

Project description

Project title: Carbon Offset Project Exclosure - North Gondar

Acronym: COPE - NG

Planned project start: Spring 2013

Duration in years: 2013 - 2018, 5 years (inception phase),
2018 - 2043, 25 years (continuation phase)

Coordinating organisation: University of Natural Resources and Life Sciences, Vienna (BOKU)

Head of coordinating organisation: Rector Prof. Dr. Martin Gerzabek

Postal address: Gregor Mendel Straße 33, 1180 Vienna, Austria

Responsible project coordinator: DI Florian A. Peloschek, CDR, florian.peloschek@boku.ac.at

Responsible scientific unit at BOKU: Centre for Development Research (CDR)

Partner organisation: Amhara Region Agricultural Research Institute (ARARI)

Head of partner organisation: Dr. Fentahun Mengistu Tiruneh

Postal address: Amhara Region Agricultural Research Institute, 527 Bahar Dar, Ethiopia

Contact person: Dr. Abrham Abiyu Hailu, abrhamabiyu@yahoo.com

Team members

Prof. Dr. Georg Gratzner, georg.gratzner@boku.ac.at

Mag. Birgit Habermann, CDR, birgit.habermann@boku.ac.at

Helen Teklu, MA, helen.kukugirl@gmail.com

Yonas Worku Atlasub, BA, ARARI, worku.yonas@yahoo.com

Authors: Mag. Brigit Habermann, Prof. Dr. Georg Gratzner, Dr. Abrham Abiyu Hailu and DI Florian A. Peloschek

A. Project design and substantive quality

I. Objectives

- Develop a participatory framework for a carbon compensation scheme in a community-based exclosure management system supported by research
- Identify community priorities, potentials and constraints for management of exclosures in the study area including priority tree species across different land use, tenure and ownership regimes
- Establish community based sustainable management schemes including communal benefit sharing
- Characterise carbon sequestration and plant biodiversity in the exclosure
- Characterise community benefits of the exclosure management through monitoring

II. Background information

Ethiopia is one of the poorest countries in the world. It is situated at the Horn of Africa and accommodates about 80 million people on around 1.123 million square kilometre surface area. The annual growth rate of the population is 3%. Agriculture is the mainstay of its economy, and it contributes about 56% of the country's Gross-Domestic Product (GDP) and employs more than 84% of the labour force. The production system is smallholder dominated agriculture practiced under rain fed condition. In the Amhara Region, agriculture takes place mostly on small-scale farms with less than one ha. These farms are extremely diverse, and one farm usually incorporates a variety of agricultural practices. Farmers combine crop and livestock production, farm forestry as well as homestead horticulture and provide ecosystem services such as soil and water conservation measures. Land degradation impairs land productivity in the Ethiopian Highlands. Especially in Northern Ethiopia land degradation in connection with weakly developed land tenure security has been accelerated. This has severe consequences for the rural population. The most important counter-measures to halt this process have been plantations of trees and assisted natural regeneration, mainly in areas where access of livestock is reduced or excluded. Plantations of fast growing exotic tree species are good options for increased biomass productivity per given time and area. However, in terms of restoration of degraded lands, this option may fail to address concerns of productivity and diversity. It may not be feasible and compatible with the specific local socio-economic and environmental, technological realities. These realities create a need for a paradigm shift in designing restoration processes towards true participation of land users. Despite their potential importance for ecosystem restoration, exclosures often are less attractive to local people. The establishment of exclosures forces farmers to compete for land. Additionally there is often a lack of direct benefits of exclosures for the local community. (Yami *et al.* 2006, Descheemaekter *et al.* 2006a, Mekuria *et al.* 2007 and 2009, Mekura 2010, Abiyu *et al.* 2011 and 2012)

III. Innovative approach

This study will facilitate a participatory process in order to enable farmers and researchers to engage in the establishment of an exclosure area in Ambober, North Gondar, if they are willing to do so. This approach carried out in parallel with research activities is novel in the context of carbon compensation schemes. The process will also be scientifically documented and evaluated to produce a learning example and manuals for future interventions.

The existing exclosure of about 2 ha could be extended to an area as large as 30 ha. However, at the moment only few local people know about this, and in spite of a generally positive attitude towards

exclosures in the area it is uncertain if the community would endorse the enlargement of the existing exclosure to such an extent. The study will invite farmers and researchers (and other relevant stakeholders) to participate in a process of dialogue and negotiation. The aim is to first (1) find an agreement on the enlargement of the exclosure. The process will have to end at this stage if the farmers are against the enlargement. If they agree, the next step (2) will be to discuss about the scale of the enlargement and the location, then (3) about the species to be planted (or regenerated). This is important information for the working group from ARARI who will be in charge of the biophysical components of the exclosure – before the farmers have completed step 3, their work cannot start. Finally, (4) the management of the exclosure by the community must be negotiated. There will be a dialogue about bylaws, administration, and a decision about local control mechanisms. The final step of the process (5) will to clarify how the expected benefits will be distributed in the community. A major decision for such schemes is the choice of tree species used in the plantations set up in the exclosures. In Ethiopia, Eucalyptus species were favoured because of the fact that they are not browsed by cattle in case the exclosure is entered. Furthermore, Eucalyptus can be harvested after 4-5 years and yields high market prices as construction and fuel wood. Yet scientists are not always in support of Eucalyptus plantations, and they would prefer a higher diversity of species. In principal farmers also favour a mix of different tree species on exclosures, but the composition must be negotiated to reach a sustainable support of the exclosure management by the community. The plant diversity of the exclosure will be monitored and the value of the diversity for the land users will be assessed. The restoration of degraded land is a complex task which has to overcome biophysical as well as socio-economic barriers. Appropriate technologies are necessary to successfully grow trees in such landscapes. In order to overcome the critical first life phases, long stake planting and nurse shrubs for facilitating tree establishment and enriching soils with organic carbon can be used.

IV. Situation analysis & work schedule for the participative planning phase

The situation at the outset is not without potential for conflict. Also the establishment of the first exclosure was not without opposition. The following aspects require careful attention:

- Although in the meetings farmers would agree after some discussion, in June 2012 there was still resentment about the fact that some of the exclosure was already pre-determined without discussing it at first with the community. In the initial phase therefore grazing livestock as well as illegally logged trees were a common phenomenon. However, according to Abrham Abiyu this has improved and there was less transgression in 2011.
- Although Abrham Abiyu found in his research that the wealthier farmers were the ones transgressing most frequently, the research of Birgit Habermann and Habtamu Yeshigat indicated that the relation to the exclosure is more correlated to the location of the farm, depending on that there is more or less interest in this area. Of course wealthy farmers have more livestock, and there is a definite shortage of grazing land in the area. The opposition of the poor is a silent and more hidden one. Perhaps they are afraid to transgress, but the endorsement of the exclosure was not high in the second year (2010).
- Furthermore, there is little knowledge and awareness about research activities in the area. Therefore the planned research interventions and research activities must be carefully negotiated and communicated to the community.
- A discussion with farmers in February 2012 showed that there is now good acceptance of the concept of exclosures among some key persons in Wojnie and Woglo (villages of the watershed), however those farmers are wealthy and well educated farmers and cannot represent the entire

community. These farmers also urged Birgit Habermann and Habtamu Yeshigat for more coordination among organizations and individuals coming to Ambober from outside. In their perception these people do not really know much about each other, and everybody is asking more or less the same questions and doing similar things without coordination.

- The relationship between the different stakeholders such as the development agents, the ARARI researchers, the Woreda administration, and the SRMP- NG (project of the Austrian Development Cooperation) and University of Gondar must be carefully managed.

V. Defining Methods: Choosing a different approach

To overcome the challenges outlined in previous chapter dialogic and emancipatory communication styles should be designed for the engagement with stakeholders. Common methods that are part of participatory processes are informal encounters such as visits to the community to talk to contact persons or people randomly met while walking (e.g. repeated village walks across the area), participating in community meetings (not organized for this process but for social values). Furthermore, often focus group discussions are used for this purpose – however, they need careful preparation, facilitation and then evaluation. These forms of engagement can be with farmers, but also with local government officials.

Another possible method is participatory video (Chowdury, Hambly Odame et al. 2010; Chowdury, van Mele et al. 2011), that gives voice to marginalized people and provides a safe space for articulating their concerns. It can also create a new way of looking at things for both creators and audience. A non-technical solution is forum theatre (Sullivan and Lloyd 2006) that provides everyone in the community the possibility to express themselves. On an organizational level, e.g. in ARARI, methods such as digital story telling (Freidus and Hlubinka 2002) and appreciative enquiry (Cooperrider and Whitney 2008) could be used, especially if there is conflict about some of the decisions to be made. Community stories are also used on a local level, for example in Participatory Narrative Enquiry (Beardon and Newman 2009: 64): *“Participatory Narrative Inquiry (PNI) is an approach to helping groups of people gather and work with stories to make sense of complex situations for better decision-making. PNI emphasises raw stories of personal experience; diversity of perspectives and experiences; interpretation of stories by those who told them; catalytic pattern exploration; and narrative group sense-making. [...] Most importantly, the goal of story work is never the **creation** of stories. It is the creation of authentic insight and understanding that leads to informed, balanced, multi-perspective decisionmaking. Stories are the vehicle, not the destination.”*

Regarding “participation” it is important how the resp. methods are used – the engagement with people must be carefully planned and structured (Bell, Morse *et al.* 2012). There is a wide range of so called participatory methods available (ranking, mapping, village walks, Venn diagrams, mind mapping, rich picture,..). And there are some more specific approaches also subsumed under participatory approaches such as action research and collaborative learning.

To find the right approach for this study and the people concerned by it will require some initial negotiation. The study team for the participatory process (Birgit Habermann, Helen Teklu and Yonas Worku) is already familiar with the area. While there is a risk of bias inherent in this, there is of course an advantage that saves a lot of time and resources.

The participatory process must run through a series of steps that need careful preparation and planning:

- 1) Revisit and update situation analysis
- 2) Identify current stakeholders (high fluctuation!)

- 3) Obtain permission to work by government authorities (must be informed by high level authorities at BOKU): government must know about the project of BOKU (official letter from BOKU), and the study team needs a written permission to work with the farmers (recommendation letter by BOKU)
- 4) Preparatory meetings
 - a. with ARARI team (Bahir Dar)
 - b. ADC (Addis Abeba), SRMP-NG (Gondar)
 - c. Bureau of Agriculture in Gondar, Maksegnit Woreda
 - d. Development agents in Ambober
 - e. Watershed committee in Ambober
 - f. Research contacts in Ambober (incl. priests, Kebelle chairmen...)
 - g. Forest committee in Ambober
 - h.
- 5) First draft design of methods of engagement
- 6) Discuss design with stakeholders, adapt methods design for consensus
- 7) START PROCESS of the participatory process

Precondition: Agreement with government and local administration

STEP 1: DECISION ON EXTENSION OF EXCLOSURE

Is there a consensus among stakeholders on extending the existing enclosure?

- Identify obstacles, pitfalls, possible overruling by marginalized groups by powerful actors, political problems,...(careful attention needed for social processes in the villages)
- Reach decision with stakeholders on extension of enclosure AND accept the final decision of the farmers, and make sure this is what THEY REALLY WANT.

If no, end of process.

If yes, then...

STEP 2: SCALE AND LOCATION

Which area can be included in the extension (place)?

- An extension of the same area, or a new location?

How large can the enclosure become in the imagination of stakeholders in the next 30 years?

- Size of enclosure for the next 5 years (inception phase) resp. 30 years(continuation phase)
- Long term vision: this is a difficult question; due to historical (no continuity in land use planning) and cultural (the nature of life in a volatile and fragile environment does not allow long term planning for farmers) reasons planning ahead for 30 years may seem meaningless, especially for the farmers. However, they have repeatedly asked for more *long-term engagement*, so hopefully this will also be seen as a positive aspect of the project.

STEP 3: SPECIES COMPOSITION

Which tree and shrub species should grow in the enclosure and who will monitor their development?

- Debating differences in priorities between farmers, researchers and extension may be time consuming: potential for conflict. Farmers may keep quiet and afterwards they will complain. This process needs to be carefully managed. Compromise between needs of researchers (biodiversity) and farmers (productivity in terms of fuel, poles, timber and fodder) must be reached smoothly.
- Plantation and natural regeneration: a balance must be found. Who will be responsible for carrying out plantations, and who will monitor regeneration? Is a Participatory monitoring scheme possible?

STEP 4: ADMINISTRATION OF EXCLOSURE

How will the farmers protect the enclosure from transgression?

- Negotiation of bylaws
- Establishment of administration of enclosure on local level, decision on committee or other control mechanisms

STEP 5: BENEFITS

How will benefits of the enclosure be distributed among farmers?

- What are the benefits? This certainly will already be a topic earlier on in the process (Step 1) as well.
- Who will benefit?
- How will the benefits be administered?

8) PHASING OUT of the participatory process

Also the “end” of the participatory process needs a phasing out stage. This is the time when the researchers from ARARI have already started working with the community, and the first experiences with the extension of the enclosure have been made. This is an important stage that needs some backing up and attention, as this is often a stage where a lot of conflict arises. Therefore the farmers and other stakeholders must have the possibility to share their experiences, and to debate about them, as well as coming to a joint decision about how to address new challenges arising in this crucial phase.

The project team is committed to an approach that respects the right to decide of stakeholders in the process. The primary stakeholders are the farmers of Ambober, because they are the ones who have to live with the enclosure at the end of the day. The success of the site depends on their agreement and endorsement of the intervention.

The participatory process will be carefully structured and documented and is also seen as a learning process that will be analyzed thoroughly for future publications in order to influence the debate on local participation in carbon compensation schemes. Furthermore, thinking about action research (Eikeland 2006; Stringer 2007) and involving the community in research and monitoring of the enclosure after the extension has been approved¹, would encourage future transdisciplinary research cooperation.

Forest growth inventory

An inventory on forest growth will be conducted to monitor the carbon sequestration and ensure appropriate monitoring. Therefore permanent sample plots (PSP) will be established for recording baseline carbon stocks and change in carbon stocks as well as for monitoring biodiversity change through time. The forestry team at Gondar Agricultural Research Center (GARC) will be responsible for the design and maintenance of PSP. In most cases the design of will follow the fashion of the PSPs at the Vienna woods established by the Institute of forest growth research at BOKU.

According to the United Nations Framework Convention on Climate Change (UNFCCC) methods for estimation of carbon stock is based on measurement of biomass of trees and shrubs. For ex ante estimation of tree biomass it applies tree/stand growth models and for ex post estimation of tree

¹ <http://www.communitycarbonforestry.org/NewPublications/CIFOR%20paper%20Nov%205%20version.pdf>
http://www.forest-trends.org/documents/files/doc_2447.pdf
<http://journal.ipid-umn.org/node/83>
<http://www.odi.org.uk/resources/details.asp?id=2580&title=making-redd-work-poor>

biomass it uses field measurement data from sample plots. Biomass of shrubs is estimated from field measurement of the shrub crown cover.

The most important parameters to be measured inside the PSP are: Tree/shrub species, height, diameter, crown width, crown depth, crown volume, height to the base of the crown, height to the widest portion of the crown, the number of stems per tree (for shrubs), health of the tree, vitality and vigor, coordinates of the trees and PSPs

These parameters will be important to calculate: carbon stock as well as change in carbon stock in tree biomass within the project boundary at a given point of time or in a span of years; and carbon stock as well as change in carbon stock in shrub biomass within the project boundary at a given point of time or in a span of years.

Techniques for estimation of carbon stocks of trees and shrubs include biomass expansion factor (BEF) technique, algometric equation technique, and baseline default technique.

Methods for estimating change in C stock in trees include stock change method, increment method, and baseline default method. Carbon stock in shrub biomass is estimated for each shrub biomass stratum delineated on the basis of shrub crown cover. All the above-mentioned tools, procedures, guidelines and guidance are based on UNFCCC tools and procedures².

VI. Results and Sustainability

Relevance for and contribution to development & applicability of expected results in practice:

Documentation of the participatory process will be a first step to develop a manual to make the participatory approach more widely adopted in Ethiopia. The research site can act as a leaning ground and examples for future interventions and the applicability of expected results are out into use. In this connection, it might be useful and productive to combine also manuals for other countries.

Influence on opportunities of women:

Women are involved in the formulation and the implementation of the project during the participatory process in each step. Women play a particularly important role in nursing tree seedlings have their knowledge and experience will be highly valued in the process. It presents thus an opportunity to make this role and knowledge more visible, and thus enhance the otherwise poor and disempowered status of women in the society.

The local team working on the participatory process is composed of one female and one male researcher in order to reach women, and also in order to train a female researcher in this methodology.

Furthermore, the project consortium will identify female students at Bahar Dar University and University of Gondar for Bachelor or Master thesis research on the site.

MS thesis research will be supported by

CDR:

- theoretical supervision by an experienced and motivated team of researchers
- guidance in literature research, development of research instruments and field preparation
- peer learning and assistance
- attached to a project, the thesis is focused on latest questions of development practice
- assist in application for a scholarship

ARARI:

² <http://cdm.unfccc.int/Reference/tools>

<http://cdm.unfccc.int/Reference/Procedures/index.html>.

- theoretical and field supervision by an experienced and motivated team of researchers
- guidance in literature research, development of research instruments and field preparation

Dissemination strategy and exploitation of project outputs:

The dissemination of the transdisciplinary research model is important for making the participatory approach more widely adopted in Ethiopia. This will be reached through the following dissemination mechanisms: Presentations in research coordination meetings; presentations in national and international seminars/conferences; publication of reports, case studies, research papers...

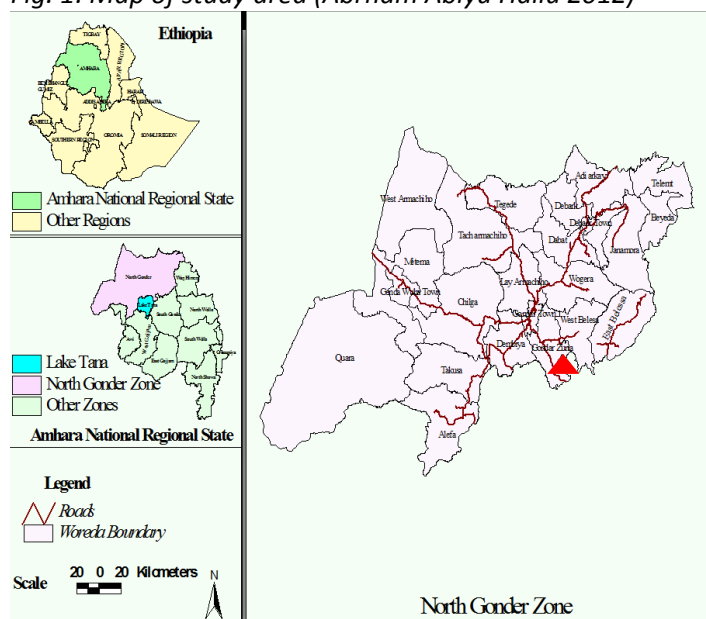
Expected results:

Besides establishing and maintain a 30 year community administered enclosure, scientific publications are expected on the participatory process as well thesis research by Ethiopian and Austrian students on the site.

VII. Project site

Ambober is located north of Lake Tana (12°31'2.87"N and 37°31'24.37"E), approximately 30 km south of Gondar in the Amhara National Regional State (ANRS).

Fig. 1: Map of study area (Abrham Abiyu Hailu 2012)



Ambober is connected to the main highway with a 10 km dry weather road. The main highway connects the regional capitals Bahir Dar and Gondar. The average land holding is 0.56 ha. The farming system is mixed crop livestock system where trees also form valuable components. The area is a transition zone between low production potential cereal-livestock zone in the east and high production potential cereal-livestock zone in the west and south. A typical household is entitled over three parcels of land. The first parcel of land is located surrounding the homestead. The second and the third parcels located away from the homestead. This is the result of the government land redistribution programme.

Pic. 1: View towards the previously established enclosure of the project carried out by Dr. Abrham and Prof. Georg Gratzler (© B. Habermann).



B. Project management

I. Project management and capacity of the consortium

Project partner in Ethiopia is the Amhara Region Agricultural Research Institute (ARARI), which includes 5 research directorates namely Soil-Water Conservation and Management Research, Forestry and Agroforestry Research, Agricultural Mechanization and Food Processing Technology Research, Crops Research, and Livestock Research. As the main public research institution in Amhara Region, ARARI is actively conducting agronomic and forestry related research in North Gondar.

As initiator of the 'Carbon Offset Project Enclosure - North Gondar' the University of Natural Resources and Life Sciences, Vienna (BOKU), will be the overall project coordinator and channels its contribution through the Centre for Development Research (CDR). As an organization with expertise in applied development research, the CDR develops and promotes development innovations at the science - practice interface. It collaborates with over 20 BOKU scientists and a wide range of partners in Africa, Asia and Latin America to increase well-being and improve rural life. Over 30 research projects in 15 development countries target research issues related to soils, water, crops, forests, livestock, or fisheries, while taking into account the social processes that underlie their use.

BOKU and ARARI have prior relevant experiences and expertise in cooperation. Furthermore, many ARARI staff with the support of Austrian Development Cooperation completed their MSc and PhD studies at BOKU. Most of them conducted their thesis research work in project area in North Gondar of Amhara Region. Currently the **appear** funded project TRANSACT, a joint initiative of BOKU, Bahar Dar University, University of Gondar and ARARI, fosters interinstitutional cooperation.

The distribution of tasks and responsibilities, to ensure constructive cooperation and collegial decision making, will be detailed in Terms of References (ToR) for BOKU and ARARI experts contributing to this project. Prof. Dr. Georg Gratzer will provide senior advice and has the overall project lead. The project team consists of Ms. Birgit Habermann, Ms Helen Teklu, Mr. Florian A. Peloschek, Dr. Abrham Abiyu and N.N. The project consortium involves farmers and all stakeholders identified during the participatory process. In a nutshell, the CDR will coordinate the project activities from Vienna; Mr. Florian A. Peloschek will oversee the project activities. Dr. Abrham Abiyu will provide conceptual and technical inputs and will coordinate all activities on location in North Gondar. Ms. Birgit Habermann will coordinate the participatory process. The project is funded by the BOKU carbon offsetting system handled by BOKUs Centre for Global Change and Sustainability (CGCS).

II. Annual work and budget plans, reporting

Annual work and budget plans will be jointly prepared every year and are submitted by the project consortium to BOKUs CGCS. The CGCS will ensure the availability of funds for each year in the inception phase. Together with the annual work and budget plan of the previous year the project consortium will submit a report to CGCS. Roles and responsibilities will be detailed in the ToR. Financial management of the project will be in amicable arrangement overseen by CDR. The annual budget will be disbursed by BOKUs CGCS. It consists of the budget directly executed by BOKU and the budget routed through ARARI. The budget routed through ARARI will follow certain rules for disbursement and accountability detailed in the ToR.

III. Auditing

During the lifetime of the project, BOKU will also employ an auditor. The audit will be done at unspecified date before the project is ending. The objective of the audit is

- to enable the auditors to express their professional opinion(s) on the financial position of the project.



- To determine whether transactions and expenditures incurred by the Ethiopian partner ARARI are in accordance with project budget table and project proposal, and that funds have been used for the intended purpose.
 - To determine, on the basis of examination, whether the documentation that is submitted to BOKU reflects the real situation on the finances and financial management system of the partner institutions.
 - To analyze problems observed and submit specific recommendations for improvements within the area of competence of the auditor.
- Their recommendations will have to be taken care of seriously otherwise we have to repay funds

IV. Monitoring

The project coordination at CDR is in charge to oversee all activities. Periodical communication between the project leader, the project team and the consortium members will ensure that all partners are informed in good time about the status of the project. The annual progress reports and financial report ensure project controlling. Report formats successfully developed in previous partnerships with ARARI will be adapted for this project. These reporting formats include problem identification, steps towards problem solving and reporting on progress on problem solving in the next report. Crucial for a successful project implementation is a well developed communication structure, therefore great emphasis is on a continuous communication between the partners. This will be guaranteed through clear communication pathways that will be defined mutually in the ToR.

In addition, workshops of the coordination team guarantee the exchange of information and facilitate the decision making process.

V. Risks and assumptions

One assumption and central precondition for the successful implementation is the active participation of all partners throughout the whole project. This will ensure that all activities are completed within the given time frame and ensure results of high quality. Internal risks affecting the work packages are associated to the work-load, staff turn-over, lack of motivation and a negative perception of the project. Mitigation strategies are long term planning of activities, good project documentation to help new staff taking over responsibilities and good marketing of the project at all stages. External risks include policy changes by a government; either in Austria or Ethiopia (see Chapter A. IV). The project leader and the project team will work at all levels to ensure that the innovative approach of this project will be considered as very important to provide capacity supporting the sustainable development goals.

Another precondition is the availability of funds provided by the BOKU carbon offset system. A prerequisite is therefore that during the project execution the policies at BOKU remain stable and the carbon offset system will be maintained. At the point of writing this proposal, no signs for policy changes are noticeable. The project team will investigate already during the project possible strategies to secure the sustainability of the project, in close collaboration with and supported by CGCS.

VI. Milestones for the next half year until November 2013

| What? | Until when? () |
|---|----------------------|
| Draft project plan by BOKU | January 2013 |
| Submit first draft of the project plan to ARARI | February 2013 |
| Discuss draft with ARARI, improve project plan jointly | February, March 2013 |
| Review project plan and develop final version, | March, April 2013 |
| final approval by CGCS and secure funding for inception phase | April 2013 |
| Transfer of 1 st tranche of money to ARARI | May 2013 |
| Sign agreement on collaboration ARARI+BOKU | May 2013 |
| Preparation participatory process | April, May 2013 |
| Preparatory meetings participatory process in Ethiopia | May 2013 |
| Village level process participatory process I | May, June 2013 |
| Village level process participatory process II | November 2013 |

VII. References

Abiyu Hailu, A. (2005). Effects of different restoration strategies on soils, vegetation and peoples in Tehuledere district, South Wello, Ethiopia. Institute of Forest Ecology. Vienna, University of Natural Resources and Life Sciences. **Master of Science in Mountain Forestry**.

Abiyu Hailu, A. (2012). The role of seed dispersal, exclosures, nurse shrubs and trees around churches and farms for restoration of ecosystem diversity and productivity in the Ethiopian Highlands. Institute of Forest Ecology. Vienna, University of Natural Resources and Sciences. **Doctorate degree**.

Bell, S., S. Morse, et al. (2012). "Understanding stakeholder participation in research as part of sustainable development." *Journal of Environmental Management* 101: 13-22.

Chowdury, A. H., H. Hambly Odame, et al. (2010). "With or Without a Script? Comparing Two Styles of Participatory Video on Enhancing Local Seed Innovation System in Bangladesh." *The Journal of Agricultural Education and Extension* 16(4): 355 - 371.

Chowdury, A. H., P. van Mele, et al. (2011). "Contribution of Farmer-to-Farmer Video to Capital Assets Building: Evidence from Bangladesh." *Journal of Sustainable Agriculture* 35(4): 408-435.

Stringer, E. T. (2007). *Action Research*. Los Angeles - London - New Delhi - Singapur, Sage Publications.
 Descheemaeker, K., Muys, B., Nyssen, J., Poesen, J., Raes, D., Haile, M., Deckers, J., 2006. Litter production and organic matter accumulation in exclosures of the Tigray highlands, Ethiopia. *Forest ecology and management* 233, 21-35.



Hailu, A. A. (2012). "The role of seed dispersal, exclosures, nurse shrubs and trees around churches and farms for restoration of ecosystem diversity and productivity in the Ethiopian highlands." Dissertation for obtaining a doctorate degree at the University of Natural Resources and Life Sciences, Vienna

Eikeland, O. (2006). The Validity of Action Research - Validity in Action Research. Action and Interactive Research. Beyond Practice and Theory. K. Aagaard Nielsen and L. Svensson. Maastricht, Shaker Publishing: 193–240.

Sullivan, J. and R. S. Lloyd (2006). "The forum theatre of Augusto Boal: A dramatic model for dialogue and community-based environmental science." *Local Environment* 11(6): 627-646.

Freidus, N. and M. Hlubinka (2002). "Digital storytelling for reflective practice in communities of learners." *ACM SIGGROUP Bulletin* 23(2).

Cooperrider, D. L. and D. Whitney. (2008). "A positive revolution in change: Appreciative inquiry." Retrieved 2.5.2012, from <http://appreciativeinquiry.case.edu/uploads/whatisai.pdf>.

Mekuria, W., Veldkamp, E., Haile, M., Nyssen, J., Muys, B., Gebrehiwot, K., 2007. Effectiveness of exclosures to restore degraded soils as a result of overgrazing in Tigray, Ethiopia. *Journal of Arid Environments* 69, 270-284.

Mekuria, W., E. Veldkamp, M. Haile, K. Gebirehiwot, B. Muys, and J. Nyssen. 2009. Effectiveness of exclosures to control soil erosion and local community perception on soil erosion in Tigray, Ethiopia. *Afr. J. Agric. Res.* 4:365–377.

Mekuria, W. (2010) Effectiveness of exclosures to restore ecosystem carbon stock and vegetation in the highlands of Tigray, Northern Ethiopia. PhD thesis, Göttingen University.

Yami, M., K. Gebirehiwot, M. Stein, and W. Mekuria. 2006. Impact of area exclosures on density, diversity, and population structure of woody species: The case of May Ba'ati-Douga Tembien, Tigray, Ethiopia. *Ethiop. J. Nat. Resour.* 8:99–121.