Workshop Proceedings: Climate Scenarios for the Planning and Management of the Manuripi Reserve

SERNAP - Manuripi National Wildlife Reserve. WWF Bolivia - October 2017

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Workshop Proceedings:
Climate Scenarios for the Planning and Management of the National Wildlife Reserve Amazon Manuripi

Event promoted by the Manuripi National Wildlife Reserve (RNVSAM), the Research and Production Center for the Amazon of the University Pando Amazon (CIPA-UAP) and World Wildlife Fund. Inc. (WWF Bolivia)

Postgraduate University Campus,
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1. Context

The phenomenon of climate change represents, widespread, a threat to protected areas, mainly in the sense of limiting the conservation of the cultural and natural heritage mission. The scenarios and forecasts of climate change, it determines the frequency, intensity of atmospheric conditions and also the changes in climatic phenomena in general, thus inquiry and threat the current management models of protected areas, including territorial management and natural resource management as fundamental elements.

Facing already with the real eventuality of these changes, it is necessary to analyze, reflect and incorporate the variable of climate change in the management of protected areas, so that they can reduce the risk at the time of fulfilling and performing their role in conservation. of natural and cultural heritage. But at the same time protected areas are an opportunity to contribute and provide natural solutions to climate change, which can be applied in other territorial units.

The Manuripi National Wildlife Reserve is a unique protected area, whose social, environmental and economic sustainability is linked to a great opportunity, referred to the management and use of their wild resources including the Brazilian nut and Asai, wild products considered within the 10 best foods of the world, but also with high and considerable productive and economic potential. However, last years has been there were a crisis in the production of Brazilian nut, generating a widespread concern that in many cases has been attributed to different causes, including climate change, mainly changes of the hydrologic regime, specially in the frequency of precipitation.

Aware of this reality, WWF Bolivia created an alliance with Columbia University - Center for Climate Systems Research (CCSR), with the objective to analyze climate risk scenarios in the Manuripi and Madre de Dios watersheds, in order to provide inputs and scientific information, so can be incorporated into the planning of the protected area, through its management instruments (e.g. Management Plan, Protection Plan, Monitoring Plan, among others), so the climate change analysis will allow the stakeholders to develop strategic guidelines for mitigation and adaptation.

The results of the analysis of the climatic scenarios generated by the Columbia University were presented to other specialists and to the local and institutional actors related to the Manuripi National Wildlife Reserve in the Workshop: "Climatic scenarios for the planning and management of the Manuripi Reserve" at the Cobija city (Pando, Bolivia), in order to reflect and generate discussions related to the effects of climatic variability linked to people's livelihoods, within the framework of articulation to the new Comprehensive State Planning System, whose horizon is the construction of living well through integral development in harmony with Mother Earth.

2. Purpose of the workshop

The purpose of the workshop was to carry out a first approach to the topic of climate change to generate inputs that complement the planning and management instruments of the Manuripi National Wildlife Reserve.

3. Objectives

- To present and discuss the scenarios and climate risks in the Manuripi and Madre de Dios Basins, as a result of the modeling carried out by the Climate Systems Research Center of Columbia University.

- Analysis of the scenarios and climate risks by local and institutional actors.
- Generate proposals for national and regional actions and strategies to be incorporated into the strategic planning and management of the protected area

4. The workshop

The first part, focused on different expositions by institutional actors that have been contributing in the management of the Manuripi Reserve, this set of exhibitions had the purpose to contextualize the advances, problems and limitations, and challenge of the protected area, including the presentation of climate risk scenarios.

The second part focused on group analysis by the social and institutional actors, in order to identify climatic risks, future climate scenarios, impacts on the management of natural resources, the territory and the possible adaptation measures for climate change, specially those mainly associated with the Brazilian nut production and harvest. Part of this analysis included the identification of short, medium and long-term actions that could be included in the strategic planning instruments of the Protected Area.

4.1 Advances in the management of the Manuripi Reserve and its relationship with the use of the Brazilian nut (*Bertholletia excelsa*). Víctor García – WWF

The Manuripi Reserve was created in 1973, is located in the Department of Pando-Bolivia and has an area of 747,000 hectares, of which 400,000 are under Brazilian nut harvest and production. The main objectives of the creation of the national wildlife reserve are: to conserve and protect the most representative samples of the Amazonian forest of the country and to promote the sustainable use of wild resources, improving the quality of life of local actors, and contributing to local and regional development.
The management of the Reserve began in 1999, with the construction of field camps. In 2005 started the Brazilian nut management activities, taking an important step in the management of the Protected Area, Brazilian nut management plans were prepared in 5 communities and 20 barracks (Private Owners Areas), prioritizing the social participation. Later in 2007, the Regulation norms for the control of the Brazilian nut harvest were defined, and that was one of the most important milestones when these rules were approved. In 2008, the Management Committee was formed with local and institutional stakeholders, while in 2012 the stamp of differentiation was created as "Seal of Origin" that grants identity and belonging to the Brazilian nut of the Manuripi Reserve, that allows to look for niches of preferential marketing market recognizing its conservation and social responsibility value.

Starting 2012, financial sustainability mechanisms are implemented that contribute to the integral management of the Protected Area.
After 17 years of work, SERNAP consolidated the institutional presence with equipment, infrastructure and permanent staff, as well as generating management tools such as the Management, Protection and Financial Sustainability Plans, and in the productive area the management of Brazilian nut as a strategic resource through management plans, harvesting regulations, seal of origin, monitoring of the production activity, organic certification, commercialization and generation of their own income that give technical and financial sustainability to the management of the protected area.
Manuripi has advanced a lot in these 17 years, in short term it has been possible to develop innovative and successful processes for all the Protected Areas, SERNAP has the opportunity in Manuripi to generate a different and unique management model, although there are still many challenges, they have taken very important steps that will be key to the future of this Protected Area

4.2 Results of the Brazilian Nut Conversation Meeting (Gustavo Mariaca / ACEAA)

The meeting has brought together a set of institutional, academic, public and private agents and stakeholders (CIPA-UAP, ACBN-UAP, Postgraduate UAP, UAGRM, UFACPZ, WHRC-UFAC, ABT, GIZ-AIRAD, ACEAA, WWF-Bolivia, FAO , CIPCA, IBIF), with the purpose of analyze the monitoring and research needs related to Brazilian nuts and generate an academic discussion space in relation to the low production of Brazil nuts from the 2016-2017 harvest, and to create an inter-institutional platform in order to identify concurrent actions that make viable the research and information management of the Brazil nut and the factors that determine or affect its production.

The main meeting results shows that there are information about the Brazil nut, but it is scattered and is still insufficient. Based on this, an interinstitutional agenda of concurrent collaboration was generated, this agenda includes priority research topics; the management of information through an institutional platform that centralize information; the articulation and the concurrence of institutions.

4.3 Social economic impact for peasant families in relation to Brazil nut production (Gilda Ticona / CIPCA)

The Brazil nut is distributed in the department of Pando, the North of Beni (Province Vaca Diez) and North of La Paz (Iturralde Province). The estimate of the productive potential is high in the municipalities of Sena, Filadelfia and Puerto Rico, housing more than 50% of the Brazil nut, this productive potential is part of the family income of the local population of North Amazon, because exports of non-timber forest products have increased in relation to timber forest products. Despite the decrease in production volumes, the price of Brazil nut exports has increased by approximately 12%, which has compensated the fall in the general production of Brazil nuts in all the municipalities of Pando and Beni.

As CIPCA has been accompanied and facilitated the organization of the brazil nut sectors at the time of the crisis of the production, forming the Coordinator for the Integral Development of the Amazon (CoProDIAB) from this network proposals have been developed to counteract the effects in the fall of brazil nut production in the different municipalities. Proposals for adaptation and mitigation involve avoiding deforestation, promoting productive diversification, and the repopulation of brazil nut.

4.4 Climate, climate change and risk management of Brazil nut (Foster Brown, WHRC / UFAC)

Brazil nut production is in function of several factors, including Eco physiological factors, water availability, nutrient availability, evapotranspiration, carbon dioxide, pollinators, temperature, solar radiation, rain and others. Meteorologically the rains have dropped more than the average and therefore the agricultural production in general is affected, the rivers and water bodies (hydrologic conditions) have diminished more than the normal and all this has affected socioeconomically to the human population. The meteorological information shows that the deficit of the rains and the evapotranspiration have increased, prolonging the dry periods in the Amazon of Bolivia and Brazil in general. These dry seasons, together with some other associated phenomena such as the case of forest fires, increase the threats and the degree of transformation of the Amazonian forests. Although extreme events, among them fires, have existed in the Amazon, during the last few years they have been increasing as a result of the accentuation of the drought and the increase in temperature.

Information on extrapolation and climate modeling show that temperatures will increase throughout the Amazon, especially for the Cobija region, there is a gradual but rapid increase, showing higher predicted values in comparison with the normal values for the year 2019.

4.5 Modeling of the potential distribution of Brazil nut in Bolivia (Carlos de Ugarte / ACEAA)

According to the historical information of the Brazil nut tree at Bolivia, it mentions that is distributed in the Amazonian north, covering an area of 100,000 km2, which implies an area of 9% of the country. On this surface, there are approximately 17 million trees, with a density of 1.7 trees / hectare. Using Brazil nut georeferenced secondary information, the use of the Maxent modeling algorithm and the review and analysis by botanical specialists, we were able to model the potential distribution of Brazil nut in Bolivia. We have used 19 bioclimatic variables from Worldclim, a digital elevation model of 90 m, the biomass map generated by the Woods Hole Research Center (WHRC) and the Global Map of ecoregions proposed by Olson et al, 2001. The results show that the brazil nut distribution covers 84,000 km2, in the north. The surface obtained in the modeling is 16% less than the area mentioned in the historical data.

4.6 Climate change scenarios (Radley Horton / Columbia University, Ryan Barlett / WWF -US)

WWF and Columbia University have been collaborating for many years in more than 7 countries, promoting the generation of a new model to build a model of climate resilience through the "cogeneration" of adapted information on climate risk and its incorporation into planning, public policies and conservation and development practices in different countries. The model goes through the joint recognition of "5 key messages" which are: 1) Climate and climate change are not the same, 2) Climate change is happening, 3) Climate change means more extremes, 4) It is very probably an increase in temperature of 2 ° C in the global average and 5) We need to adapt now.

These five messages are synergistic and generally fall in the mode and time of adaptation, the ability to adapt to climate change reduces with the increase in temperature and is generally reduced to a minimum if the temperature rises beyond 2 ° C., as the predictive models shows.

In these situations, it is important to create models of resilience to climate change from the participation of the different stakeholders and include them in conservation and development policies and practices.

According to the modeling, different climatic scenarios have been generated, of which the scenario with the highest risk for Cobija is "much warmer days, temperatures increase to 3 ° C between September and October. Much longer periods of drought, reduction of total precipitation decreases by 30%, rains occur irregularly, infrequently and intensely as heavy downpours "

Session 1:
Analysis of the climatic calendar and extreme events

To carry out this analysis, the group of local and institutional stakeholders described the current climate (rainy season and dry season) in a monthly time line, from January to December. With color cards, they specifically described the months in which the wet season and dry season began and end, extreme events (floods and droughts) were also described if they existed. To this description, it was added, with cards of other colors, the activities carried out in the forest by the locals in the different months (e.g. start of the harvest: brazil nut, asaí, agriculture, fishing, etc.). Finally, the group was asked what would be the variations in the current calendar if there is a variation in climate? The intention of this question was to know if within the group exists or has defined the changes in the activities

of management of natural resources. Although the stakeholders (social and institutional) of the group are aware that a change in climate will generate changes in the benefits offered by the Amazonian forests, it has not yet been possible to determine in which specific way the changes would be generated.

Session 2:
Describing ecosystems and climate change scenarios

In this dynamic, both social and institutional stakeholders were asked, separately, to display in a drawing the ecosystem inside the Manuripi Reserve, as it is currently visualized. Subsequently, once the drawing was finished, the climatic scenario closest to the regional context of Cobija was inserted in the near future. This scenario described: "Much hotter days, temperatures rise to 3 ° C between September and October. Much longer periods of drought, reduction of total precipitation decreases by 30%, rains occur irregularly and infrequently and intensely as strong downpours ". Under this scenario, the actors were asked to visualize the changes that would occur in the ecosystem, taking into account the previous drawing.
Under the proposed scenario, some important impacts were identified, among which are: 1) Loss of navigation for at least 6 months; 2) Fall of brazil nut production by at least 70 and 90%; 3) Low production of food crops; 4) Asai production drop; 5) Cutting and interruption of roadways; 6) Decrease in tourism; 7) Death of animals due to droughts and floods 8) increase in forest fires; 9) Alteration of reproductive cycles; 10) Increase in tropical diseases; 11) Invasion of wildlife to crops; 12) Tree death; 13) Increase in pests and diseases; 14) Greater pressure on the forest, 15) Migration of people.

Session 3:
Generating resilience according the scenarios to climate change

Finally, in this session both the social and institutional stakeholders identified actions and guidelines for short, medium and long term that can be included in the strategic planning instruments (Management Plan, Protection Plan, among others) of the Manuripi Reserve in order to counteract the effects of climate change, mainly on the activity of the brazil nut harvest because it is the priority activity for the population in socio-economic terms. For this, the following guide questions were applied:
What actions or guidelines (short, medium and long term) can be included in the Management Plan to address current and future climate risks?
What immediate actions can be taken to counteract the effects of climate change on brazil nut production and harvesting? The analysis, in this session, allowed the identification of some specific actions in terms of generating measures to adapt to climate change. Among the proposed strategic guidelines are:
1. Design and implementation of an Environmental Education Plan on climate change.
2. Planning and implementation of a Contingency Plan for natural disasters.
3. Design of a forest enrichment plan with brazil nut.
4. Contingency plan for the attention of forest fires.
5. Diversification of wild non-timber forest products and under Agroforestry Systems.
6. Development of research topics on climate change.
7. Training of leaders in knowledge of climate change.

5. Conclusions.

The workshop generated a series of important conclusions to advance with the construction of resilience for the effects of climate change.

1. The generation of strategic alliances between institutions such as CIPA-University of Pando, SERNAP, WWF, Columbia University, UFAC, UMSS, ACEAA, CIPCA and other institutions working in the region with local actors, show an opportunity to promote adaptation actions to the effects of climate change in the northern Amazon region.

2. The workshop and its results, added to the efforts made in the discussion of the brazil nut meeting and its proposals, determine the specific institutional agenda on the immediate, important and urgent actions to be taken to counteract the effects of climate change on production of the brazil nut in the Amazonian north.

3. It is urgent to include the variable of climate change in the planning and generation of planning instruments for the protected areas of Bolivia, associated with the incorporation of the new planning guidelines established by the State with the promulgation of Law 777 of the System of Integral Planning of the State - SPIE.

4. The local construction, through the social and institutional actors that are present and associated with the Manuripi National Wildlife Reserve, has allowed to identify the climatic risks and the most important environmental impacts in the protected area. Among those that are:

1) Lost navigation for at least 6 months;
2) Reduction of brazil nut production from 40 to 70%;
3) Affectation to subsistence crops;
4) Alteration of the production of Asai;
5) Interruption of the roads;
6) Decrease in tourism;
7) Death of animals due to droughts and floods
8) Increase in forest fires;
9) Alteration of reproductive cycles;
10) Increase in tropical diseases;
11) Invasion of wildlife to crops;
12) Tree death;
13) Increase in pests and diseases;
14) Greater pressure on the forest,
15) Migration of people.

5. Based on local construction, it has been possible to propose actions to be implemented in the short, medium and long term specifically for the brazil nut harvest activity, but also for incorporation into strategic planning instruments.

6. In general, both social and institutional stakeholders conclude and agree that a large part of the impacts are being generated by climate change. However, the information to be able to determine the direct and specific effects or factors related to climate change is very limited, so it is necessary and urgent through the academy to implement research actions related to the factors and effects generated by the climate change.

With the participation of all, a place in the Amazon is being preserved ...
Manuripi National Wildlife Reserve.

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