Land-Water Linkages in Rural Watersheds Electronic Workshop

18 September – 27 October 2000

Case Study 4

Can participatory land use planning at community level in the highlands of northern Thailand use Geographic Information Systems (GIS) as a communication tool?

O. Puginier, PhD candidate at the Humboldt University Berlin
Bochumer Str. 19, D-10555 Berlin
e-mail: oliver.puginier@t-online.de)

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, Italy

PROBLEM BACKGROUND

The highlands of northern Thailand are a prime example for a conflict situation arising when a centralised government system with conflicting interests of forest preservation and integration of ethnic minorities extends its control to the remote areas, where traditional shifting cultivation practices clash with centralised planning. On the government side, after an initial focus on the elimination of opium cultivation in the 1970s, the main focus now lies on the restoration of forest cover and limited permanent land use to preserve forests (AMORNSANGUANSIN, 1992), with a minor emphasis on the official registration of hilltribe villages. Hilltribes on the other hand are looking for land security to first meet their subsistence needs, prior to modifying their traditional farming systems and investing in long-term agroforestry practices. The issue has thus become one of mediation and conflict resolution in order to overcome the apparent dichotomy between forest protection and agricultural subsistence. Any participatory approach for data collection and land use documentation is dominated by the following pressing problems:

- The forest cover in Thailand has decreased from 53% to less than 20% in the last 40 years, and there are no more primary forests (MAXWELL, 1997);
- At policy level the government has banned commercial logging in 1989 and has declared that under the National Forest Policy 40% of the country are to become forest again, of which 25% are to be protected forests and 15% production forests (AMORNSANGUANSIN, 1992), implemented through the means of a national watershed classification;
- The restrictive policy of forest preservation, while at the same time emphasising permanent hilltribe settlements and farming in a few tolerated pockets of land, has not reverted the overall problem of forest degradation;
- Shifting cultivation that has evolved over a long time cannot suddenly be changed to permanent farming without adverse effects on the land like shorter fallow periods and to lower soil fertility;
- During the same 40 years, the hilltribe population has increased from 200,000 (YOUNG, 1962) to 800,000 (NSC/NESDB, 1993), which has led to a rapid decrease in available land.

As laws alone do not protect the forests, highland development activities were shifted towards participatory approaches such as the Community Based Land Use Planning and Local Watershed Management (CLM) of the Thai-German Highland Development Programme (TG-HDP) in 1990 (ANONYMOUS, 1998). In order to protect forests, while at the same time supporting hilltribes in the transition towards permanent agriculture and residence, a participatory process of classification and mapping of natural resources at village level was initiated in Mae Hong Son province. The aim was an improved sustainable use of land, water and forests, a rehabilitation of watershed catchment areas and an intensified agricultural production on suitable land. One of the most useful visualisation tools became three-dimensional topographic models on a scale of 1:5000 in order to demarcate village areas including outer user boundaries for village registration, permanent cultivation areas, community forest areas for use and conservation/watershed forest areas for environmental protection.

RESEARCH METHODOLOGY

In order to go beyond the demarcation of land types and to carry this process up from village level to higher planning, the research project was initiated to combine CLM with GIS. The advantages and risks of participatory GIS for hilltribe farmers as the primary stakeholders and for government agencies are manifold, and the concept of a "Participatory GIS" has even been labelled an "Oxymoron" or contradiction in terms (ABBOT ET AL., 1998). This is based on the

challenge of combining participatory approaches with other methodologies, and for land use planning the key issue is the generation of visual information that is both intuitive and useful to the villagers who create it as well as to the government planning bodies. Of a particular challenge is the scaling up of information so as to show local concerns while at the same time being compatible with regional perspectives, or an integration of realities and detail into a very precise tool. The second challenge is one of decision making power through the ownership and use of data, as in the past this access was limited to a few high-level decision makers and thus constituted a merely extractive extension tool. These issues have also been considered in more detail for northern Thailand including areas settled by hilltribes by ICRAF scientists (SAIPOTHONG ET AL., 1999).

In order to go beyond the demarcation of land types and to carry this process up from village level to higher planning, the accompanying GTZ-funded research project was initiated to combine CLM with GIS. Given the pressing problems listed above and building on the CLM approach of the now closed TG-HDP, it was important to first document the achievements of the project and to integrate the evolved land use systems into a computer database that can be modified and upgraded when necessary for future planning as follows:

- Durable and easily transportable maps recognised by all parties;
- Aggregated information at sub-district level for regional planning;
- A tool that allows regular updating of land use data for the rapidly changing land use in the highlands.

The research was conducted in two of the three project areas of the TG-HDP, namely Nam Lang (renamed Pang Ma Pha when upgraded to a district in 1996) and Huai Poo Ling. The hand-drawn village maps were digitised using a hand digitiser into the GIS programme ArcInfo and then converted into maps using the map-drawing programme ArcView 3. The roads and streams, as well as the sub-district boundaries for Huai Poo Ling were obtained from the Survey section of the Northern Narcotics Control Office (NNCO) in digitised form and overlaid with the remaining data. The different land categories were then colour coded using the same colours as on village maps. For the area calculations the corresponding polygons were added up. The same procedure was carried out at Sub-District level for Huai Poo Ling, and the data for the 10 target villages aggregated into one map.

Once the maps had been digitised and printed, they were taken back to villages for modifications or corrections, with the aim to later distribute them in plastified A1 size to villages for longer term use. Digitised printouts can also be distributed to other agencies and can be taken to network or district meetings to discuss land use issues. Maps were also distributed to district forest officials to facilitate their work in land use monitoring. The data and the GIS software were then transferred to the Survey Section of NNCO as well as to the ICRAF office in Chiang Mai that collects this data for the whole north of Thailand.

RESULTS

An assessment of the results needs to briefly recapitulate some achievements of the CLM approach (JANTAKAD and CARSON, 1998):

- Rules and regulations for the management of the natural resources have been created and strictly followed by villagers, especially with regards to the harvesting of forest products and watershed protection;
- The Tambon and network organisation situated in the same watershed area or sharing similar resources, have improved their management capabilities;

- The integration of traditions and cultural practices related to natural resource conservation, such as *tree ordination*, has increased the level of community involvement;

The TG-HDP has had a significant impact on the transition of agriculture, on community development and on the working relationship between hilltribes and government agencies. For the sake of brevity, the impact at individual village level shall be left out and only the effects and relevance of digitised mapping for Tambon Huai Poo Ling are discussed. The provincial office gives the total area of Huai Poo Ling as 37,152 ha. As far as land use planning is concerned it is important to note that there are overlapping areas claimed by adjacent villages, which may lead to conflicting claims over its use. In most cases this land lies in conservation forest areas, which means that the total forest area claimed by each village is actually less when aggregated to Tambon level.

The total upland area of 6,200 ha makes up some 17% of the whole Tambon area, or with perennial crops paddy fields and land used in the last three years amounts to 7,600 ha or 20% of the Tambon. The total mapped forest area amounts to 14,700 ha or 40% of the Tambon, but as only 22,500 ha of the Tambon have actually been mapped, the fact that 65% of it is conservation forest is more significant. This by far exceeds the target of 25% protected forests set by the Royal Forest Department (RFD) nation-wide. According to own calculations the area cultivated each year has increased from 100 ha (1.3%) in 1995 to 700 ha (9.2%) in 1997, a rather sharp increase that needs to be verified. It is obvious that the aggregated data has a relatively high level of inaccuracy, but the most important relation for planning purposes is that between conservation forest and upland area, and the figures show that the forest cover in Huai Poo Ling is very high while only a small area is burned and cultivated every year. Compared to totally deforested areas in the Northeast of Thailand, the highland areas of Mae Hong Son are well forested and shifting cultivation only has a small impact on the environment.

CONCLUSIONS

On the technical side, the national goal of forest cover has definitely been achieved in Mae Hong Son and the watershed classification needs to be reviewed to take into account the many permanent settlements. Maps are essential for natural resource management planning, as can be seen by the fact that the maps produced for this paper are being used by the newly forming Tambon Administrative Organisation (TAO) representatives at provincial level in Mae Hong Son in a petition to be submitted to the Parliament for the recognition of highland farming systems.

After the closure of the TG-HDP in September 1998, the complex process of participatory land use planning is seriously threatened by the politics of the new Governor of Mae Hong Son province, who only allows 2-year fallow periods on uplands and only 2 upland fields per household. Farmers overstepping this limit have been arrested. Additionally, RFD has the permission to confiscate fallow land with trees that have a breast diameter of more than 10 cm to declare it permanent forest, yet none of these measures are backed up by RFD policy (the only official regulation is the outdated watershed classification according to which all highland areas are forests). This new development undermines the achievements to date and calls for a clear position of the government towards land use in the highlands.

The process of participatory mapping and planning is gaining more and more acceptance by development agencies in Thailand, though not yet in terms of policy, as the hotly debated Community Forestry Act shows, which has been discussed since 1991 without conclusion (AMORNSANGUANSIN, 1992). In an effort to update forest policy, a Forestry Sector Master Plan was developed with Finnish and United Nations assistance in 1993, yet it has not been ratified by parliament. The recent revocation on 30 June 1998 of three resolutions passed in April 1997

granting settlement in forest areas occupied prior to 1993, shows the uncertainty as to whether participatory land use planning really has a chance in Thailand. Even though the political backup for this process is still missing, various organisations are working with participatory mapping and planning approaches at different levels, and Non-Governmental Organisations (NGO) as well as informal farmer networks are gaining more and more importance. The furthest steps have been taken by the NGO, CARE, in its Integrated Natural Resources Conservation Project in Mae Chaem district of Chiang Mai (ANONYMOUS, 1997). The establishment of Village Forest Conservation and Watershed Management Committees, in which government and village representatives are members and sign land use agreements, is the only case known where written documents exist. These have given highland farmers the necessary confidence that their land management systems are indeed endorsed by the government and should serve as a model to be followed.

There are still some technical difficulties with the use of GIS in the documentation of land use, particularly with a lack of processing facilities for updating in Mae Hong Son province. However, the greatest stumbling block is definitely the still unclear government policy for the highlands that allows for the above counterproductive developments. Yet given the meanwhile strong peoples' movements in Thailand, it is hoped that such problems are only of a temporary nature on the road to progress.

ACKNOWLEDGEMENT

The author is grateful for the PhD grant from the GTZ Tropical Ecology Support Programme.

REFERENCES

AMORNSANGUANSIN, J. (1992). Thailand Forest Policy and Extension. In: Local Organisations in Community Forestry Extension in Asia, FAO Field Document 34, Bangkok

ANONYMOUS (1997). Integrated Natural Resources Conservation Project (mid-term review). CARE Thailand, Bangkok

ANONYMOUS (1998). Review of TG-HDP's Agricultural and Forestry Programmes, 1984-1998, Internal Paper No. 212, Chiang Mai, volume 1 (54 p.) and 2 (137 p.)

ABBOT, J., ET AL. (1998). Participatory GIS: opportunity or oxymoron?, PLA Notes 33, pp. 27-34, International Institute for Environment and Development (IIED), London

JANTAKAD, P. and CARSON, S. (1998). Community Based Natural Resource Management from Villages to an Inter-Village Network: A Case Study in Pang Ma Pha District, Mae Hong Son Province, Northern Thailand. Paper presented at the Community Based Natural Resource Management Workshop, World Bank, Washington DC., USA. May 10-14, 1998

MAXWELL, J.F. (1997): Brief History of Northern Thai Forests: Present and Future. Presentation at the Informal Northern Thai Group meeting on 8 April 1997, Alliance Française, Chiang Mai

NSC/NESDB (1993): A Directory of Highland Communities and Population. National Security Council and National Economic and Social Development Board, Bangkok

SAIPOTHONG, P., WEYERHÄUSER, H. and THOMAS, D. (1999). Potential of GIS for Local Land Use Planning: a Case Study in Mae Chaem, Northern Thailand. International Centre for Research in Agroforestry (ICRAF), Chiang Mai University

YOUNG, G. (1962). The Hilltribes of Northern Thailand. Ams Press, New York (Reprinted from Siam Society Monograph No. 1, 19662