construction material
	Sustainable use of the forest resources
	Sustainable use of natural resources, complying with legal norms and laws
	Adequate management of our forests

Desirable Scenario: Paradise	
Number	**Issues**
	Sustainable use of forest resources
16	More forestry plantations (for wood resources)
17	Honest authorities, less corruption
	Reduce the corruption
18	Regulation of hunting and fishing in restricted areas or protected areas
19	Socialization of norms, more participation on behalf of regulating government institutions (ABT, INRA)
	Better knowledge and diffusion of laws
	Coordination between institutions and communities on complicance with norms and laws; knowledge transfer to communities
	Comply with the laws and norms
	Comply with the norms to sustain the forests and their natural resources
	Laws that are adequate for regional needs
20	Deforestation
	Reforestation in degraded areas
21	Better environmental awareness
22	Better land use planning
23	Climate variability (less)
24	Better institutional Coordination

Undesired: Inequality and Chaos	
Number	**Issue**
1	Unregulated fishing and hunting
2	Lack of environmental awareness
3	Forest fires
4	Hunting, fishing, subsistence agriculture, and pasture burning (causes)
5	Deforestation of the forest
	Regulate deforestation
6	Destruction of fauna and flora
	Indiscriminate hunting of fauna
	Mortality rates among cattle
7	Loss of biodiversity
8	Lack of local leadership
9	Lack of regulation in private land ownership
10	Illegal land seizures
11	Extreme climatic phenomena (flooding and drought)
	Flooding
	Global warming
	Lack of water
12	Excessive mining
13	Excessive use of agrochemicals
14	Soil erosion
15	Loss of traditional cultura
16	Political instability
17	Corruption
18	Low agricultural productivity
19	Economic loss (low benefits)
20	Contamination of rivers and other waterways
21	Disease
22	Poverty
23	Lack of food (shortage)
24	Discrimination
	No to discrimination due to skin color or due to politics
25	Abuse of power

5.5) What were the reactions to presented issues?

Who supported, who criticised different views presented?

What kind of reasons for support/criticism was presented?

In general, there were no comments on the issues presented. In relation to the undesireable scenario, there were some comments.

5.6) Were there diverging views on the main issues discussed?

Tick here	*Please choose <u>one</u> of the following assertions that in your opinion describes the degree of **divergence on views of the main issues.** Please read all options before choosing one.*
	There wasn't any divergence at all.
x	There was very little divergence.
	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the main problems and discussing about them required a lot of time.
	None of the above. Better description is:

5.7) Did you find the presented issues surprising? Why, why not?

No, the issues were very similar to the present day scenario map. In the Paradise scenario, a participant mentioned to plantations, suggesting that plantations could be a path of development that would reduce pressure in the forests themselves. This was interesting and surprising because indigenous communities usually do not consider tree plantations as an economic alternative. Additionally, improvements in infrastructure, mainly roads, were identified as a strong factor in the Paradise scenarios. Lastly, participants identified the diffusion of norms and laws dealing with environmental issues as extremely important locally. In the Caos scenario, new illness was identified as a novel factor.

5.8) How were the identified problems linked/clustered together?

Who got to decide about the linkages?

Whose input was decisive in that discussion?

Which issues were left alone?

During the first scenario the facilitator made the links/weights and these were agreed upon by the participants. For the second scenario (Inequality), the links and values were decided by the participants themselves to increase participation in the workshop and to ensure that the participants understood the methodology being utilized.

Desirable Future: Paradise				
No	**Causal Factors**	**Consequence**	**Sign**	**Value**
1	More financing and external help available for the development of small businesses.	2	+	1
2	Better family level benefits	3	-	0.7
3	Poverty (Less)			
4	Protect subsistence agriculture.	3	-	0.5
		12	+	0.7
5	Degraded soils	3	+	0.3
		12	-	0.5
6	Adequate use of agrochemicals	7	-	0.7
		12	+	0.7
7	Contamination of water bodies (Less)			
8	Illegal mining (less)	5	+	0.7
		7	+	1
9	More technical capacity-building for local professionals	6	+	0.3
		10	+	0.7
		15	+	0.7
10	Watershed management (Better water resource management)	7	-	0.7
		15	+	0.5
11	Control over the expansion of large-scale agriculture	12	+	0.5
		20	-	1
12	Sustainable agriculture to guarantee food security	14	-	1
13	Better infrastructure	12	+	1
		15	+	0.7
14	Forest fires (Prevention)			
15	Sustainable forest management	14	-	0.7
		20	-	0.7
16	More forestry plantations as a food resource	15	+	0.7
17	Less corruption and more honest officials	15	+	0.7

Desirable Future: Paradise				
No	**Causal Factors**	**Consequence**	**Sign**	**Value**
		19	+	0.7
18	Fishing and hunting controls in areas that restricted or in areas designated as protective zones	15	+	0.7
19	Obey laws and their norms	15	+	1
20	Deforestation	23	+	0.7
21	Better environmental awareness	15	+	0.7
22	Better land use planning	15	+	1
23	Climate variability (less)			
24	Better institutional coordination	19	+	0.7
		22	+	1

Undesirable Future: Inequality and Caos				
No	**Causal Issue**	**Consequence**	**Sign**	**Value**
1	Unregulated hunting and fishing	6	+	0.5
2	Lack of environmental awareness	3	+	1
3	Forest fires	6	+	1
4	Hunting, fishing, small scale agriculture, and pasture burning (causes)	3	+	0.7
5	Deforestation	6	+	0.7
		11	+	1
		14	+	0.7
6	Destruction of flora and fauna	7	+	1
8	Lack of local leadership	9	+	1
9	Lack of private property rights	10	-	0.7
10	Illegal land seizure	15	+	1
		5	+	1
16	Political instability	17	+	1
		10	+	1
12	Excessive mining activities	6	+	0.7
		20	+	1
13	Excessive use of agrochemicals	14	+	0.7
		20	+	1
14	Soil erosion	18	+	0.7
17	Corruption	25	+	1
25	Abuse of power	24	+	0.7
18	Low agricultural productivity	19	+	0.5
		23	+	0.7
19	Economic loss (low benefits)	22	+	0.7
20	River and waterways contamination	21	+	0.7

5.9) Were any unexpected linkages between different issues formed?
No.
5.10) What kind of knowledge were people bringing into the exercise?
Local knowledge and practicality.
5.11) Any signs in cognitive learning detected?
Learning new things about the region? Give examples.
In the Guarayos region that are many complex issues and this participative workshop and the FCM methodology, the participants were able to prioritize what they perceive to be the most serious issues. For example, illegal land tenure (a very dynamic problem), the change in indigenous lands designation to include

colonization of immigrants from other locations, lack of coordination in the interpretation of laws governing land tenure and forest management between different government institutions.

5.12) Any signs of social learning detected?

Learning from each other? Give examples.

Learning as a result of discussions/debates with each other? Give examples.

Was common understanding of the problem detectable? Give examples.

A participant from CECY (Indigenous Center for the community of Yaguaru) gave a detailed explanation about the issue of illegal land seizures in the undesirable scenario in Gwarayu, their native tongue. This created an interesting debate and many were in agreement with this person.

6. Presentation of scenarios and discussion (plenary)

6.1) What kind of discussions took place?

Who supported, who criticised different views presented?

What kind of reasons for support/criticism was presented?

Whose input was decisive in that discussion? Whose was not?

6.2) How much the present and future FCMs differed from each other?

6.3) Were the FCMs for different scenarios very different from each other?

<u>GENERAL COMMENTS</u>

7. General observation of the whole workshop

Your own impressions:

7.1) Do you think it went well?

Yes, the workshop was carried out as planned. The workshop created expectations regarding main problems identified but also in the search and execution of solutions for the region.

7.2) Did it go how you had expected?

Yes, the workshop went as expected and we were able to do all the planned activities. There were a couple of small changes in terms of the schedule. The two scenarios that were planned were developed.

7.3) What was different in comparison to the first workshop?

There were more participants in this second workshop (37 compared to 30) and new local institutions (DIRENA, SEDACRUZ, APROKAW, CECU, CECY, AFI-Salvatierra). Not everyone stayed the entire time. Participants from the governor´s office, the COPNAG, and forest reserve Rios Blanco y Negro participated the whole day. People that were invited to the first workshop were also invited to this second workshop but several of them did not participate.

8. General observation during the workshop

8.1) Did discussion flow well and naturally, or was facilitation and motivation required much of the time?

Yes, the discussion flowed well and naturally but in terms of the technical aspects of the methods utilized the facilitators had to intervene frequently. These interventions were also necessary to increase participation. There was an active participant who also helped in focusing the discussions on the objectives of the

workshop. The facilitation was also utilized to ensure equal participation between groups and to control the times between each theme in the workshop program.

8.2) How much did the 'experts' intervene? How much were they asked for help? (experts like ROBIN people or other recognised as experts)

The “experts” or more specifically the facilitators, had to intervene frequently to try and focus the discussion to the scenario building activity. This was due to a lack of understanding at the beginning of the workshop about the workshop objectives.

8.3) In general, do you feel participants voiced their true opinion/viewpoints? Were they given enough opportunity to voice their true opinion/viewpoint?

In general, the participants voiced their true opinions and viewpoints. They were given ample opportunity to voice their own opinions although it was mostly participants from the COPNAG and the regional governor´s office that led the discussion.

8.4) Did participants listen to each other well?

Yes, the participants listened to each other well. There was a respectful atmosphere and everyone was given ample time to express their opinions. Everyone was interested in what was being expressed by other participants.

8.5) Were the most resourceful/influential/dominant participants the ones you expected? Who was most loud/outspoken? Who had the most convincing arguments? Who was not influencing?

There was active participation with the new participants. The older participants who were knowledgeable in the process of the workshop did not express their views with as much enthusiasm. The new participants which included people from the COPNAG and the regional governor´s office spoke often and were very active; specifically the COPNAG people. There was one professional from the regional governor´s office who stood out due to his influential arguments and he helped to clear up questions and guide the discussion. He also helped in directing the flow of the conversation towards the objectives laid out for the workshop. There were many participants that were not active during the workshop mainly from the radio station Misiones and indigenous communities Irarai and Curuvare.

8.6) What were the most fruitful times/methods for learning?

Brainstorming and card-technique.

8.7) What did the participants learn from each others? Any examples

This type of workshop allows the participants to update themselves on regional issues, new laws, new events that are occurring in Guarayos. Also, it increases the interactions between indigenous communities and allows interactions between communities, local organizations, state institutions and national institutions.

8.8) What did the participants learn from the presentations? Any examples

The participants learned the importance of classifying and prioritizing problems through the development of the cognitive maps. The participatory methodology utilized in the group discussions, the increase in local know-how, knowledge transfer between communities, and the use of this knowledge in environmental or educational projects are examples of the learning process.

9. General observation during breaks

9.1) Any clear 'groups' formed?

Yes, there were clear groups formed according to type of work and institution (COPNAG, state government, forest reserves).

9.2) Who was talking with whom?

Participants generally talked among themselves according to their institutional background

10. SH satisfaction

Please, send us the results of the mood-o-meters and the feedback questionnaire

10.1) How do you think participants felt about the workshop?

Most participants were satisfied with both the process and outcome of the workshop. They gave thanks and there is a build-up of expectations and interest with regards to the ROBIN project. Many participants hope to see the participation of other key stakeholders such as the Forest Service (ABT), the cattle ranchers, loggers, and farmers.

10.2) Atmosphere

Was general atmosphere throughout meeting constant, or did it change a lot?

In general, would you say it was enthusiastic/neutral/reluctant

The atmosphere in general was enthusiastic and neutral throughout the workshop. There were some changes in terms of level of interest due to tiredness and lack of concentration towards the end of the workshop. However, the participants maintained a decent level of energy during the second scenario building activity.

11. Methodological aspect

11.1) Was the scenario building easy/hard for the participants?

During the first brainstorming session, the participants were initially shy in regards to expressing their opinions and this session took more time in terms of the construction of the scenarios. Scenario 1 took more time and the facilitator had to insist and lead the activities. However, the construction of the second scenario was smoother, quicker, and there were more ideas that resulted from the brainstorming session. This second scenario was more participative, easier and with less intervention from the facilitator. The values given to the different scenarios were carried out with the facilitator but the participants ended up valuing the issues themselves. We highlight that the most difficult part of the scenario building was the links and weights given to these between issues.

11.2) Please give examples indicating mastering of the methods (can be about using the methods or even about deconstructing of the previous or this workshop's results with valid reasoning and arguments)

Many of the participants asked for help in understanding the relationship and links between issues. Others tried to help those that were having problems understanding the methodology utilized.

	Activity	Easy	Difficult	Medium
Scenario 1	Brainstorming			X
	Construction of the scenario		X	
	Values of the issues			X
Scenario 2	Brainstorming	X		
	Construction of the scenario	X		
	Values of the issues			X

11.3) Please give examples indicating confusion about the methods

Some participants did not understand the negative relation in the links between issues. In the relatedness and punctuation some participants did not understand the reasoning in the direction of the links and the values for the issues. We had to explain in a thorough way the scale utilized for the values and the links between specific issues. For example, expansion of large-scale agriculture and the use of agrochemicals.

11.4) Was it easy to gain participant's acceptance for the methods?

Yes, it was easy to gain the acceptance of the methods utilized and they considered it a useful methodology.

11.5) Was 'education' given by the old participants to the newcomers (what was told about the methods or results)

The old participants were understanding and patient with the new participants. We observed some comments from old to new participants to bring the newcomers up to speed. The old participants helped the new participants in understanding the rules developed for the workshop. They also helped in explaining the utility of the map, the results, and the importance of the participatory process of the ROBIN project.

12. Any final thoughts

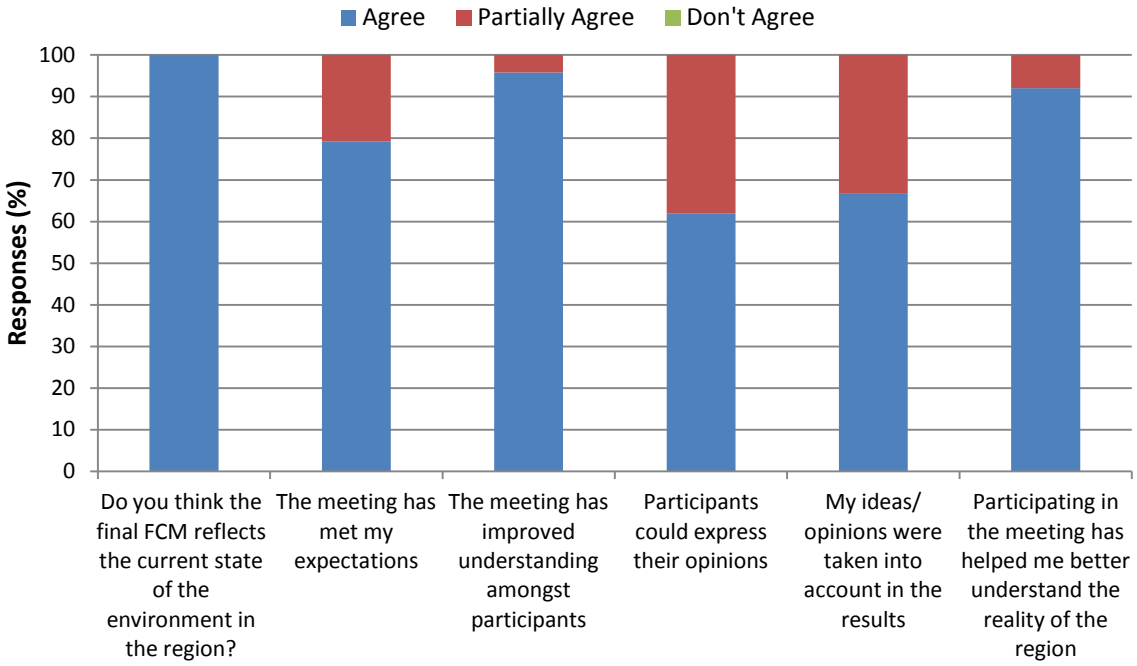
- A few participants were upset by the lack of participation of stakeholders such as the ABT, Association of Cattleranchers, and farmers who did not attend the workshop although they were formally invited.
- Although some participants did not know how to write, they tried to fill in the questionnaires and stayed until the end of the workshop.
- Many comments during the workshop were carried out in the native language Gwarayu.
- Female participants had great participation during the workshop and were more vocal than the young people participating. However, men did most of the talking overall.
- During the workshop, the facilitator made sure that all opinions were expressed openly and without time constraints.
- The workshop had media coverage. The local radio Guaguazuti conducted interviews with the president of the Guarayos indigenous organization (COPNAG) and the IBIF´s facilitator (Marisol Toledo) which were shown on the local television station.

7.1.4 Feedback analysis

This section offers a more in-depth review of the responses given by stakeholders at the end of the workshops. Stakeholders were asked a range of questions that related to the inclusivity, efficacy and utility of the workshops from their own perspective. All values that are quotes within the brief analysis relate to the corresponding figure.

7.1.4.1 The First Workshop

Figure 52 demonstrated that over 60% of stakeholders demonstrated that they agreed that other participants in the workshops were able to express their opinions, also stating that their own ideas and opinions were taken into consideration whilst developing the FCM. Just under 80% of stakeholders completely agreed that the workshop met their expectations, with more than 90% stating that participating in the



workshop helped them to better understand the reality of the region.

Figure 52. Stakeholder responses to a questionnaire reviewing their experiences of the first workshop in Ascensión de Guarayos.

Highlighting the success of the methodology and of those implementing it during the workshop can be seen by the stakeholder's responses to the questions relating to whether the workshop has improved their understanding of the problems associated with the area (96%), and whether the FCM developed during the workshop reflects the current reality of the environment (100%). What follows is a brief summary of the feedback given by the moderators of the first workshop.

The first workshop in Guarayos was a resounding success, with a diversity of stakeholders attending and contributing their views to the process. However, one group of stakeholders that did not attend, but who are widely considered to be exceedingly influential in the area were large-scale farmers (including Mennonites), which may suggest that the map is not wholly representative of the opinions held by all stakeholders within the region. In both groups, discussions were influenced by representatives of farmer´s federations, researchers and governmental organisations such as the Land and Forest Association (ABT). In spite of this, all stakeholders agreed that the factors highlighted within the workshop, and the discussions made were representative of the present state of the environment in Guarayos. Overall, there was very little divergence in opinions presented by stakeholders. It should be duly noted that the clarity of the scale of the problems appeared universal across the different stakeholder groups, with every individual being particularly firm in the opinion and vision of the present state. From a methodological perspective, the stakeholders appeared to grasp it quickly, thanks to the presence of experts and facilitators. A number of stakeholders mentioned that the FCM allowed them to improve their understanding of the linkages of the current problems within the area, and were satisfied with the results provided by the completed FCM. Over 90% of participants also stated that believed the use of cards allowed them to better understand the views and opinions of other participants. Participants stated the most difficult section of the methodology was the selection of factors and weighting the relationships between factors.

7.1.4.2 The Second Workshop

Similar to the previous figure, figure 53 offers an insight into the perceptions of the stakeholders present at the second workshop. Only 45% of stakeholders agreed that other participants in the workshops were able to express their opinions, with the other 55% stating that they partially agreed with this statement, which is considerably lower than in the first workshop where over 60% full agreed with this statement. However, when asked whether they believed that their own opinions and ideas were taken into account, over 70% responded that they agreed, which is marginally higher than in the first workshop. Showing an improvement on the first workshop, over 80% of stakeholders completely agreed that the workshop met their expectations, compared to just under 80% in the first workshop.

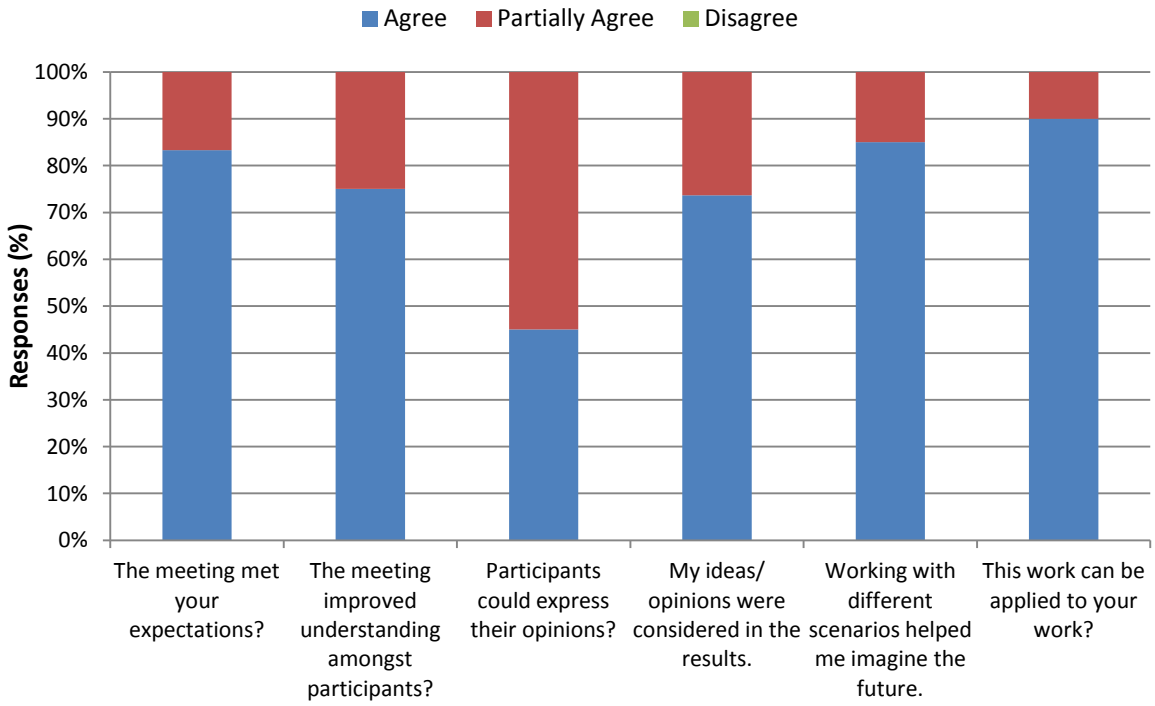


Figure 53. Stakeholder responses to a questionnaire reviewing their experiences of the second workshop in Ascensión de Guarayos.

Highlighting the success of the methodology and of those implementing it during the workshop can be seen by the stakeholder's responses to the questions relating to whether the workshop has improved their understanding, 73% of respondents totally agreed with this, distinctly lower than in the first workshop. However, 85% of respondents stated that working with scenarios helped them imagine the future., clearly highlighting the benefits of the scenario workshop. Despite some of the agreement levels being relatively low for some of the questions, it should be put into context that none of the respondents declared that they wholly disagreed with any of the statements/ questions and therefore the workshop should be considered a success in terms of improving stakeholders understanding and the methodology used.

What follows is a brief summary of the feedback given by the moderators of the second workshop.

The workshop was successful and was performed as planned, with a wide-range of stakeholders attending, unfortunately a number of participants from the first workshop were unable to attend. In particular members of the land authority (ABT) did not attend, which caused a certain level frustration with certain other participants. At times during the discussion the facilitators had to intervene in order to encourage greater discussion during the scenario building activity, which was due in part to a lack of understanding for the objectives of the workshop. In general, participants from COPNAG and the regional government led the discussions. This workshop allowed the participants to update themselves on regional issues, new laws, new events that are occurring in Guarayos. It has increased the interactions between indigenous communities, local organisations, state and national institutions. Participants were generally satisfied with both the process and the outcome of the workshops and there is considerable expectations being placed upon the ROBIN project within the local area. In terms of the methodology, at times the facilitators had to intervene in order to allow the discussions to flow, after a number of technical issues based upon the methodology. In particular, some participants did not understand the potential for negative relationships between issues. Also, there were some issues with how issues could be related and how these relationships could be quantified in terms of weighting them, similarly to issues raised in the first workshop.

7.1.5 Pictures of the Workshop*s*

7.1.5.1 The First Workshop in Guarayos

Introduction of the team, ROBIN and presentation of the program by M. Toledo

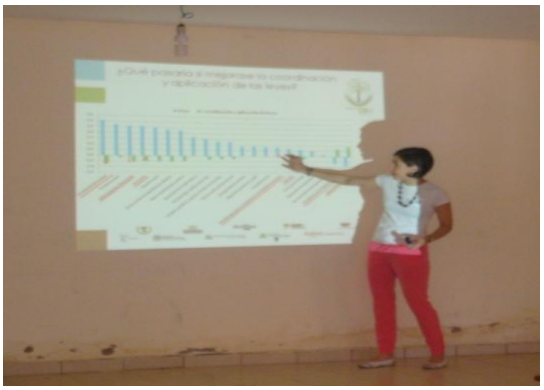
Ice breaking exercises for the participants

Listing factors considered by the stakeholders

Linking the factors suggested by the stakeholders

Participants of the first workshop in Guarayos

7.1.5.2 The Second Workshop in Guarayos

 Introduction of the team, ROBIN and presentation of the program by M. Toledo	 Dynamic of the FCM results by I. Blanco
 Observation of the content of the folder (FCM map of the present)	 Attention by the participants in the explanations of the facilitators
 Active participation in the mapping process by the local assistant.	 Explanation of the main factor (illegal land seizure) in the negative scenario.

7.2 Complementary materials from Chamela Cuitzmala SHW1 and SHW2

7.2.1 Agenda of the Workshop

Programa

"REFLEXIONES SOBRE LA INTERRELACIÓN ENTRE BIODIVERSIDAD, CAMBIO CLIMÁTICO Y DESARROLLO SOCIAL: PROPUESTAS PARA LA COSTA SUR DE JALISCO"

Sábado 26 de enero 2013, Universidad Guadalajara-CUCSUR / Instituto de Investigaciones Sociales, UNAM

Hora	Actividad	Responsable
11:00	Bienvenida	Elena Lazos/Peter Gerritsen/Manuel Maass
11:05-11:15	Presentación del equipo	Elena Lazos
11:15-11:20	Mencionar objetivos generales del taller Financiamiento internacional – preocupación internacional Involucramiento de actores locales Resultados a largo plazo	Elena Lazos
11:20-12:05	Presentación de los participantes (nombre y de dónde vienen) 30 min	Adriana
12:05-12:25	Presentación Proyecto	Peter Gerritsen
12:25-12:40	Receso (refrigerio)	
12:40-15:30	Trabajo en equipo:	Modera: Elena y Peter, Relator: Jazmin y Natalia
13:00-13:15	Explicar reglas del juego/Recordar Objetivos	
13:15-15:30	Trabajo en dos equipos. Facilitadores: Elena y Peter	
13:15-13:45	Transformaciones de la región en los últimos 40-50 años: ambiental, social, económico, político. ¿Cómo se ha transformado la región en los últimos 50 años?	
13:45-14:15	Factores que han provocado estas transformaciones ¿Qué ha provocado esto? ¿por qué?	
14:15-14:45	Ventajas y desventajas de estas transformaciones generales y locales	
14:45-15:15	¿Quiénes han ganado y quiénes han perdido? ¿Qué han ganado y perdido? ¿Quiénes se han visto favorecidos por estos cambios y quiénes se han visto perjudicados?	
15:30-16:00	Plenaria	Elena
16:00-16:15	Conclusión general y acuerdos para el siguiente taller	Peter
16:15-16:30	Clausura	Pdte Mpal Villa Purif.
16:30	Comida	

7.2.2 Report of the First Workshop

REPORT OF THE 1st STAKEHOLDERS WORKSHOP IN CHAMELA-CUITZMALA REGION, JALISCO, MEXICO

Date of the meeting: 1st Stakeholder FCM Meeting (C) – March 8th, 2013
Place of the meeting: Instituto Tecnológico Superior de La Huerta, Municipality of La Huerta, Jalisco
Pilot area: Región Cuitzmala-Chamela, Southern Jalisco, Western Mexico
Reporter (name/institution): Dra. Elena Lazos Chavero (Instituto Investigaciones Sociales, UNAM) and Dr. Peter R.W. Gerritsen (Centro Universitario de la Costa Sur - CUCSUR, Univ. Guadalajara)

Facilitator (name/institution): Dra. Elena Lazos Chavero (UNAM) and Dr. Peter Gerritsen (Universidad de Guadalajara)

Experts for the Workshop C: Dra. Consuelo Varela and Dr. Irene Blanco (UPM, Spain)

Rapporteurs and observers: Lic. Natalia Alvarez Grzybowska (CUCSUR, Universidad Guadalajara) and Lic. Jazmín Solís Carpio (IIS, UNAM). Participation of Ing. Indi Oyarzun Gaitan (University of Wageningen) and Barbara Smetschka (UNIKLU)

Table 14. List of participants at first stakeholder workshop in Chamela-Cuitzmala

Número	Edad	Comunidad	Oficio (productor/funcionario)
1	**55**	Pabelo	**Productor**
2	53	Villa Purificación	Asesor técnico independiente
3	46	Jirosto	Productor, Comisario ejidal
4	35	Las Pilas	Productor Ganadero y agricultor
5		Ranchitos	
6	64	Reforma Agraria	Presidente consejo de vigilancia
7	67	Reforma Agraria	Consejo Municipal Cadena forestal
8	53	Fundación Cuitzmala	Coordinador Científico
9	43	Secretaria de Medio Ambiente, Jalisco	Dir. Planeación y Desarrollo Sustentable
10	42	JIRA	Director de JIRA
11	49	Universidad de Guadalajara, CUCSUR	Investigador
12	51	cihuatlan	director de ecologia
13		Instituto Tecnológico Superior La Huerta	Rector
14		CONAFOR	Por parte de la dirección
15	25	La Huerta	Dir. Ecología
16	55	CIECO UNAM	Investigador titular
17	34	CONAFOR	Jefe de Depto. Silvicultura Comunitaria.
18		Académico	Profesora Investigadora UNAM
19	27	CONAFOR	Proyecto "Gobernanza local para REDD+"
20	38	CDI	Responsable de modulo Chancol (Cuautitlan)
21	49	Universidad de Guadalajara, CUCOSTa	Profesor investigador
22	56	CONANP	Subdirector
23	32	CONANP	Técnico
24	42	Ayuntamiento la Huerta	Tesorero
25	25	JIRA	Técnico Forestal Regional
26	38	SEMADES	Recursos Naturales
27	38	Cihuatlan	Secretaria de Turismo

Número	Edad	Comunidad	Oficio (productor/funcionario)
28	30	CONAFOR	Coordinadora de proyecto LAIF

1.1) Were all stakeholders represented? Who was missing? Why?

The majority of the invited farmers were missing. Only five of them arrived to the workshop, mainly because they lived close to the workshop location. We invited them by phone. We think we need to invite them personally and explain them the importance of the workshop. If not, they always have a lot of work, and they do not want to lose their time. Farmer´s absence can also be explained as the FCM workshop date coincided with many other meetings.

The mayors were also missing. They said they had other activities to do.

1.2) Describe shortly how you invited participants.

(Program and invitation letter included at the end of this report)

We wrote a letter of invitation and the program of the workshop. We sent these two letters to everyone that was invited. When they had an email address, we send it through this way. But we also phoned them. The ones that did not had an email address, we only phoned them.

How did you identify the persons to be invited?

From the preparatory workshops, we selected the most interested and participative persons, taking into account that a representative selection of stakeholders should be assured. We should have kept a long list of invited peasants in order to assure a good representation of them. But as the European experts told us that a small group was always better, we were afraid of inviting many, and having a big group of persons. For next time, we will invite more, so we can assure a good proportion of farmers and peasants.

Was it easy to get these people interested?

In the preparatory workshop, they showed a lot of interest, and they thought it was a good idea to make a second workshop.

The persons that did not attend, when they were asked by phone, all gave working reasons, this is, they had a lot of work and couldn't assist to the workshop. Besides, as commented before, there were a lot of other meetings in the region before and after the FCM workshop.

2. Atmosphere in the beginning

At the beginning of each workshop, we distributed a flyer with the program of the day, the goal- of the workshop, and the universities and researchers responsible for the organization (letters and program at the end of the document). Each participant gave its personal data and they received a banner with their name and a banner with the name of the institution or of their community.

There was a very good atmosphere. We knew almost all the participants, so we started to talk about their work and the region's problems. In some cases, we talked about their family.

We made an official inauguration. From ROBIN, the Mexican team were giving some welcoming words for the inauguration, and the President of Villa Purificación made the official inauguration for being the institutional host from the region.
After that, the Mexican team made an introduction of the ROBIN project and team, explaining their different responsibilities and their origins (nationalities and universities where they work). After, all the participants introduced themselves, giving name, institution or activity developed and their interest in participating in the workshop.
We discussed about the importance of the workshop, and many doubts rose. Some of the participants, mainly from institutions, were questioning the importance of the workshop, as then they did not see how the results could be incorporated in more practical solutions.
Afterwards, the UPM team explained the FCM methodology and how has been used in other countries and their experiences. They presented some of the results from the watershed workshops in Spain where they participated.

3. Discussion on the main issues related to the state of the natural environment in the Pilot Area
Brainstorming was not carried out

4. Mapping main issues (card technique)
Reported in Point 6

5. Spidergrams
Not applicable. Done by the ROBIN research team after the workshop

6. FCM of the present
6.1) How did you organise the FCM session?
In different groups? How many?
What were the criteria to group people?
Please give a list of participants to different groups and name or number of the group
We divided the group into two groups, trying to balance the group in order to have government institutions, academics, local authorities, and farmers in both groups. The first two types of SH (government officials and academics) dominated the group, so they were participating the most, and dominating the answers, although they were always respectful and always considering the farmers. But the farmers could not follow up all the questions and did not fully understand the use of this type of workshop. There were few interventions of the farmers.
The pointing question was:
Which are the factors that have been influencing the actual state of land use and of the environment during the last 50 years?
1) First group
The first group was mainly pointing out:

a. The colonization program during the last 80 years provoked the major transformation

b. The government politics drove to extensive cattle-raising and provoked a major deforestation process.
c. The national and international markets. For ex. The expansion of the meat market
d. The development of tourism and privatisation of the territory
e. Lack of institutional coordination – tension between the productive politics and the environmental politics
f. The land reform that did not function and provoked more conflicts than solutions.
g. The political clientelism of the development politics
h. Lack of education
i. Lack of organization of the population
j. Lack of implementation of the ecological planning by the local authorities
k. Mining
l. Transformation of local culture by the north-american culture. Now everybody wants to be rich and has adopted the consumerism culture.
m. Lack of ecodevelopment techniques and sustainable alternatives

Afterwards, they voted for the most important factors:

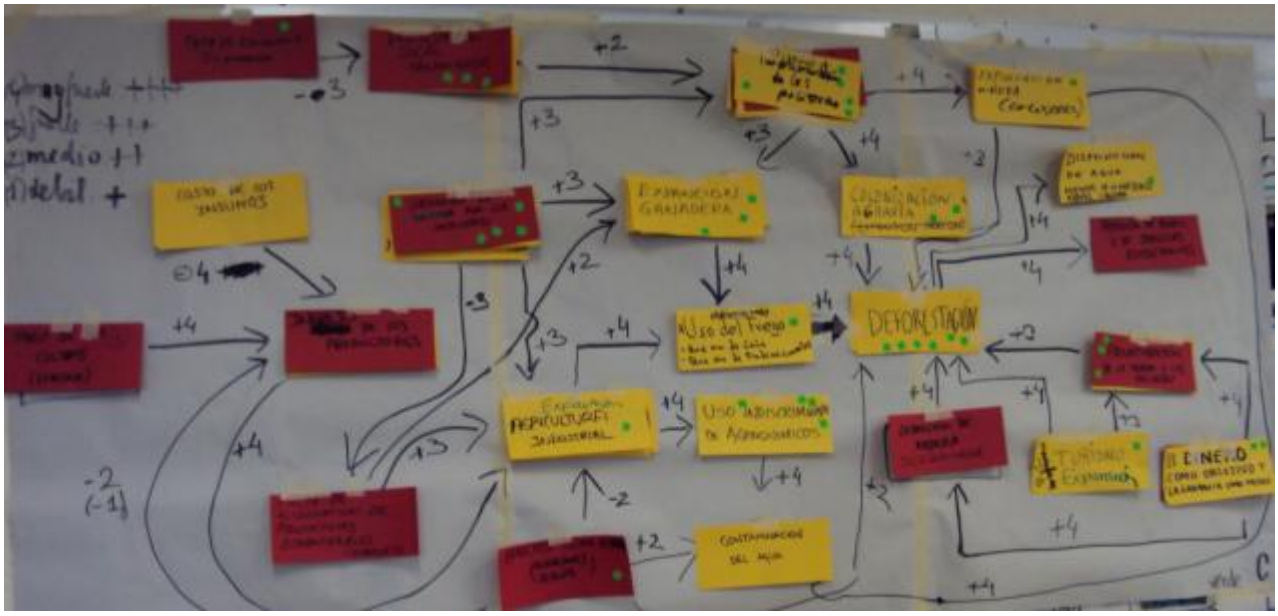
a. deforestation,
b. lack of institutional coordination
c. development of markets that drives land use changes
d. use of agrochemicals
e. privatization of land
f. expansion of cattle raising
g. influence of climate extremes
h. use of fire to control weeds
i. development of tourism
j. culture of money

The second question was: **how do these factors relate each other and how does a factor influence one another?**
The most voted factor, deforestation, was place to the center and then the ROBIN team asked: what is provoking deforestation?

a. Fire (because of agriculture and cattle raising's needs)
b. Cattle raising development
c. Markets driven to certain type of agriculture and cattle raising
d. Privatization of land
e. In order to satisfy needs, illegal deforestation
f. Development of tourism
g. Land reform
h. Climate change – drought provokes more deforestation
i. Mining
j. Lack of education among the rural population
k. Lack of information and education among the decision makers. "bola de ignorantes"
l. Narcotraffic
m. Lack of other economical alternatives
n. Middlemen in commercialization take the major part – bad prices

Afterwards they gave points of the importance of the influence among each factor. The session was dominated by academics (ecologists) and by forestry institution (CONAFOR). There was only one peasant of the social sector (ejidatario). Even if

there was only one peasant, it is important that the land privatization was mentioned.



2) The second group

The second group had the same starting question as the first group. Which are the factors that have been influencing the actual state of land use and of the environment during the last 50 years?

The important points were:

a. Lack of institutional coordination – tension between the productive politics and the environmental politics
b. Lack of coherence between national and local policies: they are designed at the national level but they do not take in consideration the local conditions.
c. The colonization program during the last 80 years provoked the major transformation – new ejidos
d. The lack of trust to the government policies
e. Lack of work
f. Mining
g. Lack of respect to the indigenous communities – they have been invaded by private farmers
h. Economical national and global model
i. The construction of infrastructure (roads, dams that resulted to be useless)
j. Lack of productivity and poor soils
k. The development of tourism
l. Lack of communication between authorities and population
m. Lack of link between policies and local needs
n. fires
o. The fragility of ecosystems
p. The loss of agrodiversity
q. Development of sugar cane that involved a big use of agrochemicals and the river pollution

r. Loss of cultural identity, loss of respect, quality of life based on money
s. Prevalence of the individual interest over the collective/ communal one
t. Loss of biodiversity, loss of ecosystem services
u. Inequity of the different SH to the decision making process
v. Deforestation
w. Fragmentation of natural ecosystems
x. Lack of security to invest
y. Lack of credits for agriculture and for reforestation
z. Lack of education or capacitation to the population/ lack of environmental education at school
aa. Low prices in the agricultural market
bb. Lack of political arenas to access the social participation
cc. Procede – privatization of land
dd. Loss of the respect to laws

As we see, they pointed more detailed factors, and when we wanted to bring them together, there was a big discussion over this point. That is the reason we left them as different points.

The second question was: how do these factors relate each other and how does a factor influence one another?
There was an important discussion about the semantics of words and their meanings. For example: Is it the same process, the loss of biodiversity, deforestation, and loss of forests? There was a big discussion about not to lose the richness of the differences, and this was mainly because we had various biologists in the group that were considering these processes to be very different.
Afterwards there was a confusion of ideas between causes, factors, and consequences. For ex. The wrong policies had 6 points, and loss of biodiversity 5, and bad management of resources 4. But then it was discussed if the policies are causes of the loss of biodiversity or the wrong policies are also a factor at the same level that the loss of biodiversity.
There was a criticism that the exercise was going wrong, because it was inductive and simplifying the processes.
“There was an induction to put loss of biodiversity at the center, when they were saying that there were economical factors more important and that they should be at the center.” They were insisting that it was very difficult to prioritize the factors, “because there are very related factors that have the same weight or importance.”
Finally, as there were many factors, we vote for the most important factors, in order to center on these ones.

No.	FACTORS	Votes
1	Lack of institutional coordination	0
	Lack of link between policies and population	
2	Inadequate application of the policies	6
	Public policies without linkage to local needs	
	"Ley de desmontes"	
	Change in land tenure	
3	Lack of respect to the law	1
	Centralized legislation difficult to apply	
	Lack of trust in the governmental institutions	
4	Poor planning and organization in the productive branch	0
5	Lack of communication between authorities and inhabitants	0
	Lack of arenas to an adequate local participation	
	Lack of promoting interinstitutional arrangements and participation of the SH to the decision making process	
6	Inadequate management of NR	4
	Inadequate use of forestry management	
	Inadequate use of pasturelands	
7	Power relations and inequity	0
8	colonization	0
9	Forest fires	0
	Lack of rules in the use of fire	
10	Robbery of wood	0
11	Low quality of water	1
	Low quality and quantity of water during the drought	
	Lack of water	
12	Low use of water	0
13	Pollution of rivers by mining	1
14	Lack of transparency and information in the management of mining	0
15	Lack of land rights in indigenous communities	0
16	Land use change	1
17	Fragility of ecosystems	0
18	Loss of biodiversity	4
	Loss of biodiversity and ecosystem services	
19	Loss of agrodiversity in the local communities	0
20	Loss of forests	1
	Bad management of forest resoruces	
	Deforestation	

No.	FACTORS	Votes
21	Reduction of fertility soil	2
	Low yields in the agricultural systems	
	Low productivity of the agrosystems (productivist model-monoculture)	
22	Indiscriminated use of agrochemicals	0
	Pollution of water	
	Pollution of water by agrochemicals	
23	Loss of link to land	1
	Loss of cultural identity	
24	Government model	3
25	Quality of life	0
26	Fragmentation	0
27	Low incomes of the farmers	2
28	Lack of security in investment	0
29	Prevalence of the private interest over the common interest	1
	Loss of human values and respect	
	Loss of collective sense	
30	Lack of awareness	0
31	Lack of environmental education	2
	Low capacitation to communities for a diversified management of the biological resources	
	Lack of communication	
32	Economic model	3
	Economic model based on money and consume	
33	Development model	1
34	Poverty	0
35	Infrastructure	1
36	Development of accelerated tourism	0
37	Lack of work	1
	lack of sources of work	
38	Lack of aid to the agricultural development	0
	Lack of credit	
39	Non fair market (profits only for middlemen)	0

From the discussion groups, we can conclude that the SH of group 2, were very much concerned in the lack of coordinated policies, much more than inadequate policies. They were mentioned, but the most important points were the lack of coordination between the environmental and the productive policies. And the other important factor that was very much discussed was the lack of coherence between the policies and the local needs and local conditions (inadequate policies). They were designed at the national and federal level, and the local conditions were never considered in the whole design. A very important point that was very much discussed was the cultural transformation in the last few decades. The idea of individual progress and of making

money at the fastest way, were stressed as factors that induced the ecological deterioration (deforestation, use of inadequate agricultural practices).

Even though, the FCM of the second group was not finished, as there are some factors that were not interrelated and not given a value of influence, we will use the information as it is, and we will complete it with some of the local SH that attended the workshop. From the non- interrelated factors, some are very important and were mentioned by group 1 (i.e. the loss of agrodiversity). This activity will be done in August, before we realize the second FCM. There are mainly four reasons to include the exercise: a) The SH that participated in the exercise will be totally disappointed if we do not consider their diagram; b) there are some factors that were not mentioned by the other group that are extremely important (for example, some cultural and educational ones, the lack of land rights for the indigenous communities); c) the main factors are also some factors that were mentioned in group 1, and this confirms that even though we were working in two groups, we reached to similar conclusions; and d) finally, there was a lot of work and interest put into this exercise that we should respect.

Plenary

Each group presented their results. They also presented the confusions and the oversimplification of the processes.

During the last hour, we discussed proposals that were coming from the stakeholders. During the introduction, the SH expectations were to construct collective proposals. They said that they knew a lot of their actual and historic problems, but that they had to profit that they were together to come to concrete proposals. There were several program directors and academics that wanted to construct together some future activities. We had some proposals coming from the preparatory workshops. We discussed these proposals and besides, they had new ones.

NEW PROPOSALS
Tree nurseries for families
Family Reforestation
Reforestation supported by the government
Material reciclying
Family dams
Control fires

PROPOSALS	TASKS	RESPONSIBLES
Environmental education	Courses in ejidos and primary schools. Elaborate a strategy Negotiation with SEP-SEE	Ángel Verduzco Ejidos Antonio Ordorica SEMADET Arturo Pizano JIRA UdG, IIS informar
Agroforestry and cattle raising alternatives	Workshop of organic agriculture Contact Carlos González y Horacio Paz	UdG Peter Gerritsen CIECO-UNAM
Protect zones of biodiversity	Voluntary schemes	Antonio Ordorica SEMADET CONANP Reserva Biósfera Chamela Reserva de la Biósfera Sierra de Manantlán
Link science, politics, and society	Link efforts of SEMADET, Social, Ayuntamiento andState Meeting with CONAFOR Projects to inform policies	Red de académicos de Chamela, Manantlán, CUCSUR Patricia Balvanera y Manuel Maass
Proposal of a intermunicipal association	Linking to the descentralized organism	CONAFOR Municipios SEMADET
Ordenamiento territorial	Include ejidatarios that live in the region	SEMADET SEMARNAT Municipio
Comité de seguimiento	Constitute a commission to evaluate the achievements	UdG y IIS

6.2) What kind of discussions took place in the groups?

Who supported, who criticised different views presented?
What kind of reasons for support/criticism was presented?
Who got to decide about the linkages and their weights?
Whose input was decisive in that discussion? Whose was not?
See point 4.1 above

6.3) Were there diverging views on the FCMs produced in the groups? Fill in the following table(s).

Group 1

Tick here	*Please choose <u>one</u> of the following assertions that in your opinion describes the degree of **divergence of views in the group.** Please read all options before choosing one.*
	There wasn't any divergence at all.
	There was very little divergence.
x	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the issues and discussing about them required a lot of time.
	None of the above. Better description is:

Group 2

Tick here	*Please choose <u>one</u> of the following assertions that in your opinion describes the degree of **divergence of views in the group.** Please read all options before choosing one.*
	There wasn't any divergence at all.
	There was very little divergence.
	There was some divergence and we needed to lengthen discussions because of them.
x	There were very divergent views on the issues and discussing about them required a lot of time.
	None of the above. Better description is:

6.4) Did you find the presented issues surprising? No, as many of the problems were established during the two preparatory workshops and also during some interviews.

6.5) How were the problems linked? With problems and confusion

Who got to decide about the linkages? Institutional and government officials and academics

Those input was decisive in that discussion? Institutional and government officials and academics

Which issues were left alone? We tried not to let issues alone, but it was difficult and kind of inductive.

6.6) Were any unexpected linkages between different issues formed? No

6.7) Methodological aspects of Card Technique:

Was it easy to name the issues by each participant?

Was it easy/hard to find clusters of the issues? Difficult

Did new issues arise while clustering? Yes.

6.8) What kind of knowledge were people bringing into the exercise? (any references to science; references to own experience in the field; references to the history of the region)

Everybody was bringing their own experience; the academics were bringing in key concepts that most farmers were not familiar with. However, everybody, in one way or another, was referring to the history of the region.

There was place for experience-base knowledge as well as for scientific knowledge: The NGOs and the government institutions enriched the session with experience-based knowledge, and the academic world gave a lot of scientific inputs. There were nice discussions around these aspects, but unfortunately, we could not have fully represented the experience-based knowledge of the peasants and farmers, because of their small number, but also because they did not fully participated.

6.9) Any signs in cognitive learning detected? Learning new things about the pilot site or the region?
The workshop permitted a first approach to a collective learning experience, but time lacked to really get new indepth insights and knowledge.
6.10) How do the different FCM's relate to one another? Similar, different?
Quite a lot. The main factors are the same. It differs in the weight given to each factor.
6.11) Methodological aspects of FMC

Was the use of FCM easy/hard for the participants? It was very difficult, especially for farmers as they learn in a different way

Was the FCM helpful in stimulating system thinking (cognitive learning) and social learning (between different participants)? Non, as there was no time enough and the model resulted quite inductive. Note that there was a severe time constraint, as participants only could stay one day.

How were different kinds of knowledge handled during the process? (Different knowledge like science, practical knowledge, experience, etc.)? Yes, although the practical knowledge was not enough expressed because there were very few farmers.

7. End of the day thoughts:
7.1) Who was most loud/ outspoken?
The academics, and the environmental governmental institutions.
7.2) Who had the most convincing arguments (*'convincing' meaning s/he could convince others, not necessary convincing in your opinion*). Based on what knowledge, based on which arguments?
Scientists and academics, and the ecological governmental institutions.
7.3) Who was not influencing? The farmers were influencing very little.
7.4) Was different participants' input as expected?

Did participants present any unexpected comments? Yes, they expressed there was a kind of manipulation.

Were the most resourceful/influential/dominant participants the ones you expected? Yes

Did someone become unexpectedly influential? The farmers were always well heard.

7.5) How much did the 'experts' intervene? How much were they asked for help? (Experts like ROBIN people or other recognised as experts) It very much depended in relation to the session. In one session, synergy emerged, in the other this was less present.

8. General observation of the whole workshop
Your own impressions:
8.1) Do you think it went well? The workshop achieved its final goal, but a thorough reflection on methodology is required.
8.2) Did it go how you had expected? Yes, except for the fact that there was an underrepresentation of local stakeholders (i.e. farmers)

8.3) What went as according to your expectations?
A collective analysis of the current regional problematic was achieved
8.4) What went contrary to your expectations? The farmers' absence
8.5) What is your general feeling of how the workshop was designed/structured/carried out? In general, the methodology is very inductive. Furthermore, the direct benefit of the results for participants is not that clear.

9. Participant satisfaction
9.1) How do you think participants felt about the workshop? Participants' general feeling is a less theoretical and a more practical problem solving oriented workshop.
9.3) Methodological aspects

How did you carry out the mood-o-meter exercise? Very quickly
Did it work? Only partially
Any suggestions for improving the technique? How would you do it differently in the future? Yes, we would do it different. We have to have time for a discussion about what they liked and about what they did not like.

10. General observation during the workshop
10.1) Did discussion flow well and naturally, or was facilitation and motivation required much of the time? Discussion flew well
10.2) In general, do you feel participants voiced their true opinion/viewpoints? The gave their true opinions
10.3) Were they given enough opportunity to voice their true opinion/viewpoint? Yes, but time was lacking for further discussion
10.4) Did participants listen to each other well? yes

11. General observation during breaks
11.1) Any clear 'groups' formed? No clear groups were formed, but there was a tendency of "institutional" grouping, according to institutional operative level (regional, national, federal
11.2) Who was talking with whom? See point 11.1

12. Feedback
12.1) Apart from the feedback questionnaire (sent and processed separately from this report), what kind of feedback did the participants give? During the breaks, informal conversations took place

13. Any final thoughts?
13.1) What could you suggest for improving the workshop in the future?
Give more time to talk and express
Give possibilities that they appropriate of the workshop
They have to have more time for the proposals
They want to build concrete solutions.
Think in a more simple visualization technique
13.2) Anything in particular you would add/remove/change?

We do not recommend the FCM methodology, when farmers are present because they cannot express themselves. Everything goes too fast and in terms that they do not understand, even you explain them, but the concepts are difficult to be seized. Furthermore, the FCM visualization is difficult to understand for them.

13.3) What about the process of observing/recording/reporting /interviewing/doing questionnaires…?

We had an excellent group that could do the observing, the recording, and the interviewing.

México, D.F., 8 de febrero de 2013

ESTIMABLE BIOL. ALVARO MIRANDA

ASESOR DE LA FUNDACIÓN CUIXMALA

PRESENTE

En el marco del proyecto ROBIN financiado por la Unión Europea, la Universidad Nacional Autónoma de México y la Universidad de Guadalajara los invitan a participar en el Tercer **Taller** *"Reflexiones sobre la interrelación entre Biodiversidad, Cambio Climático y Desarrollo Social: Propuestas para la Costa Sur Jalisco". S*e llevará a cabo el **9 de marzo** del presente año en las instalaciones del **Instituto Tecnológico Superior de La Huerta** en la ciudad de La Huerta, Municipio del mismo nombre, de las **9 a.m. a las 6 pm**.

El objetivo es reflexionar conjuntamente entre productores, campesinos, comunidades indígenas, funcionarios de distintas instituciones gubernamentales, científicos sociales y naturales, empresarios del sector turístico y el sector conservacionista, actores que juegan un papel importante en la transformación socioambiental de la región. Es una preocupación internacional la pérdida de la biodiversidad y sus consecuencias en el cambio climático, para ello se plantean distintas alternativas. Pero nos preguntamos, ¿existen propuestas por parte de los actores sociales locales?, ¿qué tipo de propuestas?, ¿podemos establecer estrategias conjuntas?

Nos interesa discutir estas interrogantes con Ud. porque creemos que su accionar y su participación es muy importante para el devenir socioambiental de la región. En este sentido, lo invitamos cordialmente para poder intercambiar ideas, propuestas, sentires con el fin de ir construyendo poco a poco escenarios plausibles futuros.

Este taller se plantea con base en los resultados obtenidos en los dos primeros talleres realizados el 26 y el 28 de enero del presente año. En los dos talleres celebrados con la presencia de distintos actores, los principales problemas detectados fueron los procesos de deforestación que continúan en la región sin una coordinación

institucional a los diferentes niveles y la distribución y abatimiento de los ríos sin un claro rumbo ni una coordinación institucional.

Por ende, proponemos que los ejes a analizar serán la deforestación y la distribución y calidad del agua, temas que serán entrelazados bajo las perspectivas de los actores cuenca arriba con las de los actores cuenca abajo. Utilizaremos la técnica del mapeo cognitivo para establecer la influencia de los distintos parámetros en la pérdida de biodiversidad. Esto nos ayudará para construir un primer plan de trabajo entre los distintos participantes para plantear estrategias y alternativas en la problemática de la deforestación y en el manejo del agua.

Los gastos de transporte, los refrigerios y la comida serán cubiertos por el proyecto. Favor de confirmar su asistencia para poder organizar el taller y toda la logística necesaria a través de nuestra dirección electrónica. Para cubrir el gasto del transporte, le pedimos solo facturar gasolina a nombre de la UNAM. (Incluimos el RFC y dirección de factura de la UNAM). No podremos pagar sin la entrega de la factura a nombre de la UNAM.

Esperamos contar con su valiosa presencia, Saludos cordiales,

Dr. Elena Lazos Chavero (lazos@unam.mx)

Instituto de Investigaciones Sociales,UNAM

Dr. Peter R.W. Gerritsen (prw.gerritsen@gmail.com)

Departamento de Ecología y Recursos Naturales - Imecbio

Centro Universitario de la Costa Sur, Universidad de Guadalajara

UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO
RFC: UNA2907227Y5
Av. Universidad No. 3000
Col. UNAM, CU, 04510 Coyoacán, México, D.F.

Programa

"REFLEXIONES SOBRE LA INTERRELACIÓN ENTRE BIODIVERSIDAD, CAMBIO CLIMÁTICO Y DESARROLLO SOCIAL: PROPUESTAS PARA LA COSTA SUR DE JALISCO"

Sábado 26 de enero 2013, Universidad Guadalajara-CUCSUR / Instituto de Investigaciones Sociales, UNAM

Hora	Actividad	Responsable
11:00	Bienvenida	Elena Lazos/Peter Gerritsen/Manuel Maass
11:05-11:15	Presentación del equipo	Elena Lazos
11:15-11:20	Mencionar objetivos generales del taller Financiamiento internacional – preocupación internacional Involucramiento de actores locales Resultados a largo plazo	Elena Lazos
11:20-12:05	Presentación de los participantes (nombre y de dónde vienen) 30 min	Adriana
12:05-12:25	Presentación Proyecto	Peter Gerritsen
12:25-12:40	Receso (refrigerio)	
12:40-15:30	Trabajo en equipo:	Modera: Elena y Peter, Relator: Jazmin y Natalia
13:00-13:15	Explicar reglas del juego/Recordar Objetivos	
13:15-15:30	Trabajo en dos equipos. Facilitadores: Elena y Peter	
13:15-13:45	Transformaciones de la región en los últimos 40-50 años: ambiental, social, económico, político. ¿Cómo se ha transformado la región en los últimos 50 años?	
13:45-14:15	Factores que han provocado estas transformaciones ¿Qué ha provocado esto? ¿por qué?	
14:15-14:45	Ventajas y desventajas de estas transformaciones generales y locales	
14:45-15:15	¿Quiénes han ganado y quiénes han perdido? ¿Qué han ganado y perdido? ¿Quiénes se han visto favorecidos por estos cambios y quiénes se han visto perjudicados?	
15:30-16:00	Plenaria	Elena
16:00-16:15	Conclusión general y acuerdos para el siguiente taller	Peter
16:15-16:30	Clausura	Pdte Mpal Villa Purif.
16:30	Comida	

7.2.3 Feedback Analysis

This section offers a more in-depth review of the responses given by stakeholders at the end of the workshops. Stakeholders were asked a range of questions that related to the inclusivity, efficacy and utility of the workshops from their own perspective. All values that are quotes within the brief analysis relate to the corresponding figure.
In terms of whether participants agreed that other stakeholders were able to express their opinions, 60% of respondents stated that they agreed with this, with the other 40% stating that they partially agreed. The level of agreement rose to 65% when participants were asked whether they believed that their own opinions were considered, with the rest stating partial agreement. 85% of stakeholders completely agreed that the workshop met their expectations.

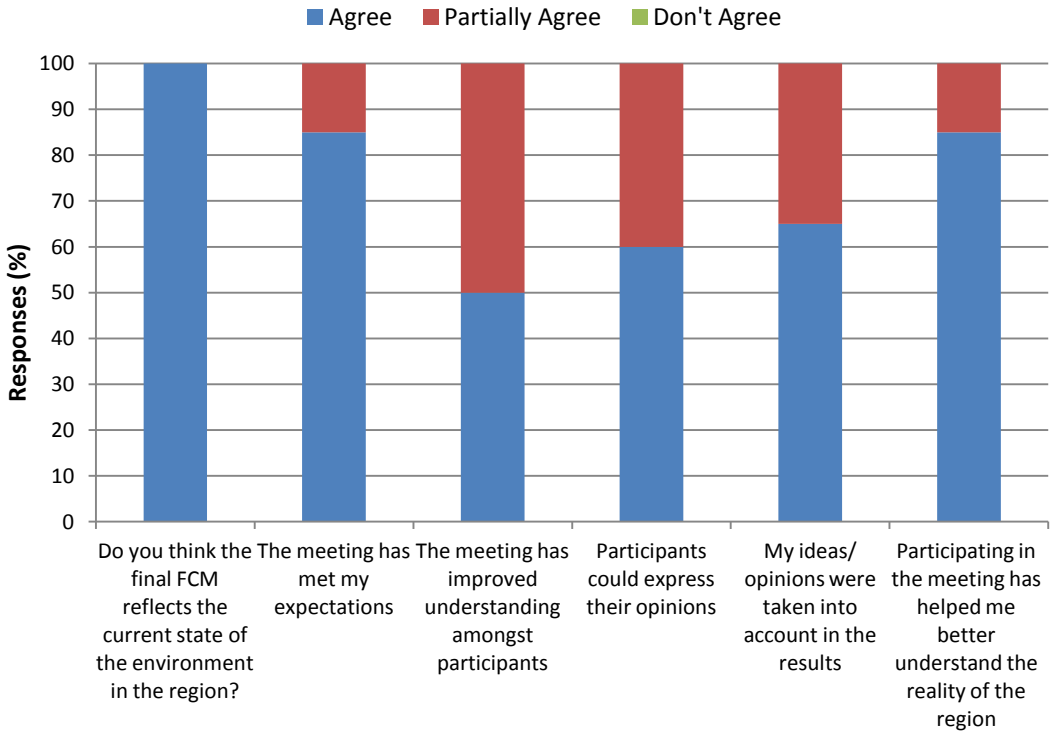


Figure 54. Stakeholder responses to a questionnaire reviewing their experiences of the first workshop in Cuitzmala- Chamela.

Highlighting the success of the methodology and of those implementing it during the workshop can be seen by the stakeholder's responses to the questions relating to whether the workshop has improved their understanding of the problems associated with the area (85%), and whether the FCM developed during the workshop reflects the current reality of the environment (100%). The following is a brief summary of the analysis of the workshop offered by the moderator of the workshop.

The first workshop in Chamela- Cuitzmala was successful, with a range of stakeholders participating and adding their views to the process. Unfortunately, the majority of

farmers invited to the workshop were missing due to work commitments that could not be postponed. The experience of members from NGOs and governmental institutions enriched the session greatly from a wealth of experience based knowledge, however due to only 5 farmers attending, and with them being largely reluctant to express themselves there may be the possibility that the results of the workshop may not fully represent the actual realities of the present situation in the area. At times the discussions were largely dominated by members of governmental institutions and academics -in spite of the fact they allowed farmers to speak and express their views- the discussion of the present situation was largely formulated by the opinions of the representatives of both the government and academics. There were some issues related to semantics and the manner in which is some factors affected others, or vice-versa. Due to this, and also that there was some divergence of views within the group, discussions were lengthened to a greater extent than anticipated.

7.2.4 Pictures of the Workshop

Introduction of the team, ROBIN and the workshop

Stakeholders suggesting factors

Plenary: Presentation of one of the Fuzzy Cognitive Maps

Group photo of all participants in the first Mexican Workshop

7.3 Complementary materials from the first and second stakeholder workshops in Fiona Tapajos

7.3.1 Agenda of the Workshops

O Projeto ROBIN propõe

- A melhor compreensão do papel da biodiversidade na mitigação de mudanças climáticas;
- Informações para os formuladores de políticas públicas para subsidiar estratégias sustentáveis na Amazônia;
- Estratégias e ferramentas para a mitigação de mudanças climáticas;
- Avaliação dos riscos e incertezas associados com opções para a mitigação de mudanças climáticas.

A importância do workshop

Promover o diálogo das partes interessadas para discutir e trabalhar juntos em um entendimento comum dos problemas da região Amazônica;
Integrar conhecimentos sobre as políticas públicas voltadas ao desenvolvimento e sustentabilidade na Amazônia;
Fornecer interação entre o conhecimento local, socioeconômico, científico e político.

Programação

27.Nov.2013. Quinta-feira: cenário atual

8h30 - 9h	Boas vindas e registro dos participantes.
9h - 9h15	Apresentação dos participantes.
9h30 - 9h45	Início da reunião do Projeto ROBIN.
9h45 - 10h15	Panorama sobre a dinâmica de ocupação na Amazônia e a manutenção de áreas legalmente protegidas: Estudo de caso Flona Tapajós.
10h15 - 10h30	Como desenvolver mapas cognitivos, aplicação útil e prática.
10h30 - 11h	Coffee break
11h - 12h	Parte I: Identificação dos fatores responsáveis pela manutenção ou perda de biodiversidade na Amazônia.
12h30 - 13h30	Almoço
13h30 - 14h30	Parte 2: Explorando as relações entre os fatores identificados .
14h30 - 16h	Parte 3: A importância dos vínculos estabelecidos entre formadores de opinião na Amazônia.
16h - 16h30	Coffee break
16h30 - 17h15	Plenária: Apresentação e discussão dos mapas construídos por cada grupo.
17h15 - 17h30	Encerramento e entrega dos certificados.

28.Nov.2013. Sexta-feira: cenário futuro

8h30 - 9h	Rodada de conversa sobre a oficina do cenário atual
9h - 9h15	Aplicação da metodologia de percepção cognitiva para o cenário futuro
9h30 - 9h45	Dinâmica de integração entre as equipes.
9h45 - 12h	Percepção cognitiva do cenário futuro voltado ao desenvolvimento sustentável na Amazônia
12h30 - 13h30	Intervalo para almoço
13h30 - 15h30	Avaliação dos mapas elaborados pelas equipes
15h30 - 16h	Dinâmica de integração
16h00 - 16h30	Coffee break
16h30 - 17h15	Apresentação e discussão do cenário futuro
17h15 - 17h30	Encerramento e entrega dos certificados

Coordenação Técnica
Lucieta Guerreiro Martorano
Margareth Simões

Coordenação Logística
Delma Lúcia Campos

Equipe Técnica
Consuelo Varela
Irene Blanco
Lucas Mazzei
Raimundo Cosme de Oliveira
Paulo Fernandes
Socorro Ferreira
Rodrigo Demonte Ferroz
Marisol Toledo
Alda Mileo
Regina Teodosio
Edilvar Pimentel

Equipe de Apoio
Aline Barbosa
Sarah Batalha
Leila Lisboa
Muller Pimentel
Josiane Reis

7.3.2 Report of the Workshops

REPORT OF THE 1st and 2nd STAKEHOLDERS WORKSHOP IN SANTARÉM-AMAZONIA, BRAZIL

Date of the meeting: 27th and 28th November 2013

Place of the meeting: Santarem, Brazil
Pilot area: Tapajos National Forest (FLONA Tapajós)
Reporter (name/institution): Lucieta Guerreiro Martorano (Embrapa Eastern Amazon), Norma Ely Beltrão (UEPA), Eleneide Doff Sotta (Embrapa Amapa), Margareth Simões (Embrapa Soil), Socorro Ferreira (Embrapa Eastern Amazon)

(Based on the observers workshop reports and on the EMBRAPA team perceptions and expertise)

Facilitator (name/institution): Fábio Homério Diniz (Embrapa Dairy Cattle)

WORKSHOP DAY 1

1. Representation of different stakeholders

Table 15. List of participants at first stakeholder workshop in Flona Tapjós.

Name (acronyms names)	Organisation/ profession	Position /affiliation	Gender (M/F)	Age*	Participation in workshop	Any other relevant comments
University Student (B.Sc)	Embrapa Eastern Amazon		F		X	
University professor	UFOPA		F		X	
*Univer*sity professor (international partner)	UNIV. POLITECNICA DE MADRID		F		X	
Representative Federal Government Agency	ICMBIO		M		X	
Agricultural technician	Embrapa Eastern Amazon		M		X	
Representative federal government Agency	MAPA		M		X	
Agricultural Researcher	EMBRAPA AMAPA		F		X	
University Student (M.Sc)	LBA		F		X	
Moderator	Embrapa Dairy Cattle		M		X	
Agricultural Researcher	EMBRAPA RORAIMA		M			
University professor (international partner)	UNIV. POLITECNICA DE MADRID		F		X	
Representative Federal Government Agency	ICMBIO		F		X	
Project colaborator	Embrapa Eastern Amazon		M		X	
Representative Federal Government Agency	ICMBIO		F		1^{ST} Day	
University professor	WAGENINGEN UNIVERSITY		M		X	

(international partner)						
Representative Federal Government Agency	IESPES		F		X	
University Student (D. Sc.)	ESALQ-USP		F		X	
University Student (M.Sc.)	UEPA-PPGCA		F		1st and 3th Day	
Agricultural Researcher	Embrapa Eastern Amazon		F		X	
Agricultural Researcher	Embrapa Soils		F		X	
Technical support	CINEMATOGRAFISTA		M		X	
University Student (D.Sc.- international partner)	UNIVER. AUSTRIA/ROBIN		M		X	
Community representative	FLONA TAPAJOS/COMUNIDADE DO MAGUARI		M			
Representative Federal Government Agency	MAPA-SFA-PA		M		X	
Agricultural Enterpreneur of Soybean production	SIRSAN		M		X	
Agricultural Researcher	EMBRAPA AMAZÔNIA ORIENTAL		M		1st Day	
Community representative	FLONA TAPAJOS		M		X	
Agricultural Researcher	EMBRAPA SOLOS		M		X	
Professor	FIT		F		1st Day	
Professor	UFOPA		M		1st and 2sd Day	
University Student (M.Sc)	UEPA-PPGCA		F		1st and 3th Day	
Agricultural extensionist	EMATER-BELTERRA		M		X	
NGO representative	TNC		F		X	
NGO representative	IARA		M		X	

* Age – was not requested

1.1) Were all stakeholders represented?

Who was missing? Why?

The main decision makers were represented. Some of them could not be present the whole event due to their agenda.

Two representatives of the Tapajós National Forest Communities residents attended and actively participated in the discussions in the plenary and in the working groups. The representative of the Ministry of Agriculture, only participated in the first day, given his other agendas in Brasilia. However, he expressed in the Plenary his satisfaction in having participated in the technical discussions, and regretted not being able to participate by the end. He also expressed interest in attending similar meetings, due to the great experiencie in the Workshop. A similar statement was given by two teachers and a representative of CONFLONA who can not attend the second day of the meetings, because they also had other agendas.

1.2) Describe shortly how you invited participants.

By letter, by phone, both? (Please include the invitation letter to this report)

How did you identify the persons to be invited?

They were identified by their position and role in the regional development process.

There were invited representatives of communities, soybean farmers, the rural extension agencies, environmental inspection agencies, educational and research institutions in the public and private sector, cooperative forest management in the Tapajós National Forest, the Supervisory Board in Agriculture, NGOs, local representative of both environmental planning as tourism, in addition to students and researchers working within the ROBIN Project.

Was it easy to get these people interested?

Yes, because the workshop theme was very attractive being of great interest in Brazil and especially in the Amazon.

Did they indicate their reason for participating/not participating? If so, what was the reason?

All participants were aware of the importance of their participation. Some of them were proud of taking part of the process.

2. Atmosphere in the beginning

2.1) Was a good atmosphere established?

The atmosphere was good because all the participants could understand from the beginning that they were taking part of an important project for the region. All participants were informed about what would be developed during the workshop and the importance of their participation for the good result of the event. To introduce the participants to the project the event started with the presentation of the project by the international and Brazilian leaderships in an interactive way.

2.2) Did you do something to encourage a good atmosphere?

A brainstorming technique was used to encourage all participants to interact and to present their ideas about the regional development.

3. Discussion on the main issues related to the state of the natural environment in the Pilot Area

Please send the outcome of the discussion-

3.1) What kind of discussions took place?

Before the division by working groups, the workshop organizing team asked everyone:

In your opinion what factors have influenced the current state of Amazonia in areas with forest and its surroundings?

In the brainstorming process several factors were addressed such as deforestation of the Amazon forest, agricultural expansion, especially in the state of Pará, increased immigration of farmers from South, Southeast and Midwest regions of Brazil, high supply of arable land and low financial cost to acquire plots in the Amazon, the land issue regulations, garbage in rivers, lack of access to agricultural incentive programs, low income assistance programs should be more efficient in its managing, and finally, the monitoring of the effective use of governmental financial resources offered to the small farmers, among others.

Who supported, who criticised different views presented?

The local stakeholders (from forest and communities) gave the greater support to the discussion of the socioeconomic and environmental aspects of the natural resources protection in Amazon. While the ONG representant critised the lack of governmental interest to solve these problems.

What kind of reasons for support/criticism was presented?

The reasons include the non application of the existent environmental laws, that could avoid and prevent many of the current problems.

Whose input was decisive in that discussion? Whose was not

3.2) Was there place for experience-based knowledge as well as for scientific knowledge?

Yes, at the moment of the brainstorming process, people made their statements about their experiences, illustrating each aspect presented.

3.3) Were there diverging views on the past changes? Fill in the following table.

Tick here	*Please choose <u>one</u> of the following assertions that in your opinion describes the degree of **divergence of views.** Please read all options before choosing one.*
	There wasn't any divergence at all.
	There was very little divergence.
X	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the issues and discussing about them required a lot of time.
	None of the above. Better description is:

4. Mapping main issues (card technique)

4.1) What issues did different stakeholders identify? Did you ask them to identify 'problems', or more neutrally just 'issues'?

The problems were raised from the initial information provided during the explanations.

4.2) What were the reactions to presented issues?

Who supported, who criticised different views presented?

The discussions resulted into different points of view, but with a consensus about the biodiversity conservation in Amazon.

What kind of reasons for support/criticism was presented?

Given the socioeconomic and ecological awareness of the participants, there were a worry about the biodiversity conservation and its importance for the maintenance of their activities in the region.

4.3) Were there diverging views on the main issues discussed in this workshop?

Tick here	*Please choose <u>one</u> of the following assertions that in your opinion describes the degree of **divergence on views of the main issues.** Please read all options before choosing one.*
	There wasn't any divergence at all.
	There was very little divergence.
	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the main problems and discussing about them required a lot of time.
X	None of the above. Better description is: There was a general divergence of the Amazon Participants regarding the proposal of a future scenario which did not represent the reality of the region. After that, the exercise was reformulated in order to represent the Amazon reality.

4.4) Did you find the presented issues surprising? Why, why not? (relate to the discussion and results of the preparatory workshop?

Yes, to some extent. Most of the presented issues were expected given the prior interaction we had with local people and the awareness about the local conditions.

4.5) How were the identified problems linked/clustered together?

Who got to decide about the linkages?

All participants in the groups have contributed to decide about the linkages and the coordinators of ROBIN project, supported the moderator when there was some diversion.

Whose input was decisive in that discussion?

One aspect that has been a matter of discussion was regarding the lack of the public governance regarding the appropriate use of natural resources. Another important factor, reasoned by the representatives of communities living in the Tapajós Flona, the wish to be heard, because "just those who live in the forest know what to request from the government" and from other partners.

Which issues were left alone?

A subject that was not much discussed was the safety in urban and rural areas.

4.6) Were any unexpected linkages between different issues formed?

One aspect that was raised was the environmental injustice, ie, poor populations are most affected by disasters, being socially disadvantaged, especially women, children, disabled and elderly.

4.7) Methodological aspects of Card technique

Was it easy to name the issues by each participant

Yes, most of the participants could name at least one issue because they were feeling comfortable with the topic. It was also easy to introduce the issues, because the organizers knew the technique very well.

Was it easy/hard to find clusters of the issues?

It was generally easy to find clusters, because many named issues were somehow related. The organization in clusters was successful within the timeframe established and the goal oriented groups. While performing the cluster, new arrangements were collected for clustering and problems were being regrouped to find the best cluster organization.

Did new issues arise while clustering?

Yes, some new issues aroused while clustering, but that was not frequent. That only happened when the groups encountered a very important issue that was not named before.

5. FCMs of the present

Please include pictures of the FCMs.- Already done, thank you, not needed

5.1) How did you organise the FCM session?

In different groups? How many?

Two groups were used, with a moderator and methodology instructor.

What were the criteria to group people?

The groups were formed taking into account the balance among of the availability and multidiciplinary of the participants' knowledge; It was also a tentative of keeping an equilibrium in number of participants and their background.

Please give a list of participants to different groups and name or number of the group.-This is very important, please, complete this part carefully

	Name	Organisation/ profession	Group
1	University Student (B.Sc.)	EMBRAPA EASTERN AMAZON	1
2	Community representantive	FLONA TAPAJOS/COMUNIDADE DO MAGUARI	2
3	University Professor	UFOPA	1
4	University Professor (International partner)	UNIV. POLITECNICA DE MADRID	2
5	Representative of Federal Government Agency	ICMBIO	1
6	Agricultural researcher	EMBRAPA EASTERN AMAZON	1
7	Representative of Federal Government Agency	MAPA	1
8	Agricultural researcher	EMBRAPA AMAPA	2
9	University Student (M.Sc.)	LBA	1
10	Moderator	EMBRAPA DAIRY CATTLE	2
11	Agricultural researcher	EMBRAPA RORAIMA	2
12	University Professor (International partner)	UNIV. POLITECNICA DE MADRID	1
13	Project colaborator	EMBRAPA EASTERN AMAZON	2
14	University Professor (International partner)	WAGENINGEN UNIVERSITY	2
15	University Student (D.Sc.)	ESALQ-USP	1
16	University Student (M.Sc.)	UEPA-PPGCA	2
17	Agricultural researcher	EMBRAPA EASTERN AMAZON	1
18	Agricultural researcher	EMBRAPA SOILS	2
19	Technical support	CINEMATOGRAFISTA	1 e 2, training
20	University Student (D.Sc. – International partner)	UNIVER. AUSTRIA/ROBIN	1 e 2, training
21	Agricultural Enterpreneur of Soybean production	SIRSAN	1
22	Agricultural researcher	FLONA TAPAJOS	1
23	Agricultural researcher	EMBRAPA SOILS	1
24	Professor	UFOPA	2
25	University Student (M.Sc.)	UEPA-PPGCA	2
26	Agricultural extensionist	EMATER-BELTERRA	2
27	NGO representantive	TNC	2
28	NGO representantive	IARA	1

5.2) What kind of discussions took place in the groups?

Who supported, who criticised different views presented?

The different sectors (government, non-government, private, traditional communities and farmers) were concerned with identifying the weaknesses threat to sustainable biodiversity in Amazonia. Despite philosophical differences there was always convergence to sustainable development for the region.

What kind of reasons for support/criticism was presented?

All discussions were focused on the factors that could contribute to the biodiversity maintenance or loss.

Who got to decide about the linkages and their weights?

The linkages were built by the group opinion and moderated by the instructors.

Whose input was decisive in that discussion? Whose was not?

Deforestation was the deciding factor while water pollution had little focus, this is a consequence of the large supply of water in the Amazon basin, but it can vary widely depending on the country region. It was mentioned by the agricultural extensionist, that regarding forest management, there are appropriate technologies, but they are of hard access to small farmers. There is also a lack of information, knowledge and training to adopt sustainable technologies in the urban and rural areas.

5.3) Were there diverging views on the FCMs produced in the groups? Fill in the following table(s).

Group 1

Tick here	*Please choose <u>one</u> of the following assertions that in your opinion describes the degree of **divergence of views in the group.** Please read all options before choosing one.*
	There wasn't any divergence at all.
x	There was very little divergence.
	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the issues and discussing about them required a lot of time.
	None of the above. Better description is:

Group 2

Tick here	*Please choose <u>one</u> of the following assertions that in your opinion describes the degree of **divergence of views in the group.** Please read all options before choosing one.*
	There wasn't any divergence at all.
x	There was very little divergence.
	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the issues and discussing about them required a lot of time.
	None of the above. Better description is:

5.4) What kind of knowledge were people bringing into the exercise? (any references to science; references to own experience in the field; references to the history of the region; etc.)

Most of the contribution was based on own experience and the knowledge of the history of the region.

5.5) Any signs in cognitive learning detected?

Learning new things about the pilot site or the region? Give examples.

5.6) Any signs of social learning detected?

Learning from each other? Give examples.

Learning as a result of discussions/debates with each other? Give examples.

Was common understanding of the problem detectable? Give examples.

5.7) How do the different FCM's relate to one another? Similar, different?

Both FCM's well represented the reality lived by the local people considering the social-economic problems and the difficulties related to the political will for changes.

In both FCM's deforestation was the main principal factor and was strongly related to lack of governmental coordination or lack of coordination and integration of ministries, which affected many other factors and drivers mentioned by each group.

5.8) What was the relationship between the identified issues and the final FCMs?

Which issues of the original ones were included?

Which were omitted

5.9) Methodological aspects

Was the use of FCM easy/hard for the participants?

It was easy for most participants, especially because there was a considerable part of the group that had already participated of similar activity.

Was the FCM helpful in stimulating system thinking (cognitive learning) and social learning (between different participants)

Very much

How were different kinds of knowledge handled during the process? (Different knowledge like science, practical knowledge, experience, etc.)

All knowledge was considered important and had a place in the FCM.

5.10) What kind of comments did the participants have? Who/what?

They commented that in the beginning some of them were reticent about participating once more in a meeting like that but at the end they recognised that it was a very useful exercise, and that they were glad they could have this opportunity.

6. End of the day 1 thoughts:

6.1) Who was most loud/ outspoken?

6.2) Who had the most convincing arguments (*'convincing' meaning s/he could convince others, not necessary convincing in your opinion*). Based on what knowledge, based on which arguments?

6.3) Who was not influencing?

6.4) Was different participants' input as expected?

Did participants present any unexpected comments?

Were the most resourceful/influential/dominant participants the ones you expected?

Did someone become unexpectedly influential?

6.5) How much did the 'experts' intervene? How much were they asked for help? (Experts like ROBIN people or other recognised as experts)

WORKSHOP DAY 2

7. Representation of different stakeholders

Table 16. List of participants at second stakeholder workshop in Flona Tapajós.

Name	**Organisation/ profession**	**Position /affiliation**	**Gender (M/F)**	**Age***	**Participation in workshop** (entire workshop/Only in sessions x,y,z)	**Any other relevant comments** (e.g. have been very active in the region, 'new face', ethnicity...)
University Student (B.Sc)	Embrapa Eastern Amazon		F		X	
University professor	UFOPA		F		X	
*Univer*sity professor (international partner)	UNIV. POLITECNICA DE MADRID		F		X	
Representative Federal Government Agency	ICMBIO		M		X	
Agricultural technician	Embrapa Eastern Amazon		M		X	
Representative federal government Agency	MAPA		M		X	
Agricultural Researcher	EMBRAPA AMAPA		F		X	
University Student (M.Sc)	LBA		F		X	
Moderator	Embrapa Dairy Cattle		M		X	
Agricultural Researcher	EMBRAPA RORAIMA		M			
University professor (international partner)	UNIV. POLITECNICA DE MADRID		F		X	
Project colaborator	Embrapa Eastern Amazon		M		X	
University professor (international partner)	WAGENINGEN UNIVERSITY		M		X	
Representative Federal Government	IESPES		F		X	

Agency						
University Student (D. Sc.)	ESALQ-USP		F		X	
Agricultural Researcher	Embrapa Eastern Amazon		F		X	
Agricultural Researcher	Embrapa Soils		F		X	
Technical support	CINEMATOGRAFISTA		M		X	
University Student (D.Sc.- international partner)	UNIVER. AUSTRIA/ROBIN		M		X	
Community representative	FLONA TAPAJOS/COMUNIDADE DO MAGUARI		M			
Representative Federal Government Agency	MAPA-SFA-PA		M		X	
Agricultural Enterpreneur of Soybean production	SIRSAN		M		X	
Community representative	FLONA TAPAJOS		M		X	
Agricultural Researcher	EMBRAPA SOLOS		M		X	
Professor	UFOPA		M		X	
Agricultural extensionist	EMATER-BELTERRA		M		X	
NGO representative	TNC		F		X	
NGO representative	IARA		M		X	

* Age – it is not been request

7.1) Were all stakeholders represented?

Who was missing? Why?

8. Introduction of ROBIN scenarios

8.1) How was information presented?

The scenarios were presented by one of the group participants to all participants, and after both were presented there was some time for commenting the scenarios.

8.2) What kind of comments did the participants have? Who/what?

8.3) Was the outcome understandable? How did participants find the scenario thinking?

- easy/hard
- useful/not useful
- facilitating free thinking/mind setter

Most of them found it useful and mind setter

9. Scenario development in groups- FCMs of the futur

Please include pictures of the FCMs.-

9.1) How did you organise the scenario building session?

In different groups? How many?

In one group

What was the criteria to group people?

It was decided to create only one scenario with the input of all participants in order to have enough time to conclude the work.

Please give a list of participants to different groups and name or number of the group.

9.2) What kind of discussions took place in the groups?

Who supported, who criticised different views presented?

What kind of reasons for support/criticism was presented?

Whose input was decisive in that discussion? Whose was not?

Dominantly members supported the views related to sustainable development.

The main criticism of most members was related to lack of monitoring and supervision of the Amazon floral and fauna.

The main reasons were weighted with respect to the existence of fires, deforestation of secondary forests, overfishing, hunting of birds for sales in markets in large cities such as Belém and Manaus.

9.3) Were there diverging views on the scenarios produced in the groups? Fill in the following table(s).

Tick here	*Please choose <u>one</u> of the following assertions that in your opinion describes the degree of **divergence of views in the group.** Please read all options before choosing one.*
	There wasn't any divergence at all.
	There was very little divergence.
	There was some divergence and we needed to lengthen discussions because of them.
	There were very divergent views on the issues and discussing about them required a lot of time.
X	None of the above. Better description is: There was only one group

9.4) What kind of knowledge were people bringing into the exercise?
Most of the contribution was based on own experience and the knowledge of the history of the region, but there were some interventions of participants with more scientific knowledge also.

9.5) Any signs in cognitive learning detected?
Learning new things about the region or the region? Give examples.

9.6) Any signs of social learning detected?
Learning from each other? Give examples.
Learning as a result of discussions/debates with each other? Give examples.
Was common understanding of the problem detectable? Give examples.

9.7) What was the relationship between the main issues identified in the beginning of Day 1 and the scenarios?

10. Presentation of scenarios and discussion (plenary)

10.1) What kind of discussions took place in the groups?
Who supported, who criticised different views presented?
What kind of reasons for support/criticism was presented?
Whose input was decisive in that discussion? Whose was not

Methodological aspects

- Was the scenario building easy/hard for the participants?

11. End of Day 2 thoughts:

11.1) Who was most loud/outspoken?

11.2) Who had the most convincing arguments (*'convincing' meaning s/he could convince others, not necessary convincing in your opinion*)
Based on what knowledge, based on which arguments?

11.3) Who was not influencing?

11.4) Was different participants' input as expected?
Did participants present any unexpected comments?
Were the most resourceful/influential/dominant participants the ones you expected?
Did someone become unexpectedly influential?

11.5) How much did the 'experts' intervene?
How much were they asked for help? (experts like ROBIN people or other recognised as experts)

<u>OTHER COMMENTS</u>:

12. General observation of the whole workshop

Your own impressions:

12.1) Do you think it went well?

12.2) Did it go how you had expected?

12.3) What went as according to your expectations?

12.4) What went contrary to your expectations?

12.5) What is your general feeling of how the workshop was designed/structured/carried out?

13. Participant satisfaction

13.1) How do you think participants felt about the workshop?

Many participants expressed their satisfaction in taking part of the workshop due to the several new knowledge and technical terms. The interaction among the participants was also very positive, they were thankful by the invitation and opportunity to express their opinions and worries about the growing loss of natural resources.

13.2) Atmosphere

Report mood-o-meter results

Was general atmosphere throughout meeting constant, or did it change a lot?

In general, would you say it was enthusiastic/neutral/reluctant?

13.3) Methodological aspects

How did you carry out the mood-o-meter exercise?

Did it work?

Any suggestions for improving the technique? How would you do it differently in the future?

14. General observation during the workshop

14.1) Did discussion flow well and naturally, or was facilitation and motivation required much of the time?

It flowed well, given the initial presentation that clarified all main issues, ROBIN project status and workshop objectives.

14.2) In general, do you feel participants voiced their true opinion/viewpoints?

Absolutely.

14.3) Were they given enough opportunity to voice their true opinion/viewpoint?

Yes, all had opportunity to express their opinion and viewpoint through the plenary debates and working groups.

14.4) Did participants listen to each other well?

Yes, because they thought relevant all opinions.

15. General observation during breaks

15.1) Any clear 'groups' formed?

No, there weren´t any clear groups because the participants interacted very well among others.

15.2) Who was talking with whom?

Amazon stakeholders and those from other localities, including other Brazilian states and nationalities.

16. Feedback

16.1) Apart from the feedback questionnaire (sent and processed separately from this report- what kind of feedback did the participants give?

17. Any final thoughts?

17.1) What could you suggest for improving the workshops in the future?

Increase the number of stakeholders and social participation (at least 50 participants) focused on the sustainable development of Amazon.

17.2) Anything in particular you would add/remove/change?

Add new relevant and representative groups.

17.3) What about the process of observing/recording/reporting/interviewing/ doing questionnaires…?

These processes were important to document all aspects of the workshop in order to be used in other meetings and projects.

17.4) Any other comments/thoughts?

The methods of obtaining perceptions were very important in defining strategies involving all stakeholders opinions and experiences by sharing their expertise.

7.3.3 Feedback analysis

This section offers a more in-depth review of the responses given by stakeholders at the end of the workshops. Stakeholders were asked a range of questions that related to the inclusivity, efficacy and utility of the workshops from their own perspective. All values that are quotes within the brief analysis relate to the corresponding figure.

7.3.3.1 First Workshop

Figure 55 demonstrates that In terms of whether participants agreed that other stakeholders were able to express their opinions, 45% of respondents stated that they agreed with this, with the other 55% stating that they partially agreed. The level of agreement rose to 61% when participants were asked whether they believed that their own opinions were considered, with 10% disagreeing and stating that they did not believe that their opinions were considered. 82% of stakeholders completely agreed that the workshop met their expectations.

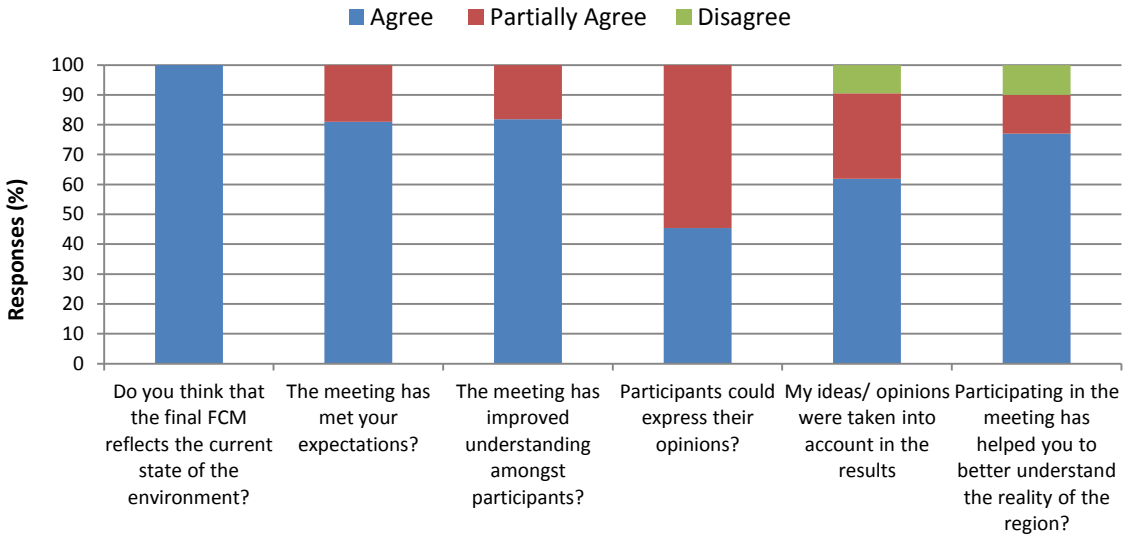


Figure 55. Stakeholder responses to a questionnaire reviewing their experiences of the first workshop in Flona Tapajós.

The general success of the methodology and of those implementing it during the workshop can be seen by the stakeholder's responses to the questions relating to whether the workshop has improved their understanding of the problems associated with the area (77%), and whether the FCM developed during the workshop reflects the current reality of the environment (100%). It should not however be ignored that 10% of respondents stated that participating in the meeting did not help them in their understanding of the region.

7.3.3.2 Second Workshop

The responses related to the second workshop follow a similar pattern to that of the first. In terms of participants being able to express their opinions, and whether participants felt their opinions were considered in the final results we can see similar patterns, with 60% (Figure 56) stating that fully agreed that they could express their opinions, and 70% stating that they agreed that their opinions were considered, with 4% stating that they did not feel their opinions were considered. Concerning whether expectations were met, only 64% stated that this was the case, down from over 80% in the first workshop.

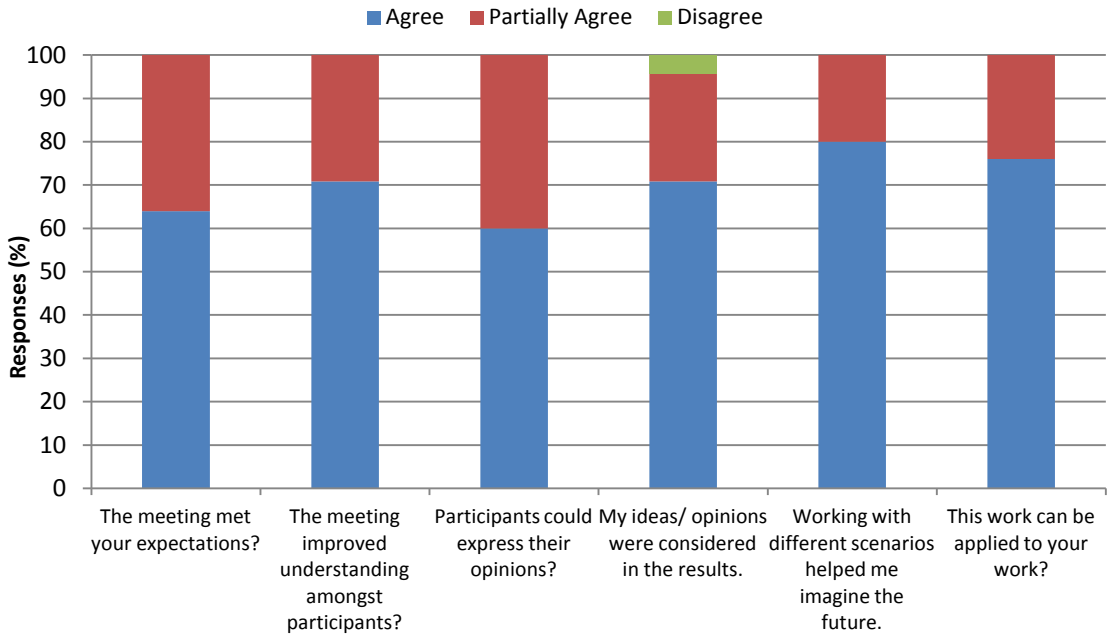


Figure 56. Stakeholder responses to a questionnaire reviewing their experiences of the second workshop in Flona Tapajós.

The utility of the workshop and the methodology used within it can be seen in the responses from the stakeholders, with 71% of respondents stating that the meeting improved the understanding of the participants. In relation to working with scenarios, 80% stated that working with these during the workshop helped them in imagining the future. Overall, one could say that the workshop was a success with all questions asked receiving a positive response level above 60%, with only one question-consideration of opinions-receiving a negative response.

The following is a brief summary of the analysis of the workshop offered by the moderator of the workshops. The first workshop in Flona Tapajos was exceedingly

successful, with a range of stakeholders participating and contributing to the formation of the conceptual models. Despite the variety of stakeholders present, there was unanimous desire to identify threats to biodiversity in the Amazon. In spite of philosophical differences in the means of achieving it, there was also a general want for sustainable development within the region. There was very little divergence in the views of the stakeholders within either of the groups, all participants knew the scale of the issues and contributed to the discussion through experience and extensive knowledge of the region. From a methodological perspective, there were very few problems with stakeholders in understanding the workings of producing conceptual models. It was easy for a large number of participants, due to a large proportion of them having been involved in similar workshops previously. The methodology was very useful in aiding participants in cognitive and social learning throughout the workshop.

7.3.4 Pictures of the Workshops

Stakeholder introductions

Discussing factors of change in the area

Considering the relationships between factors

Plenary: Presentation of one of the FCMs

Stakeholders and facilitators of the workshop in Flona Tapajós