Sustainable Initiatives

Information and Communication Technology case study

Mobile Interactive Geographical Information System (MIGIS), China

GIS for NGO development projects

Introduction

This case study has been generated as part of a research programme into Information and Communication Technology (ICT) sustainability factors. Funded by the Department of International Development (DFID), the research programme identified activities that sought to benefit the poor and had an ICT component. In particular it considered programmes where ICTs had enhanced ongoing development activities, the ICT activity could be replicated without sizeable investment, and there was a measure of sustainability. Sustainability was taken to be more than financial cost recovery. Drawing from lessons learned in other development sectors, sustainability involves a combination of factors including among others, clear objectives, institutional frameworks, local capacity and development benefits. While perhaps not fulfilling all the features of a strong sustainable activity, the following case was felt to hold points of interest for the wider global development community.

Description of case Study

MIGIS is an approach to community based planning that uses a Mobile Interactive Geographical Information System (GIS) in conjunction with, and fully informed by, Participatory Rural Appraisal (PRA). MIGIS relies on community support and muted expert facilitation. It is designed to bring the best of indigenous knowledge and scientific information together to provide common ground on which farmers, government administrators, and planners can optimise their understanding of each other and work as a team to plan for a better future… Stated as simply as possible, MIGIS works by transferring graphic information gathered in Participatory Learning and Action (PLA) exercises into computer program format. As quickly as possible this is projected on to a screen in front of the whole community for discussion, correction and critical comment. The PLA exercise is written up during the exercise and the results presented to the community before the MIGIS facilitators depart (John Mackinnon).

The idea behind MIGIS is to provide computer supported back up for a PRA exercise in which farmers can carry out an evaluation of their environment and socio-economic situation, and in consultation with outside government officials and scientists acting as facilitators, devise a series of action plans designed to enable them to pursue a strategy of sustainable growth. Devised in the early 1990s in connection with Rapid Rural Appraisal (RRA), MIGIS was abandoned for ten years until funding could be secured and key people found.

Experience to date of using the technique across South East Asia has found that it is possible to do good PRA and enhance the presentation of the participatory studies in a manner which only seems to empower the voice of those to whom the information belongs. To restrict people to scrabbling in the dirt and playing with sandcastles is not what appropriate technology is all about. Through MIGIS, with the emphasis on the visual presentation of information, we have found that we can extend PRA into a wide reaching dialogue between outsiders and locals. The example used here comes from a feasibility study, commissioned for the period Jan 1999 to June 2000, in Xiashapu and Shangshapu villages, Luchan County, Yunnan Province, China.

(Information taken from http://www.geo.vuw.ac.nz/geography/projects/migis/index.html)

Key Strategies

To provide computer supported back up for a PRA exercise in which farmers can carry out an evaluation of their environment and socio-economic situation, and in consultation with outside government officials and scientists acting as facilitators, devise a series of action plans designed to enable them to pursue a strategy of sustainable growth.

Photo 1: Carrying out a PLA exercise

Development benefits

Through the MIGIS study community action plans and a report were produced which can form the basis for development intervention in the study villages. In the MIGIS report, a strong case was made for development intervention in both villages. This was based in two negative and one positive factors:

Environmental degradation caused largely by the loss of a protective forest cover leading to rapid run-off, heavy erosion, aggradations of waterways, loss of irrigated fields and falling groundwater yields was reaching a critical stage.

Absolute poverty documented by shortfalls in food production and lack of reliable cash crops.

Positive social capital represented by the willingness of farmers to prepare ameliorative action plans (construction and planting) and offer their own labour to carry out work has created a milieu with development potential.

Hindrances

Technical:
All the hardware and software worked well with the exception of the digitiser that powered down every 15-30 mins. One of the six laptops carried by the team crashed, losing all data on the hard drive. As most of this was backed up on disk, little time was lost.

It had been hoped to use local icons on all the maps and illustrations. While it was possible to create icons from farmers' drawings, when placed in close proximity to each other they tended to mask each other and the underlying information, producing a very unsatisfactory result.

Locally sourced power extension cords proved to be very thin, were not waterproof, and tended to break easily under the tough field conditions.

Socio-economic
Only two members of the team had worked together before and so it took time to learn about each other's specific skills.

What helped it Succeed

Technical:
With regards to the ICTs used, good planning for lack of electricity and a back up system ensured that the study was able to deal with the lack of electricity and any computer glitches.

Computer graphics enabled the information to be presented in both written and picture form. Enabling the team to get around the illiteracy constraint and increase its accessibility to the target group.

Socio-economic:
The use of advanced technology added a level of accuracy and credibility to the study that attracted the interest of government policy makers and planners.

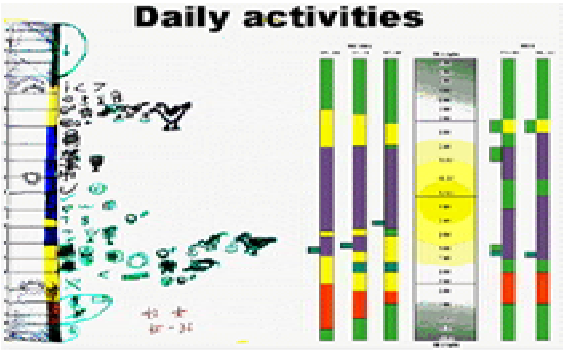
Sustainability factors

Objectives

The goal of the MIGIS Feasibility Study was to make a significant contribution to the quality and effectiveness of participatory planning; by introducing the use of GIS and advanced graphic techniques into the PRA process; and, using the images produced in a way that would enhance the presentation and therefore the authority and impact of information collected in and provided by communities in which development intervention was planned.

Objectives of the MIGIS Feasibility Study were to:

- Establish MIGIS as an advanced mode of participatory intervention for use in rural development planning in the highlands of the Upper Mekong Sub-Region.
- Transfer MIGIS skills to our Chinese partners so that they can use the techniques to carry out subsequent development exercises of their own.
- Train counterpart researchers and planners in a range of Participatory techniques.



- Learning and Action techniques, specifically PRA, which they can competently use in the course of their own work.
- Secure the full support of a typical highland community in the facilitation of a MIGIS/Participatory Rural Appraisal exercise which will result in the preparation of a study report they accept as their own and which includes an appropriate set of action plans.

Institutional arrangements

The MIGIS study team was comprised of **Dr Ma Huan-Cheng** Associate Professor in forestry and soil science, Southwest Forestry College, Kunming; **Dr Jack McConchie** Senior Lecturer in hydrology and goemophology, Victoria University of Wellington; **Ms Jean McKinnon** consultant; **Ms Cai Kui** Researcher, (RDRC) Development research centre, Kunming; **Dr John McKinnon** Reader in Development Studies, Victoria University of Wellington. And three Government officers representing the counterpart agencies, who underwent intensive training in the field, one representative from the Honge Institute of Minority Studies and two field officers from the Environment Protection Bureau.

Following a successful technical field trial in a Karen village in Thailand (June 1997) KINSA and RDRC decided to work as partners to pursue Chinese government support and NZ Asia DAF funding to mount a full-scale feasibility study. Over the next 18 months this was expanded to include the Environmental Protection Bureau, with the field site was shifted from Jianshui to Luchun County.

Target groups

The target group was chosen though contacts provided by the Environmental Protection Bureau in Hani. They identified villages in which they wanted work carried out. Final approval for this choice was communicated in advance of the New Zealanders arrival to Ms Cai Kui (RDRC) and Mr Li Qibo (HIMS) by the leaders of Xiashapu and Shangshapu villages.

The main target group are the members of the two villages, Xiashapu and Shangshapu. But because this was a feasibility study, the target area can be expanded to all those villages that will benefit from future MIGIS projects. Because the entry into the village was managed by EPS this automatically gave the team an honorary official status. As the feasibility study was carried out the target groups began to relax towards the study team.

Photo 2: Transferring the data onto computer

As one of the objectives of the project was to ensure that the communities see the end report of the MIGIS results as their own, their involvement was essential. The villagers were very cooperative, and despite the fact that this was a busy time in the agricultural cycle, they helped as much as they could.

Before the study the Target group had little, if any ICT capacity. Then because of illiteracy issues and the obvious language problems, the villagers were asked to compile a list of symbols/icons to be used in the graphical interpretation of the results.

Technology

The team took with them a Laptop, roll-up digitiser, digital camera, a video projector a scanner and a generator to provide a reliable source of power.

With regards to software they mainly used ArcView (ver 3.1) with Spatial Analyst extension and Idrisi (ver 2).

When producing the reports the inability of some of the software to print Chinese characters created some minor problems. The simplest solution to this was to produce blank fields in maps and diagrams

Anecdote

In the process of preparing their Action Plans farmers declared a willingness to volunteer labour for reforestation. The MIGIS recommendation that they look at planting riparian buffer zones, presented in Part II of this web site, could not be explored with the farmers. Such work would fit nicely into any extension of the EU-China project. A chance has been opened up for both parties, the villagers on one hand and the Environmental Protection Bureau on the other to negotiate a mutual action programme.

Points of Interest

The use of GIS technology enabled highly accurate and geo-referenced maps to be compiled in a short time and checked by farmers. Through this farmers were then able to read and understand the maps and comment on their accuracy.

The use of this technology with PRA allows villagers themselves to track changes over time and work out possible effects of future actions.

Findings showed that the technology did not create barriers to women's participation and men and women farmers were equally engaged in all stages of the work.

that could be labelled by hand. This was time consuming. In future software should be checked for this difficulty.

Finance

Grant of NZ$267,290 for the MIGIS feasibility study from the secretary of foreign affairs and trade.

NZ$2391 spent on the PRA workshop
NZ$12,079 spent on ICT equipment

The project process

The PRA exercises were initially carried out by representatives from each village working with the help of a few self-selected participants and casual passers-by. Prescriptive exercises were a more significant part of the MIGIS exercise than in a normal PRA. The data focus placed an extra demand on participants but this did not appear to place a damper on farmer support, if anything it added to the challenge. The PRA process was carefully monitored throughout the study.

Feedback sessions were difficult to organise. Because of the timing of the study, which coincided with the beginning of the planting season, there were usually too many things going on to allow for a considered response.

At the end of the field work phase, Mr Bi, the director of the Honghe EPB, undertook to follow up on two of the village action plans: Xiashapu, tractor road; and Shangshapu, domestic water supply

Key linkages

HIMS saw the MIGIS project as a chance to extend their international connections and make a contribution to development work. MIGIS was to train a group of their researchers in PRA so that they could undertake work for development agencies and make PRA a part of their literacy training programme. Initially HIMS was to be the principle counterpart, but due to lack of staff, the Environmental Protection Bureau was taken up as a de facto counterpart.

National linkages were initially made with KINSA and VUW, RDRC and the Bureau of Foregn Trade and Economic Cooperation (BOFTEC).

It was out of the good relationship formed between the MIGIS originators and the RDRC that resulted in the joint undertaking. RDRC built up a good understanding on the Chinese side and the NZ MIGIS team pursued funding from the Asia DAF.

Intermediaries

The PRA exercise provides the communities with an analysis of their development needs and an appraisal of how these might be met. The report in which this information is compiled provides the community with accurate and authoritative material to negotiate development inputs with appropriate agencies.

Stakeholders consulted

This case study information has been gathered through reports and information generated by MIGIS staff on the pilot case study. This includes the MIGIS website, a MIGIS Report: "Incorporating the PRA reports for Xiashapu and Shangshapu Villages, Luchan County" by McKinnon, J et al June 1999and a MIGIS: "A feasibility study to strengthen Participatory Appraisal and Planning Capability" by McKinnon, J et al June 1999)

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