

## ORGANIC FARMING

Re-evaluating indigenous farming systems of the northeast





## **Mapping Tribal Lands**

India's first community built 3D map in Garo hills for natural resource management



## Mapping tribal lands, resources

With participatory 3-D Modelling, planners can implement better community resource and land-based programmes, writes Sanat K Chakraborty

THIS IS THE BEST GIFT that they have offered to us. They are God-sent," Ganoth Sangma, the Nokma (the clan head) of Sasatgre A.king (village), profusely thanked Dave De Vera and his Filipino team members, who had helped the community build a 3-Dimensional model of their village and the neighbourhood in May last year.

"It's unbelievably wonderful!"
He exclaimed as his eager eyes raced
over the landscape on the model.
And then he paused a while to point
out at something on it.

"Where is the hill?" the Nokma anxiously asked, bending over it. "There should be a hill here that forms the traditional boundary between us and Rambhadingre," he said. "How come it is not showing on the model?"

Nokma allocates jhum fields on 3D at Sasatgre



De Vera was not at all surprised. He was rather happy that the Nokma could identify the missing space on the model. "That's precisely why the participatory community mapping has become a very useful tool for solving many land-related problems," he said, explaining the rationale for making such a 3-D model for a better understanding of the physical landscape of the area and the natural resources that the community solely depends on. It is difficult for the unlettered and the uninitiated people to derive information from the general two-dimensional (length and width) maps. After all, maps are often considered the domain of

the experts, the only ones who can interpret the geographic and spatial information required for designing appropriate land use and resource management plans.

But both these maps and topographic sheets could be misleading, as it happened in case of Sasatgre, De Vera observed. The 3D relief model of Sasatgre was built as per a selected base map at a 1:5000 scale blown up from a topographic map. Any topographic map contains spatial information such as, contour lines (representing distance, altitude, slopes etc.), water bodies, deep forest and watershed areas among other landmarks.

It is possible that because of the variation of scale, the details of the geographic information (in this case the hill that the *Nokma* had referred to) may not have been registered in the topographic map. "And therefore, while making the Relief model, the hill got lost." But then, this is how the community knowledge of its land and surroundings becomes handy to overcome this missing link, De Vera said.

In fact, in recent years, the Participatory 3-D Modelling (P3DM) has emerged as a very useful tool for community land use and resource management planning processes because it integrates people's knowledge (informal and perceived) and the spatial information (formal and scientific). This has been possible due to rapid expansion of the Geographic Information Technologies (GIT) and other geographic information gathering devices such as, satellite-aided GPS (Global Positioning System) and digital soft wares that enable even non-experts in strategic development planning.

GIT and GIS-guided tools have helped in broadening its applications beyond the specialized frontiers of strategic planning, bringing it down to the community level, the domain of the commoners. The Phillipines and Thailand are two South East Asian countries, which have extensively used this multifaceted technology to address a

host of complex issues related to land rights, control over the natural resources and their management.

De Vera and his team — Randy Abeto (GIS mapping trainer), Raquel Zingapan (GPS trainer) and Nicasio Caslangan (3-D mapping trainer) of the Philippines Association for Inter-cultural Development, Inc. (PAFID), have been involved in several projects, particularly the 'ancestral domain' mapping to redress the claims of indigenous groups in their country.

It was therefore thought that P3DM could be tried as a pilot project in India's northeastern region where an IFAD-supported community-based natural resource management project (NERCRMP) Senapati districts of Manipur. Unlike in many areas of India, in the northeast region the key natural resources of land and forest are controled by the communities living in the area. The state government has little control over those critical resources. But despite the community control — a collective of customary individual holdings — over local resources, the farmers remain most vulnerable to poverty and diseases.

The NERCRMP was conceived on the premises that (a) economic conditions in the hills can be improved by drawing up appropriate land use and natural resource management plans and effectively executing them; and (b) that the existing community institutions and





had been launched about five years ago. The PAFID and the Kathmandu-based International Centre for Integrated Mountain Development (ICIMOD) offered to conduct a hands-on training for the community leaders and the project staff in the northeast.

Sasatgre in the West Garo Hills of Meghalaya is probably the first Indian village where the P3DM tool is being used to build up local expertise in making better land use and natural resource planning and management practices. And it appears to have caught the imagination of the rural development planners, local administrators and the community leaders.

The Rs.140-crore IFAD-GOI project is being implemented in the six hill districts — Karbi Anglong and North Cachar hills of Assam, West Garo hills and West Khasi hills of Meghalaya and Ukhrul and

leadership regulating the community activities can be used for developing economic programmes, and implemented by enhancing the local capacities and building on the traditional knowledge systems.

In other words, the project envisaged an 'alternative' development model that is drawn up through a participatory process at the community level where the primary resources are located and controlled. The existing government community and rural development (C&RD) schemes, most of which are centrally-sponsored, are delivered through a long administrative network that often fails to reach the target groups at the village level.

During the last five years, the project is said to have established direct links with as many as 600 villages in the region, and created new institutions and ideas through social mobilization, regular interac-

tions and training to implement their programmes. With the two new community-based institutions, the Natural Resource Management Group (NaRM-G) and the Self-Help Group (SHG), the villagers are being trained to address a whole range of issues related to land-use and natural resource management as well as the microcredit requirements of the community.

In the NaRM-G and SHG meetings, generally held twice a month, the villagers openly discuss their needs and opportunities, and prepare action plans according to their own priorities. The project support team conducts training and exposure programme for the members so that they learn to interact with the various government departments, block development officials, banks and marketing agencies.

"The community institutions are working fine," claimed Daisy Marak, the Institution Development Officer (IDO) of the project. "They are not only implementing various state-sponsored development schemes, such as building village roads, culverts, community halls, but also maintaining the community infrastructures," she said. The NaRM groups have also brought about a certain degree of discipline and transparancy in the community activities. For example, recently one of the management committee members of the NaRM group was forced to resign from the post, after the community found him indulging in financial mismanagement. He had bought a second-hand jeep for himself with the community fund that was earmarked for the citrus rejuvenation programme.

One of the major challenges faced by the community has been the non-remunerative agricultural practices —the shifting cultivation— followed by the highland farmers. "We cannot give up jhum," said Wedilin Marak, the general secretary of one of the NaRM groups at Sasatgre. "This is the only source of our livelihood, even though we are finding it (carry on

with jhum) difficult to manage."

"Land is there, sufficient for us at Sasatgre," Wedilin agrees, as it is in many other parts of the Garo hills. "But it is not possible to cultivate as much area as we want because of lack of labour. Weeding is a major headache," he sighed. How much can one clear up? So, weeds spoil the crop, bring down the yield.

"The issue is how to draw up better land use and resource management plans," said Parry. R. Marak of the project. And this is where the P3DM comes in as a tool for survey and re-organisation of land use and management plans in an area, particularly for the management of the jhum fallows and putting them to better use. "The people of Sasatgre have begun to



do just that," he said.

Last November, the people of Sasatgre allocated their new jhum plots based on the relief model for the next jhum cycle that begins every March (for 2004-05). "This time, we could think better ways of jhum plot allocation by identifying the area on the model," the *Nokma* Ganoth Sangma said.

He said the community could also bring all the jhum plots within one compact area, thereby reducing the areas to be cleared for jhum. The model offered better visualization of the landscape and land use plans. Some of them have also decided to cultivate a plot for two successive years instead of one-year-one plot basis, as it had been followed all through the years. "This way, we will be able to leave more area for fallows and forest regeneration," the *Nokma* said. Besides, he said, with the help of the model,

the community has been able to draw up new land use plans, and forest conservation activities.

The Sasatgre experiment has inspired other villages in both the West Garo hills and West Khasi hills to replicate the model. "We have built four more 3D models for Bawegre, Sadolpara, Babudam and Duraasim villages in the Garo hills," said Parry. Two models have also been built for Tynnai and Nonglang villages in the West Khasi hills.

However, P3DM that offers multi-use information may create new problems too. In the Khasi hills, the geographic information brought out on the 3D model appears to have stirred up local anxieties between the two villages. At Tynnai, when the community was building the 3D model, the people from the neighbouring village objected, asking the Tynnai villagers not to show the neighbour's land on the model. Because, they said they did not agree with the village boundaries.

Of course, the project trainers said the protests were raised because of the communication gap between the two neighbouring villages. But, later "with proper consultations and participation of both the villages, all doubts could be dispelled," said Shan Phanbuh, the project manager of the West Khasi hills.

Similar situation is faced by the Sasatgre villagers over a stretch of land between them and the neighbouring Rambhadingre village. Several meetings were organized to bring the two sides together for negotiation. "The model will certainly help promote better understanding of the landscape and the claims over it," Daniel Ingty, the Garo hills project manager felt.

The Sasatgre experiment will continue to be avidly watched as one of those landmark pioneering projects where a marriage between latest scientific tools and traditional knowledge seeks to change rural lives for the better.