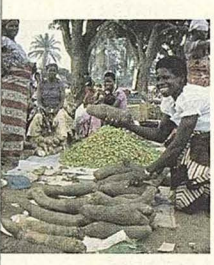
Diagnostics of sorghum-based cropping systems are performed in order to assess farmers' need for sorghum varieties. To achieve this, sorghum populations are developed from local genetic resources and evaluated in situ.

Expected results are an inventory and characterisation of local varieties and genetic erosion mechanisms, and an improved knowledge of sorghum biodiversity in farming systems, as well as its spatial distribution in ecosystems. Also studied are socio-economic constraints, characteristics of traditional seed systems, and social factors in the adaptation and distribution of varieties. With stronger farmers' organisations and knowledge of the consultation procedures used among stakeholders in the sorghum commodity chain, strategies for the conservation and use of sorghum biodiversity can be improved.

Preliminary results have been achieved with a number of accessions collected and assessed in Mali and Burkina Faso and with analysis of the main cropping systems. Several populations of sorghum are currently being monitored in situ. The researchers have also shown that a spatial model accounts for the relative abundance of varieties in local areas, and that varietal diversity is not managed at farm level but within groups of farmers exchanging seeds.



• There is a large number of cultivated yam species and some have been "domesticated". In Africa, producers find and farm wild species that meet their requirements. In some cases, they obtain new varieties directly from the wild stock. Scientists try to understand farmers' practices and the relations between wild and cultivated yam species.

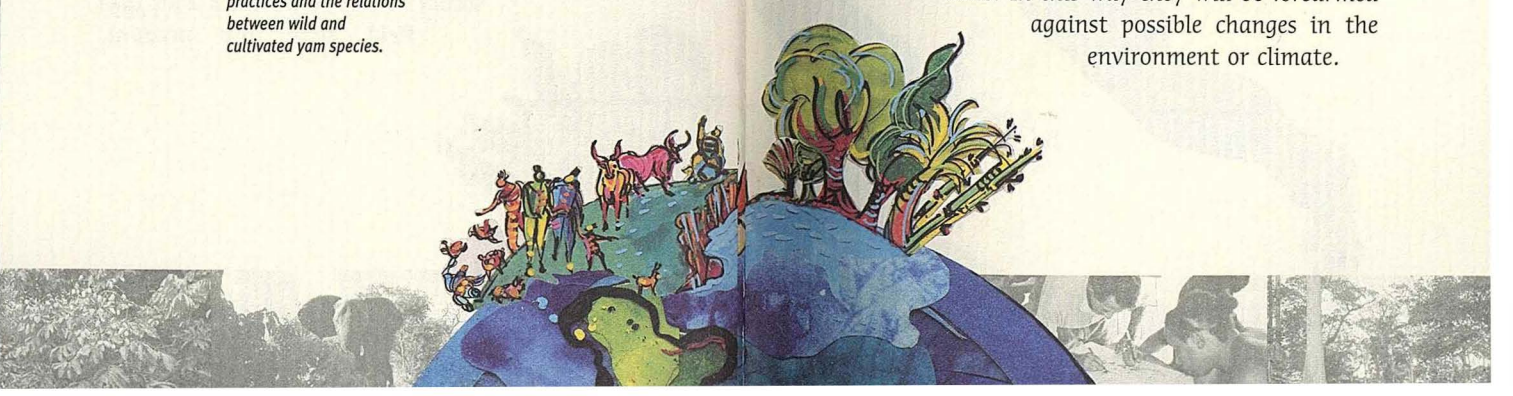
Dynamic management of agrobiodiversity in root and tuber crops

While yields of major cereal crops have reached a ceiling, roots and tubers such as cassava, sweet potato, yam, taro and macabo offer promising prospects for food security. Grown on small plots by the poorest farmers, they are found everywhere in the intertropical zone, but there are few representative collections of their genetic diversity. There is a risk of genetic erosion, and farmers will need to manage the agrobiodiversity of these crops dynamically.

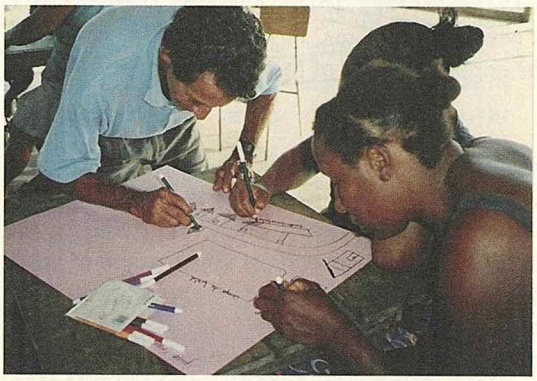
Subsistence farming in the South Pacific is based on root and tuber crops. In Melanesia, consumption of fresh tubers is the highest in the world: 350 kg per person per year. Melanesia is also a region of great genetic diversity, both for the number of species and for the number of cultivars per species. Some species are endemic, others were introduced when the first contacts with Europeans were made. Melanesian farmers do not sow seeds because the varieties they grow are sterile and are propagated vegetatively; this makes them vulnerable to environmental changes.

The project CIRAD is taking part in Vanuatu aims to establish an agrobiodiversity management system for nine root and tuber species, run by farmers. It proposes dynamic management rather than static conservation of existing genetic resources. It does not have the constraints in situ collections suffer from and it offers a partial solution to the narrow genetic base existing in plantations.

The proposed research objectives include recording local knowledge, inventorying existing varieties and their genetic diversity, participatory assessment of varieties and working out a methodology that can be used in other countries. It is hoped that by the end of the research, the farmers will possess an abundant allelic diversity that will enrich their range of varieties without endangering existing ones. In this way they will be forearmed against possible changes in the environment or climate.



Participatory mapping



• *Natural resources participatory mapping. Protected areas management plans are prepared and discussed with local populations (here in Brazil and Bolivia).*

Interactions between biodiversity and society in maps

• *Mapping interactions between biodiversity and society in Amazonia. Amazonian spatial dynamics result from two territorial strategies (top). One is an East-West colonising movement of farmers along the valleys from the Andean side, with decentralised urban centres appearing and exploitation of the oil-bearing piedmont fringe. The other is migration in the opposite direction, West to East from the coast, with a pioneer front and penetration by river (north) or road (south). Pockets of subversion are developing in less accessible corners. These flows overlie a web of biodiversity areas and indigenous peoples' territories.*

The mosaic or network pattern of protected areas (bottom) makes it possible to integrate biodiversity management with these spatial dynamics (SNUC, Brazil).