Discussing results with land users to raise awareness (Stefan Hohnwald)

From storylines to scenarios: raising awareness and decision support (Brazil)

DESCRIPTION

Investigating viable carbon-optimized land management strategies, which maintain or improve ecosystem function, under changing climate conditions in the Southern Amazon - using regional scenarios generated from storylines.

Aims / objectives: One objective of the Carbiocial project, in close cooperation with its Brazilian partner project Carbioma, is to explore how land use change in one of Brazil's most dynamic regions will develop in the next 30 years and how it will be affected by the implementation of land-use planning options and conservation policies. For this purpose a set of scenarios was created. The scenarios portray different plausible development pathways for the region. Each scenario consists of a storyline: a brief narrative of the future. At this level farmers and institutions are involved. An expert panel translated the findings of several stakeholder workshops and extensive stakeholder and expert interviews, conducted in 2012, into qualitative information needed to elaborate these scenarios. Four storylines emerged: (1) "business-as-usual"; (2) sustainable, extensive use of the Amazon; (3) legal intensification; (3) illegal intensification.

Methods: It was agreed that the communication between qualitative social science data and quantitative data had to be considered carefully. A blend of the required input factors for the models was agreed as guiding principles for all storylines: these were: population, agrarian production, livestock, agrarian and environmental policies, protected areas, infrastructure, impact of climate change (mitigation/adaptation). In a second step, qualitative data had to be added to the models; to limit bias, all available German experts on Southern Amazonia participated in a day-long (and quite controversial) brainstorming session producing content for the four storylines.
After translating the results into Portuguese the outcome was discussed with representatives of government and NGOs to discuss their plausibility and to modify accordingly. The input of local stakeholders was included on the basis of discussions and qualitative interviews. Generally speaking, the feedback loops with Brazilian stakeholders' happened rather arbitrarily. Participation could have been better if planned more methodically and earlier.
The three hypothetical storylines describe different pathways of future regional development within the two states. Due to the strong linkages of Southern Amazonia to global markets (e.g. exports of soybean and meat) it was necessary to portray this dependency as one important determinant within the scenarios. Also, law enforcement of the existing legal situation was considered: more than 40% of Amazônia comprises protected areas. In order to portray the possibility of progressive environmental and indigenous legislation, a vibrant civil society, and well-institutionalized public prosecutors, a sustainability scenario was designed.
The next step was the quantification of the qualitative information to facilitate a simulation-based scenario analysis. Simulation models will be combined as software packages to support the decision-taking process from local to landscape and regional scale. All research and implementation activities include direct involvement of the stakeholders. Field experiments for improving C storage and ecosystem function will be performed in cooperation with an NGO founded by the farmers of Mato Grosso.

LOCATION

Location: Mato Grosso/Pará, Brazil, Brazil

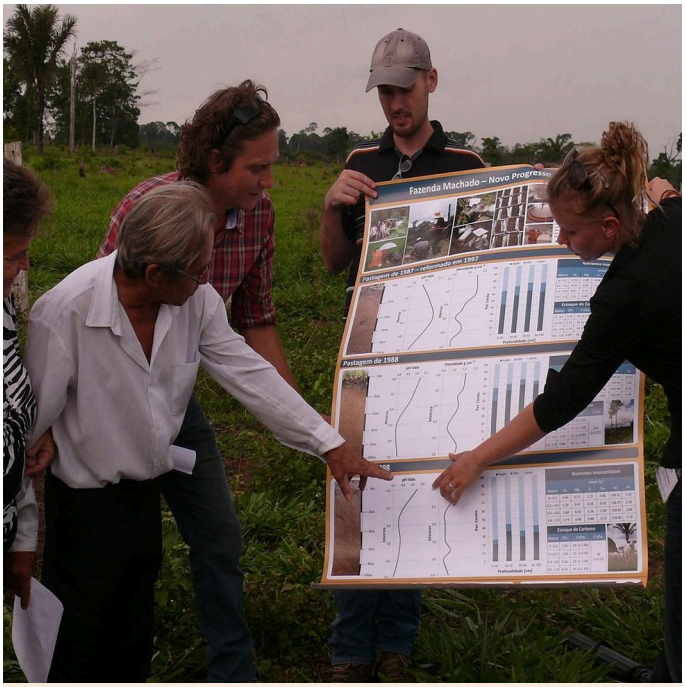
Geo-reference of selected sites
- -54.01462, -9.60518

Initiation date: 2011

Year of termination: 2016

Type of Approach
- ☐ traditional/ indigenous
- ☐ recent local initiative/ innovative
- ☑ project/ programme based

Other important information: A set of land use maps was generated to depict scenarios from 2010 to 2030. The objective of this modelling and mapping exercise is to support decision-makers to better interpret the scenarios and their implications. These new layers of information will facilitate further model or GIS-based analysis of land use change impacts on the regional carbon balance and the loss of biodiversity, and may act as a test-bed for the development of strategies towards sustainable land management.



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Land use system along Route BR 163 (Stefan Hohnwald)

APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims / objectives of the approach

The Approach focused mainly on other activities than SLM (carbon-optimized land management)

The joint main goals are 1) to perform region-specific analyses in order to improve and apply interdisciplinary sets of models of land use impacts on carbon stocks, water and GHG balances, 2) to develop and optimize land management strategies that minimize carbon losses and GHG emissions, and maximize carbon sequestration, 3) to assess the trade-offs between land management options and socio-economic impacts in terms of GHG reduction, profitability, ecological sustainability, and last but not least, 4) to support the Brazilian partners to implement the optimal techniques in practice, considering the soybean value chain and overall carbon balance.

The SLM Approach addressed the following problems: High loss of vegetative and soil carbon due to agricultural expansion (deforestation), agricultural emissions, biodiversity loss.

Conditions enabling the implementation of the Technology/ ies applied under the Approach

Conditions hindering the implementation of the Technology/ ies applied under the Approach

- **Social/ cultural/ religious norms and values**: Acceptance of research results Treatment through the SLM Approach: Dissemination of research results in the form of policy briefs (short graphical illustration of results) and “output-stick” (USB stick with more detailed research results).
- **Legal framework (land tenure, land and water use rights)**: Land tenure Treatment through the SLM Approach: None The existing land ownership, land use rights / water rights greatly hindered the approach implementation Especially in Pará, land tenure rights are uncertain and lead to land speculation with resultant land degradation and deforestation.

PARTICIPATION AND ROLES OF STAKEHOLDERS INVOLVED

Stakeholders involved in the Approach and their roles

What stakeholders / implementing bodies were involved in the Approach?	Specify stakeholders	Describe roles of stakeholders
local land users/ local communities		
community-based organizations	Indigenous groups were involved in stakeholder workshops with the aim of discussing different storyline options, and in the following feedback loops discussing the resulting storylines.	
SLM specialists/ agricultural advisers		
national government (planners, decision-makers)	planning authorities	

Involvement of local land users/ local communities in the different phases of the Approach

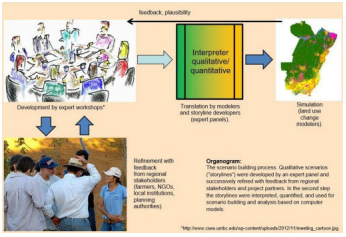
	none	passive	external support	interactive	self-mobilization
initiation/ motivation				✓	
planning	✓				
implementation	✓				
monitoring/ evaluation	✓				
Research		✓			

Land users and planning authorities; identification of research priorities, state-of-the-art of agricultural practices, identification of problems.

Research plots for demonstration.

Flow chart

The scenario building process. Qualitative scenarios ("storylines") were developed by an expert panel and successively refined with feedback from regional stakeholders and project partners. In the second step the storylines were interpreted, quantified, and used for scenario building and analysis based on computer models.



Decision-making on the selection of SLM Technology

Decisions were taken by
- land users alone (self-initiative)
- mainly land users, supported by SLM specialists
- all relevant actors, as part of a participatory approach
- ✓ mainly SLM specialists, following consultation with land users
- SLM specialists alone
- politicians/ leaders

Decisions were made based on
- evaluation of well-documented SLM knowledge (evidence-based decision-making)
- research findings
- personal experience and opinions (undocumented)

TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT

The following activities or services have been part of the approach

- ✓ Capacity building/ training
- ✓ Advisory service
- Institution strengthening (organizational development)
- ✓ Monitoring and evaluation
- ✓ Research

Capacity building/ training

Training was provided to the following stakeholders
- ✓ land users
- field staff/ advisers

Form of training
- on-the-job
- ✓ farmer-to-farmer
- ✓ demonstration areas
- ✓ public meetings
- courses

Subjects covered

Training focused on raising awareness of the consequences of "business-as-usual" behavior compared with other scenarios.

Advisory service

Advisory service was provided
- ✓ on land users' fields
- at permanent centres

Name of method used for advisory service: dissemination of research results in the form of policy briefs and more detailed "output sticks"

Advisory service is quite adequate to ensure the continuation of land conservation activities

Monitoring and evaluation

bio-physical aspects were ad hoc monitored by project staff through observations bio-physical aspects were ad hoc monitored by project staff through measurements socio-cultural aspects were ad hoc monitored by project staff through observations socio-cultural aspects were ad hoc monitored by project staff through measurements There were few changes in the Approach as a result of monitoring and evaluation: Dissemination; form of dissemination was adjusted according to the requirements of target groups. There were no changes in the Technology as a result of monitoring and evaluation

Research

Research treated the following topics
- sociology
- economics / marketing
- ✓ ecology
- ✓ technology

Research was carried out both on station and on-farm

FINANCING AND EXTERNAL MATERIAL SUPPORT

Annual budget in USD for the SLM component

- [ ] < 2,000
- [ ] 2,000-10,000
- [ ] 10,000-100,000
- [x] 100,000-1,000,000
- [ ] > 1,000,000

Precise annual budget: n.a.

Approach costs were met by the following donors: international (German Ministry of Education and Research BMBF): 100.0%

The following services or incentives have been provided to land users

- [ ] Financial/ material support provided to land users
- [ ] Subsidies for specific inputs
- [ ] Credit
- [ ] Other incentives or instruments

IMPACT ANALYSIS AND CONCLUDING STATEMENTS

Impacts of the Approach

	No	Yes, little	Yes, moderately	Yes, greatly
Did the Approach help land users to implement and maintain SLM Technologies? Identification of method of applying organic matter to soil; identification of kind of agriculture most suitable for specific region/area; type of crop sown; crop sowing dates; economic return/economic optimization.			✓	
Did the Approach empower socially and economically disadvantaged groups?	✓			
Did the Approach improve issues of land tenure/ user rights that hindered implementation of SLM Technologies? Research had no effect on land tenure; research was not aimed at solving the problem, rather research helped to identify the problem. The problem is likely to be overcome in the near future. reforms of land tenure rights underway	✓			
Did other land users / projects adopt the Approach?		✓		

Main motivation of land users to implement SLM

- [x] increased production
- [x] increased profit(ability), improved cost-benefit-ratio
- [ ] reduced land degradation
- [ ] reduced risk of disasters
- [ ] reduced workload
- [x] payments/ subsidies
- [x] rules and regulations (fines)/ enforcement
- [ ] prestige, social pressure/ social cohesion
- [ ] affiliation to movement/ project/ group/ networks
- [ ] environmental consciousness
- [ ] customs and beliefs, morals
- [ ] enhanced SLM knowledge and skills
- [ ] aesthetic improvement
- [ ] conflict mitigation
- [x] well-being and livelihoods improvement

Sustainability of Approach activities

Can the land users sustain what hat been implemented through the Approach (without external support)?

- [ ] no
- [x] yes
- [ ] uncertain

No-till agriculture, crop rotations, recommended sowing dates, expanding agricultural land according to crop yield information, and information regarding negative effects of cropland/rangeland expansion (e.g. soil and site specific GHG emissions) which were identified through the different scenarios.

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

Strengths: compiler's or other key resource person's view

- improved choice of crop/crop rotation; more environmental friendly choice of kind of agriculture employed (agroforestry systems); improved awareness of existence and functionality of regulations in favor of sustainability better dissemination; heightened awareness of land users to sustainability topics and environmental degradation

Weaknesses/ disadvantages/ risks: land user's viewhow to overcome

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's viewhow to overcome

- Acceptance of results by famers, planning authorities, decision makers in general (political level).

REFERENCES

Compiler
Jan Goepel

Editors

Reviewer
David Streiff
Deborah Niggli

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Resource persons
Jan Goepel (goepel@cesr.de) - SLM specialist
Stefan Hohnwald (shohnwa@gwdg.de) - SLM specialist
Juliana Gil (julianagil@uol.com.br) - SLM specialist
Georg Guggenberger - None
Michael Klingler - SLM specialist
Tobia Lakes - SLM specialist
Jürgen Böhner - SLM specialist
Rüdiger Schaldach - SLM specialist
Matthias Siebold - SLM specialist
Claas Nendel - SLM specialist
Regine Schönenberg - SLM specialist
Gerhard Gerold - SLM specialist

Full description in the WOCAT database
https://qcat.wocat.net/af/wocat/approaches/view/approaches_2616/

Linked SLM data
Technologies: Carbon-enrichment of tropical agricultural soil with organic matter
https://qcat.wocat.net/af/wocat/technologies/view/technologies_1250/
Technologies: Carbon-enrichment of tropical agricultural soil with organic matter
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Project
- Book project: Making sense of research for sustainable land management (GLUES)
- Carbon optimized land management strategies for southern Amazonia (CARBIOCIAL / GLUES)

Key references

- J. Goepel et al. (2016) Future scenarios of land-use and land-cover change in Southern Amazonia and resultant greenhouse gas emissions from agricultural soils, to be published in Regional Environmental Change Special Issue “Southern Amazonia”,(in review) :
- Schönenberg et al. (2016)Inter- and transdisciplinary scenario construction to explore future land use options in Southern Amazonia, to be published in Ecology & Society (in review) :
- R. Schaldach et al. (to be published) A multi-scale modelling framework for the analysis of societal and environmental processes in Southern Amazonian land systems: Lessons learned from the Carbiocial project.:

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