Improving Adaptive Capacity through Open Collaborative Science and Landscape Governance: A Case Study in Two Model Forests

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1. **Executive Summary**

The goal and objectives of the project, as stated in the original proposal (December 2014) were as follow:

Overarching goal:

· Contribute to improving the adaptive capacity of interconnected socio-ecological systems and to enhancing climate governance at the landscape-level through the transformative participation of citizens in scientific debates, research agenda-setting, data interpretation and use, and knowledge production in relation with climate change.

Main objectives:

Improve decision-making and governance in relation to climate change within Model Forests:

- § Create awareness concerning anthropogenic climate change issues and provide capacity-building to stakeholders representing different sectors within the landscape.
- § Increase understanding and uptake of climate data and its usefulness to improve decision-making. Give the communities the tools to engage in analysis in order to deal with grand challenges such as climate change.
- § Stimulate the stakeholders to establish concrete strategies at different scales and levels: parcels, sectors, communities, territories.

Promote an environment conducive to open practices among citizens and the scientific community:

- § Establish an interactive relationship between scientists and Model Forest stakeholders.
- § Define the essential conditions and ingredients for a meaningful and successful OCS process, including behaviors and attitudes, governance architecture, role of leadership, methodology, etc.
- § Stimulate the participation of a diverse range of Model Forest stakeholders in further climate change research and monitoring.
- § Contribute to the understanding of the dynamics of collaboration and participation among actors with different perspectives and needs.
- § Assess the potential of particular adaptation measures designed and implemented by non-experts and compare with the relevant scientific literature.
- § Gather insights regarding the enabling conditions, barriers, attitudes, impacts, etc. related to OCS by comparing the process in both Model Forests to identify key variations

Major adjustments:

There has been some adjustments to the proposal, mainly in terms of redefining some of the outputs of the project in order to achieve the desired outcomes. These have been submitted to the OCSDNet coordination team in an update paper in December 2015, exactly one year after

the original proposal was presented. The adjustments were mostly connected to another project which was going to be a major "partner" project, but did not get its funding renewed as expected. The raw data coming from this project was also not as useful as expected.

These adjustments had two major consequences on our project: 1. We are not focusing so much anymore on the uptake of climate data per se and more on a broader capacity-building and knowledge-exchange component; 2. We are giving more room to the communities for deciding about their priorities and needs, which has been an extremely positive aspect and has triggered interesting local initiatives. All of the above highlights the importance of flexibility in the design of development projects – especially when it comes to working with people.

Emerging findings

So far, the project had several interesting outcomes. For example, one of the local communities got organized and even recently created its own new Foundation called "Fundación Red Agroecológica Villa de los Guayacanes" in Belen de Umbria, Colombia. Another community group in Villamills, Costa Rica got so motivated that it seek out the volunteer services of a teacher to improve their computer and oral presentation skills in order to be able to give better presentations, considering the local tourism initiative they want to set up. In total, seven local projects are underway which means we have seven local groups who are highly motivated.

Nevertheless, we have had less success in engaging certain communities and scientists, since the perceived benefits are quite low for such a high-involvement process. Indeed, those who are already engaged in organized groups and platforms have been more eager to participate and the most enthusiastic about the project. The community groups and people engaged within the project are typically leaders in their communities. On the other hand, poorer marginalized groups have more urgent priorities and would require a different process, which falls outside of the scope of our project. We aim at being inclusive, but people are still responsible for their own empowerment.

Finally other emerging findings are connected to the comparison between both processes in Colombia and Costa Rica, in terms of academic and institutional support, activities developed during the workshops, etc. For example, participants in both Model Forests have shown a keen interest in sharing local expertise with scientists but also in receiving the results of relevant studies in a friendly format.

2. Research Problem

Within the project, we are addressing a number of questions such as

- How can we involve rural communities and citizens in climate change research? How can we motivate citizens/communities to participate more in research agenda-setting and/or data production and analysis? What are the incentives?
- What specific aspects of the research process concerning climate change can be opened up further?
- Are the Model Forest platforms – as a process, a philosophy and an institutional context

– conducive to opening up the research process?
- What are the main barriers to overcome for the adoption of OCS practices by the academic community and the civil society?
- What is the potential of small-scale initiatives and of each of the strategies implemented by the stakeholders to trigger interest within communities and to be replicated at a larger scale, therefore having an "aggregate" effect in tackling climate change issues?

Our approach is based on participatory action methods and includes a capacity-building and knowledge-exchange component. Through a series of focus groups, workshops, field trips and meetings we have initiated a process to:

1. Provide rural groups the opportunity to collaborate with members of the academia
2. Combine diverse types of knowledge to improve decision-making in the face of uncertainty
3. Widen stakeholders' horizons by offering perspectives on the larger landscape (beyond their local community) – help them see the "big picture"
4. Create opportunities for self-organization: seven ideas of locally-relevant adaptation initiatives have been proposed by stakeholders, which will be developed in collaboration with them.

On purpose, we tried to keep our research problem as broad as possible, to gather insights on as many aspects as possible, and while it might not be possible to answer all of the questions thoroughly, we hope to be able to deepen our understanding of some of these problems, especially during the second year / second half of the project.

3. **Research Objectives and Emerging Findings**

Our goal is to understand better the type of environment, attitudes and incentives that are conducive to adopting open practices and to tying knowledge to local problem-solving. Our research is practice-based, with a focus on the role that landscape governance platforms, such as Model Forests, can play.

Challenges so far in the implementation have been mostly administrative challenges (setting up local contracts, bringing money into another country) and the difficulty in finding convenient times for everyone to participate in meetings and workshops. Another major challenge is that the process we had envisioned is extremely time-consuming which also brings us to the lack of human and financial resources.

In the left column of the chart below we have reproduced the original objectives and added comments in the right column for each in relation with the challenges or emerging findings:

Objective	**Comments (challenges, findings)**
§ Create awareness concerning anthropogenic climate change issues and provide capacity-building to stakeholders representing different sectors within the landscape.	We are not focusing on sectors anymore and selected the stakeholders based on factors such as leadership, motivation, etc. The stakeholders successfully involved in the process all belong to organized groups or associations. The challenges in terms of capacity-building are mostly educational challenges, which are commonly encountered in environmental education. In particular, it is difficult for people to relate to complex global problems if they do not see the concrete impacts on their lives.

§ Increase understanding and uptake of climate data and its usefulness to improve decision-making. Give the communities the tools to engage in analysis in order to deal with grand challenges such as climate change.	It is very difficult to “give” the communities analytical tools but we are certainly promoting a reflection on grand challenges at a scale that goes beyond the traditional local community perspective. However, we are no longer focusing on using very specific climate data for decision-making. The sessions have also integrated a focus on practical skills that local people need to implement their selected community-led adaptation initiative.
§ Stimulate the stakeholders to establish concrete strategies at different scales and levels: parcels, sectors, communities, territories.	This is being accomplished through the community-led initiatives under development. The communities have demonstrated to have loads of ideas when it comes to local issues. A challenge is that they often come with already pre-defined ideas of what they would like to achieve.
§ Establish an interactive relationship between scientists and Model Forest stakeholders.	Few scientists are contributing to the project on an ongoing basis; it has been difficult to engage more scientists in the project in a voluntary manner. This has a lot to do with the institutional design and types of rewards offered to scientists by the academia, and with their attitude and the education they received. More soft skills are needed. The main challenge is that it is a high-involvement, time-consuming process. Similarly, people need enough time and space to interact, share opinions, ask advice and go off-topic while scientists tend to value speed and efficiency above other things. The attitude of certain communities is another barrier, they tend to feel intimidated and put themselves in an inferiority position, or to be passive.
§ Define the essential conditions and ingredients for a meaningful and successful OCS process, including behaviors and attitudes, governance architecture, role of leadership, methodology, etc.	We are in the process of collecting enough insights from our research to reach this objective. It is at the basis of this research. We need to put down our meta-analysis of the process in a written format, which will be done during the second year of the project.
§ Stimulate the participation of a diverse range of Model Forest stakeholders in further climate change research and monitoring.	It is too early to know if the stakeholders will be interested in participating further in climate change research, but it is possible that some of them will. We have been trying to “stimulate” scientific curiosity, but there is much more that could be done and there is not enough time for this. Again, the benefits and incentives will be key. Community members need to feel that their participation in research brings about benefits for themselves and their communities, whether these are tangible or intangible. This is a pilot project; therefore, if we had to replicate it at scale, we would integrate all the lessons learned and review the process and methodology. We are learning on how to make it more effective and we have gathered a few ideas that could help design a larger project.
§ Contribute to the understanding of the dynamics of collaboration and participation among actors with different perspectives and needs.	This project is certainly contributing to advancing our understanding of those dynamics. In particular, not only the dynamics between scientists and citizens, but also the dynamics between citizens from different communities and geographical areas of the landscapes who did not have the opportunity to meet and collaborate before. This is an important outcome of this project: creating new links between community groups. It is also part of the Model Forest philosophy.
§ Assess the potential of particular adaptation measures designed and implemented by non-experts and compare with the relevant scientific literature.	We have not reached this stage yet, since the adaptation “measures” or “initiatives” implemented by the communities have not started. One challenge is that their understanding of adaptation varies from the scientific definition of “adaptation”, and some scientists could question the fact that these are really “climate change adaptation” projects (beyond environmental or development projects). However, we do think that these projects all contribute to global change adaptation when the issue is defined in a broader way.

§ Gather insights regarding the enabling conditions, barriers, attitudes, impacts, etc. related to OCS by comparing the process in both Model Forests to identify key variations	This is also part of the meta-analysis we are conducting, which would also need to be part of a formal writing process towards the end of the project. For now, participants in both Model Forests have shown a keen interest in sharing local expertise with scientists but also in receiving the results of relevant studies in a friendly format. No significant differences between the two countries have been found in this regard. There is something extremely universal about the desire to know, to share, to feel that you are being taken into account, etc. The main difference found is related to the structure and context of the academic institution, i.e. the level of engagement of scientists in both institutions.

What does all of this suggests about the nature/context of open science in development? Until now, among other things, this research has confirmed two important things for me.

First, as we stated one of our first monthly reports (March 2015), "openness is a mindset". This has several implications, including that our job is to work on promoting a certain type of attitudes (more openness in the community to the elites and scientists, and more openness in the academia to sharing and co-creating with the community). However, we are constantly reminded that this type of work is not for everyone. Openness should not be forced upon people: we need to respect people's will if they choose not to engage or if they still prefer the conventional way of doing science.

Second, we should not overvalue the label: one can do "open science" without calling it that way. The name or label is useful to promote the belonging to a community, the integration to a broader movement, etc. but on the ground, it is difficult to convey the meaning of this concept, and perhaps not always necessary. Openness therefore is a philosophy, which translates for us in a certain way of doing things, a certain methodology to work with the communities. Platforms such as Model Forests can enrich the openness discourse because they share similar values (as well as other values that are compatible). The fact that the word openness as such is not being used should not be seen as a restriction.

4. Project Implementation and Management:

Completed Activities (February 2015 - 2016)	
Contract signed with OCSDNet and first meetings among the project team	*Feb-March 2015*
Website created for the project	*April 2015*
2 Zotero collection created for the project	*These have been put on hold until they can be reorganized. For example https://www.zotero.org/ocsd_bosquesmodelo/items/collectionKey/E2N52UHS*
5 focus groups conducted in Costa Rica	*By a Master student of CATIE who collected initial information on the potential groups who would*

	participate in the project
Initial presentation in Colombia and initial meeting with local groups	*During a breakfast meeting, the project was introduced and discussed with representatives of the Universidad Tecnológica de Pereira, the CARDER (environmental authority of Risaralda department) and the Risaralda Model Forest.* *During the same trip, we visited potential groups that could participate in the project.*
4 workshops held in Costa Rica and Colombia	*Conducted between June and November 2015*
1 international seminar on open science organized in Colombia	*Conducted in October 2015*
Participation in the OCSD network meeting in Bangkok in February 2016 and other networking activities	*Other included Skype conversations with advisors and coordinators (Matt and Halla, Leslie and Denisse) as well as exchanges through email, Facebook or Skype with other members of the network on different topics*
Participation in the Ibero-American Model Forest Board Meeting in Puerto Rico	*March 2016. Including informal presentation on open science.*
Pending Activities (March 2016 - February 2017)	
Implementation of 7 local initiatives, 3 in Costa Rica, 4 in Colombia	*Including setting up contracts with local groups, provide a micro-fund, follow-up and field visit to local groups, documentation, interviews, etc.*
Updating the website with all the information on the project and other dissemination activities	*Update the information on the main page, eliminate unused sections and add all the resources available http://www.bosquesmodelo.net/recursos-materiales-documentos-ciencia-abierta-y-colaborativa/*
Final workshop and community building activity. Follow-up with groups and interviews,	*This will be the last knowledge-exchange activity, which will include the presentation by the groups of their initiatives. We intend to have a larger audience, including university and government representatives, etc.* *We will also discuss with the groups about their next steps and ideas for the future.*
Possible production of a guide or brochure designed by and for the local groups, perhaps a short YouTube video on the project	*Booklet would be based on their priorities and needs (length and content to be defined).*
Final meta-analysis of the process	*Analytical report and article on findings.*

5. Project Outputs and Dissemination

Workshops held: February 2015 - 2016

Name of workshop	**Outcome(s) of workshop**	**Number of participants present**	**Any relevant links to event information**
First workshop in Colombia and first workshop in Costa Rica "Diálogo de saberes"	Participants met for the first time and received training on climate change. They exchanged about the issues in their respective areas, brainstormed ideas and established a collective definition of adaptation.	15-20 participants duration: two days and a half	Proceedings of first workshop in Colombia published here http://www.bosquesmodelo.net/wp-content/uploads/2015/04/Memoria-Taller-1-Risaralda-OCSD.pdf
Second workshop in Colombia and second workshop in Costa Rica (and subsequent follow-up visits)	Participants met for the second time and presented different ideas and experiences. They worked on the timeline and definition of the local initiatives, how it could impact their community, how it relates to their environmental concerns (including climate change), worked on a timeline etc.	15-20 participants One day and a half + two-hour follow-up visits / meetings with each group between one and three months later	The proceedings and materials still need to be updated on the website

Conferences Attended (to discuss Open Science)

Name of Conference	**Your contribution to the event**	**Outcomes of the conference?** (collaborations, contributions, etc.)	**Any relevant links to event information**
Conference FORCE 2015	Panel discussion with other OCSDNet members	This was part of the project although it was held in January 2015 before the official start of the project	https://www.force11.org/node/6115/#diversity
Seminario Ciencia Abierta	Organizer	Creation of a working group on open science at the UTP	https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwie8buRhofMAhWIHB4KHYqaBUIQFggfMAA&url=http%3A%2F%2Findustrial.utp.edu.co%2Fseminario-ciencia-abierta.pdf&usg=AFQjCNH7F_7lPlMf4glYURvhz-t32DjToA&sig2=NrfkpQSj1aaJtGDvr2tGgA
OCSDNet Bangkok workshop meeting	Participant as member of the network	Short-term and long-term priorities highlighted for the network	

Partnerships Formed to date:

Name of Partner	**Type of stakeholder** (policy maker, research organization, community group, etc.)	**Briefly describe your collaboration with this partner**
Fundación Costa Rica para la Innovación https://sites.google.com/site/fundacioncrinnovacion/home	Organization that promotes citizen participation in innovation processes	They are collaborating with us in Costa Rica to design the workshop and activities with the local groups
Fundación Red Agro-Ecológica Villa de los Guayacanes – new foundation created in Colombia	Community group	Direct outcome of the project in Colombia. We are collaborating with this group to help them set up their local initiative

List of relevant publications (February 2015-2016):

Name of Publication	**Type (book, journal article, newspaper, blog, etc.)**	**Link**
Project's website	Website	http://www.bosquesmodelo.net/colaborar/proyectos-actuales/ciencia-abierta-y-colaborativa-para-el-desarrollo/
Proyecto Ciencia Abierta y Colaborativa	Newsletter of Reventazón Model Forest (Costa Rica)	http://us3.campaign-archive1.com/?u=73cf42d5fad41f897c80f0bd2&id=ffec42c41d&e=a4cc376885
Small is beautiful: Promoting Community Empowerment in Model Forests of Costa Rica and Colombia	blog	http://ocsdnet.org/small-is-beautiful-promoting-community-empowerment-in-model-forests-of-colombia-and-costa-rica/
Tying Open Science with Local Development Needs	blog	http://ocsdnet.org/lessons-from-colombia-tying-open-science-with-local-development-needs/
Inventario de acciones que contribuyen a la adaptación al cambio climático en los Bosques Modelo de Iberoamérica, utilizando el marco de los capitales de la comunidad	Paper submitted and oral presentation at FAO's World Forestry Congress	http://foris.fao.org/wfc2015/api/file/552865b49e00c2f116f8e087/contents/d859f465-e702-453d-ad53-00c7a7b5543b.pdf
Colaborando con el CATIE en el diseño y desarrollo de proyectos	Informal account of our second workshop in Costa Rica	https://sites.google.com/site/fundacioncrinnovacion/0---noticias/colaborandoconelcatieeneldiseноydesarrollodeproyectos
Bosques Modelo: Nuevas formas de investigación desde la ciencia abierta	Interview	http://www.ovtt.org/bosques_modelo_ciencia_abierta_colaborativa

Diálogo de saberes	Master graduation work	*Soon to be available online on CATIE's repository
Across Latin America, Model Forests are providing a natural laboratory for learning and experimentation about landscape governance	Blog on the LPFN initiative, Ecoagriculture partners	http://peoplefoodandnature.org/blog/learning-from-the-forests-a-latin-american-exchange-of-landscape-knowledge/
Poster about the project for presentation at the National Innovation Agency in Bangkok	Poster about activities up until February 2016	Unpublished. (Reproduced at the end of this report)
Openness in the Context of Model Forests of Latin America	Position Paper on Openness for OCSDNet	Unpublished

6. Impact

- In what ways does your research project contribute to the development objectives of your partner community?

Our project promotes the empowerment of community groups and leaders through capacity-building, fostering self-confidence, promoting an open attitude, giving them the opportunities to learn from each other, establishing a more horizontal relationship with scientists.

It also contributes to the governance of the landscape since many of the participants are actively involved in platforms of the Model Forests and contribute by bringing what they have learned to the broader communities (many of them have reported talking about the project at their local meetings).

The development objectives of the local communities are heterogeneous and therefore our role has been mostly to facilitate a process through which the groups can set up their own priorities and plant the first seeds of their community-led initiative.

- How does your work contribute towards building the field of Open Science?

Our work contributes towards building the field of Open Science by exploring new conceptual approaches and putting into practice a new understanding of openness and community science linked to participatory action research.

- How are you measuring and evaluating the impact of your project?

It is a bit early to evaluate impacts. We have not attempted on measuring and evaluating them in a formal way, except through conversations among the team members and through the

participants' evaluation of the workshops. However, we are planning on conducting interviews towards the end of the project for a more in-depth evaluation and assessment of what has changed according to the groups' perspectives.

- In what ways could the network better support your project in terms of short and long-term impact?

The coordination team and advisors can help by finding suitable venues in the coming year to talk about our project, channels through which we can apply for more funding and journals where we might be able to publish the results of our studies. We hope to contribute to a joint book or article. It would be a good idea to cluster the projects by common themes and approaches, have something visual. I would also suggest to give some extra support in terms of guidance to early-career principal researchers who are member of the network.

8. Reflective Learning:

- How are you capturing your team's learnings from participating in the network?

In an informal way until now. We had conversations to discuss and improve the project during its first year and we seek to enhance our practice through constant self-reflection. We follow the network's conversations and how the other projects evolve (via blog posts, reports, etc.), and this feeds into our own experience.

- To what extent are these lessons shaping your practice?

As mentioned above, these are integrated to our practice on an ongoing basis. Without the network, the project would have been probably quite different. The learnings through the network have been invaluable, although they might be difficult to measure. The networked interactions have allowed us to explore new ideas and question ourselves.

- Has feedback from the network had an impact on your research to date? (consider insight from the coordination team, advisors and peers in the network). What further support could the network provide towards achieving your team's project goals?

The coordination team has provided support by engaging in an open science seminar in Colombia that we organized, their participation was greatly appreciated. Some email exchanges with peers have been enlightening on certain topics, but the highest level of interaction has been during the workshop in Bangkok. The coordination team has not provided specific feedback on research outputs. The principal researcher had a good discussion with one advisor (Halla) which helped toreflect on the project from an "external" point of view.

9. Recommendations (for OCSDNet):

- In your experience, Is OCSDNet fostering a culture of shared learning in the network?

Yes, through the google groups, sharing monthly reports, and organizing events that allowed us to get together. However, these things can only be fostered and measured in the long term.

10. Additional Comments (optional)

Below we include the poster presented at the Bangkok network's meeting which sums up the work we accomplished during the first year of our project.