

Technical Tools

Despite increasing attention, little is known about the actual extent and spatial distribution of urban agriculture in inner city areas. Questions need to be answered about the concentration of urban agricultural activities and the reasons for this concentration. The application of any tool requires community participation. The strength of any community lies in its existing network. In the context of planning methodologies this means the need for development of human capital capacity, which is mainly achieved through formal and informal training and education (Nell & Wessels 2001).

The most commonly used planning tools include *master plans*, *strategic plans* and *structure plans* (Dowall & Giles 1997), while zoning measures are part of those plans. Experience has shown that general and master plans tend to be static, prescriptive or assume slow-growing cities and as such cannot accommodate dynamic settings. They also tend to ignore changes in demand for land and price fluctuations (Van den Berg 2000). A more appropriate and dynamic planning tool for developing countries is *structure planning*. It provides a broad framework for local decision-making and involves public participation. Being more indicative than master plans, it requires projections of future demands and needs of the community such as housing, infrastructure, employment, transport, local markets, etc., but also environmental aspects like waste management. *Land zoning* dictates the purposes for which the land can be used and what can be built on that land. Zoning regulates the use of land in areas for residential, commercial, industrial, agricultural or other land use (Dowall & Giles 1997). Zoning is a means to control urban sprawl, population density, traffic, and other urban problems. Mixed zoning must be applied to the clustered type of development, especially, where working sites and residential

areas are planned together; for instance, the spontaneous squatter settlements at city peripheries in many developing countries, where housing, small-scale industries and agriculture are located in proximity to each other.

LAND MARKETS AND POVERTY ALLEVIATION

Land tenure and land security, rather than the availability of land, are the central to poverty alleviation, as pointed out above. Nevertheless there are big regional differences regarding the available space in cities, the prices of land and land tenure regulations. The key question is how to have the poor participate in the formal land markets (Fernandes & Varley 1998). Past approaches of poverty alleviation took into account the flexibility of the poor, which led to dependence on the government and non-governmental organisations (Dowall & Giles 1997). Urban planners tackle this question in the context of housing schemes rather than agricultural land use. Sometimes we need to take valuable existing

thinking and strategies as a starting point. Site-and-services schemes and squatter settlement upgrading are common measures taken by councils to provide or improve housing for the poor.

Site and Service Schemes provide the target group with a plot and basic infrastructure like water, roads, and sanitary facilities. Upgrading of squatter settlements provides an opportunity to build on existing structures, already partly developed, and does not interfere with well-established communities and social structures.

Land sharing is based on an agreement between the landowner (private or state) and the land occupants to develop the land according to their specific interest. Land sharing is a means of increasing land tenure security and land value and can be considered a specific form of leasehold (Dowall & Giles 1997). To avoid land speculation, the status of agricultural land in cities should remain public land, with

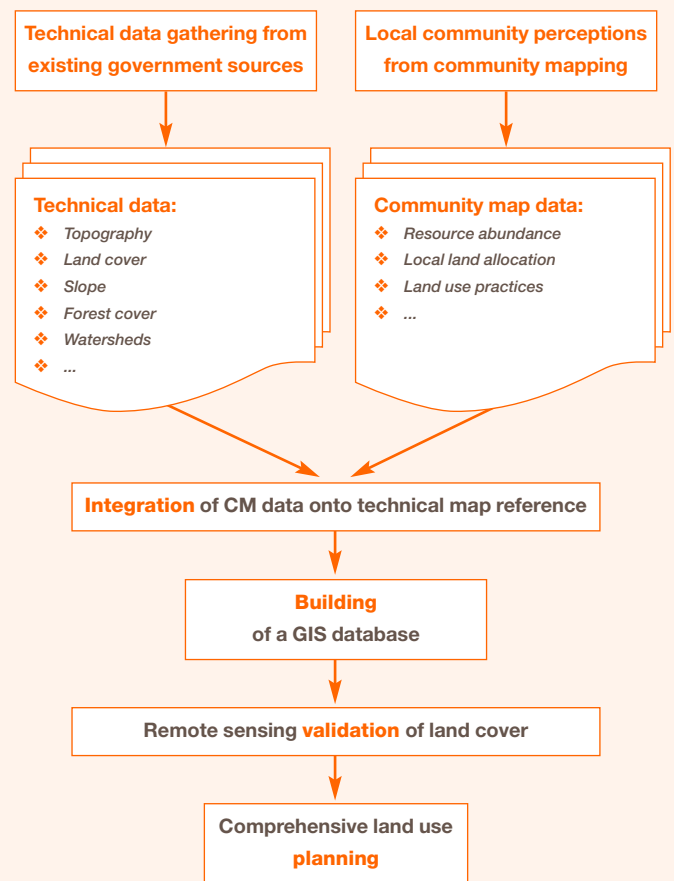


Figure 1 (from page 32): Methodology chart of community resources management

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long-term leases. Efficient protection of inner city open spaces is required.

GIS AS A TOOL FOR LAND-USE PLANNING

Geographical Information Systems (GIS) have been widely used for urban planning purposes, but open-space management has hardly ever been included. The use of Remote Sensing (RS) for mapping and monitoring urban and peri-urban green spaces facilitates the mapping process but needs to be combined with true ground data evaluations. Some limited experience with the application of GIS to urban food production activities has occurred. GIS are used for urban planning and open space mapping but also for monitoring the loss of agricultural land within city boundaries, or measuring urban greening indicators (Fazal 2000). GIS can allow planners to monitor changing urban food production trends more easily as cities continue to undergo rapid changes (Dongus & Drescher 2000). Nevertheless, institutional difficulties in planning become apparent through the use of RS. Efficient planning requires the linkage of different data on space, infrastructure, markets, nutrition, health, soils, water, waste, socio-economy, agriculture, etc. that operate under the responsibilities of different, un-connected departments. Furthermore, the technical equipment (data, computers, plotters, computer networks) and know-how in the use of RS is often missing. The use of RS and GIS to increase participation in the planning process remains a challenge (Nedovic 1999).

SOME AREAS WHERE GIS CAN BE USED AS A TOOL

Situation Analysis

GIS is an ideal tool to visualise the spatial distribution of urban agriculture in the cities, as well as changes in the space it occupies. With the help of aerial pho-

tographs, especially using series from different years, land use changes can be documented and analysed. Situation analysis may also include a resource inventory of water, soils, vegetation, services, micro-enterprises, institutions, and other relevant data. This activity can be done on different levels. Land tenure and land use arrangements are critical with respect to sustainability. Cooperation with local communities requires tools for community research, one of those being action research. Action research can be used in situation analysis to draw community maps using the capability of local communities to visualise their situation.

Needs and Vision Analysis

Needs analysis, using GIS, requires the participation of the local communities and is part of community based mapping. A vision is developed together with the communities on how they expect the future to be – where they want to produce crops and animals, what minimum areas they need, how they would like to have their situation improved, which conflicts need attention and what role spatial planning could play in the future to avoid further conflicts. Needs analysis may also include stocktaking of community demands for space for agricultural production, including demographic factors influencing development (birth rates, population growth, influence of AIDS and HIV, etc.).

How to integrate community mapping into the formal planning processes

Community mapping allows for an analysis of demands and constraints of local communities to be considered in the (municipal) planning process, and which can be combined with the (financial and/or administrative) capabilities and intentions of local governments. All of these often different positions, opinions and intentions can be put in a GIS data-

base, which, linked to spatial information, can be used as an analytical tool to find win-win solutions to satisfy demands from different origins. Community maps are not “scientific” maps at all, but contain valuable information on the local situation, which is often overlooked by local governments because of lack of information. The information provided by the communities needs to be “translated” into GIS usable data to enable conflict management, zoning, spatial planning and sustainable community development (see also the contribution by Esquillo-Ignacio and Orban-Ferauge on page 31).

Participatory urban planning is a new, complex and difficult process. Many stakeholders have to be involved. Experiences from many cities in Europe show the difficulties of this process, now embedded in the Local Agenda 21. Communities often organise themselves when they face a common threat or need. As soon as the problem is tackled, the community organisation falls apart (Dowall & Giles 1997). Nevertheless community organisation, capacity-building, and access to finance remain key issues in participation. Participation requires a lot of information and communication, as well as consultations and moderation. There is a need to develop platforms, which should, at least initially, be of an informal nature. GIS can contribute to more participatory approaches in urban planning when used appropriately.

Problems arising with the use of GIS in urban land-use planning

GIS is a tool. The integration of this tool into planning processes requires policy decisions and an infrastructure that allows different stakeholders in the planning process access to the data. This is in most cases not given. Urbanisation is sometimes such a dynamic process that a continuous data update is required. Especially in the peri-urban sector, uncontrolled land-use changes are frequent.

A question that still remains open is how GIS can be made a participatory tool for land-use planning. The traditional way of using GIS is rather centralised, which means that one institution takes the leading part in planning, with little or no participation of other units. GIS does not automatically facilitate the dialogue with the decision-makers but needs to be used in innovative ways.

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