

Companion Modeling for collective learning on land & water management in Northern Thailand Highlands

Resource management context



- Ethnic minorities in the highlands have long been considered responsible for environmental degradation of ecologically fragile head watersheds.
- Their access to farm land and forest resources, and their participation in decision making about resource use is highly limited.

• The current policy of decentralization is an opportunity to better accommodate multiple interests at various levels of organization.

Research questions

- How to promote the emergence of ecologically viable and socially equitable concerted renewable resource management in such complex and uncertain socio-ecological systems?
- How to enable farming communities to identify adapted and agreed-upon solutions, and to negotiate their projects with official institutions at a higher level of organization?



Companion modeling for collective learning in Mae Salaep

- Companion Modeling (ComMod) is an interdisciplinary approach combining individual interviews, group debates, role-playing games (RPG) and multi-agent systems (MAS) to stimulate collective learning for adaptive management of renewable resources (<http://commod.org>).

• ComMod has been tested in the village of Mae Salaep since 2002 (fig.1).

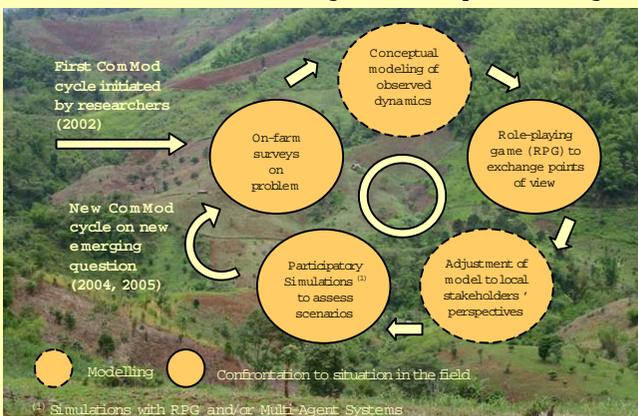


Fig. 1. Main steps of ComMod cycles implemented in Mae Salaep, northern Thailand.

- The RPG is a simplified version of the MAS model. It allows stakeholders to understand and criticize researchers' representations of the system. It also triggers discussions among them.
- Besides collective debates, individual interviews allow to elucidate the participants' behavior during gaming sessions, to record their opinions on the outcomes of collective discussions, to validate the model, and to assess the effects of the learning process.
- As discussions and identification of solutions raise new questions, the game and the MAS model were adjusted to fit the changing focus in three successive ComMod cycles.

Mae Salaep study site and initial land degradation issue



- In this Akha village, the former swiddening system is replaced by a semi-permanent cash cropping-based agriculture following 25 years of integration into the market economy.
- The increased risk of soil erosion perceived by lowlanders threatens highlanders with further restrictions on their access to land.

Evolution of the focus of discussions along the learning process

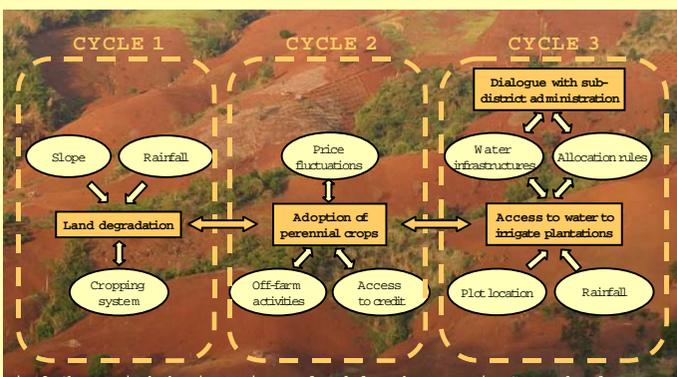
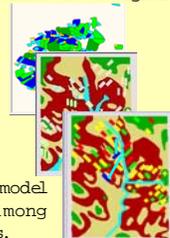


Fig. 2. Changes in the key interactions analysed along the successive ComMod cycles



- The **first ComMod cycle** focused on the agro-ecological aspects of soil erosion. Participants identified the expansion of perennial crops as a promising solution, and requested to focus on socio-economic aspects related to their adoption (fig. 2).

- The **second cycle** simulated exchanges on the problem of unequal access to credit and perennial crops. Farmers suggested changes in the rules for credit allocation of the government fund, but could not enforce them as rules are decided at a higher institutional level.



- In the **third cycle**, farmers requested the participation of the *tambon* (sub-district) administration organization (TAO) and to focus on the water management issue. The expansion of gravity irrigated lychee & tea plantations creates water conflicts among villagers and the TAO could fund new water infrastructures.

- A **family of models** was gradually produced, each model integrating key relevant dynamics to support discussions among stakeholders at a given stage of the evolving learning process.

Results of the third ComMod cycle : a collective learning process

❖ Awareness of a problem to be solved collectively

- The first gaming session highlighted current conflicts due to the "first arrived first served" rule: after installing their water pipes, players did not allow others to get water from the upstream section (fig. 3).
- As in reality, only a minority of well-off farmers had access to water in the RPG.



Fig. 3. Gaming board (detail)

❖ Exchanges of perspectives on the problem

The non-threatening playful mode of interaction facilitated discussions on this conflict situation.



❖ Identification and negotiation of solutions

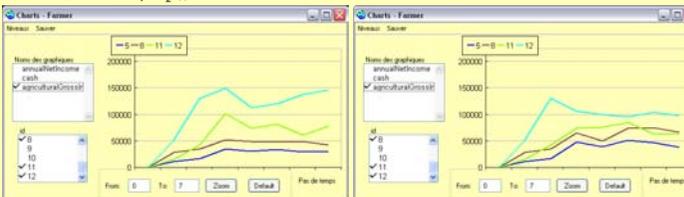
- Participants suggested to build small weirs on streams and to share water in groups of households. Players located above the stream did not agree but "had to accept" this proposition.
- Participants underlined the usefulness of a platform for a collective search of solutions in the village.

❖ Exploration of scenarios

- Players could assess the effects of suggested solutions through experimental learning.
- MAS-mediated participatory simulations triggered lively discussions about rules for water allocation and their effects on different beneficiaries (fig. 4).



CORMAS interface, <http://cormas.cirad.fr>



Rule 1: the amount of water provided is proportional to the size of irrigated plantation.

Rule 2: the same amount of water is provided to every farmer in the group.

Fig. 4. Changes in gross agricultural incomes of four households during simulations according to two sets of water allocation rules negotiated among a group of beneficiaries of a small weir.

Lessons and perspectives

- Much attention should be paid to conflicting interests and unequal influence among stakeholders when mediating the negotiation.
- The discussion between the villagers and the TAO President did not generate a genuine bottom-up dialogue. Institutional analysis and an initial agreement with local organizations on ComMod objectives & process could help to improve the dialogue with higher institutional levels of organization.
- There is a need to set up a continuous monitoring-evaluation of the effects of the collective learning and negotiation processes stimulated by ComMod (changes in perceptions, decision-making, practices, etc.).



A village representative presents a project to the TAO President.

Authors and institutions

Barnaud C.^{1,3}, Promburom T.², Bousquet F.³, Promburom P.² and G. Trebuil.

(1) Department of Geography, Paris X-Nanterre University, Nanterre; (2) Multiple Cropping Center, Faculty of Agriculture, Chiang Mai University, Thailand; (3) GREEN (Management of renewable resources and the environment) research unit, Cirad, France & CIRAD ComMod Project, Chulalongkorn University, Bangkok.

