

LAND USE PLANNING

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Summary

Land is finite in extent, whereas more and more people compete for land. In order to avoid that this competition turns into conflicts, firm agreements must be made on how and by whom the available space will be used. Land use planning is a tool to support the orderly occupation and use of land and the avoidance of adverse developments.

Modern land use planning is always focused on one or more specific objectives, and is closely linked to the concepts of efficiency, equity and sustainability. For a land use plan to be successful three conditions must be met: (a) there must be a need for a change; (b) there must be a political will and ability to put the proposed land use plan into effect; and (c) stakeholders must be convinced about the benefits of the plan, and their participation in the plan must be motivated by clear incentives.

A land use plan (and the policy related to it) is based on three major elements: long-term objectives which set the overall target of the plan, strategies for achieving these objectives, and programs and projects for implementing the chosen strategies. Land use plans often provide the basis for a national soil or land policy. This paper describes the objectives of modern land use planning, the elements of planning and the procedures of

the planning process.

The procedure of planning follows a stepwise approach, but as planning without implementation is a waste of time and energy, these steps must regularly be revised and adjusted when necessary. An example is given of a planning approach in ten consecutive steps. The paper concludes with a few examples of planning at different levels: international, national and regional or local planning and land use policies.

1. Introduction

The connotation of land use planning includes three major components: (1) land; (2) the way land is used; and (3) the rational organization of that use in the future.

Land is the basis of our living. It provides food and shelter, filters and stores water, and supplies space for urban and industrial development, leisure and many other social activities. Land is a vital resource and an expression of power and wealth (See: *The Value and Price of Land*). In a predominantly rural society, people who own (productive) land are considered relatively rich and wealthy; landless people are poor, underfed, and often remain dependent on others for their livelihood.

Civilizations have grown and expanded, or have declined as a direct result of their land use potential. The political power of the former USSR was largely based on its immense agricultural production potential. The decline of the Mesopotamian Empire and of the Mayas and other native Indian civilizations in the Andes were due to the silting / salting or the erosion of their croplands.

Land is, however, limited in extent and the amount of cultivable land in particular is finite, while the pressure on it is increasing, both as a result of the growing population (and its needs for more food and space) and of the increasing number of functions of land. Overexploitation and mismanagement of land lead moreover to soil degradation and to a reduction of the finite land reserves. This situation results in a growing competition for land.

In order to avoid that this competition turns into conflicts, firm agreements must be made on how and by whom the available space will be used. This means that land use has to be regulated and that choices have to be made among alternative options. Those choices may depend on both technical and social criteria, or on a combination of both.

Land use planning is a tool to support the orderly occupation and use of land and to avoid adverse developments. It primarily relies on an evaluation of the land potential and on the alternative patterns of its use - including the physical, social and economic conditions which affect that use - for the purpose of selecting the most appropriate use. Its main aim is to select and choose the option(s) which meet(s) best the needs, and to draw up a policy for its sustained use.

Land use planning does not stand on its own, but constitutes an intermediate step between land evaluation and land management. While land evaluation primarily identifies and rates the land potential and recommends alternative use scenarios, land

use planning focuses more on effective choices, with the basic information at hand amongst the options provided by the land evaluation process. The selection of these options is not necessarily determined by rational criteria only, but takes into consideration as well human, economic and environmental aspects. Implementing these scenarios is mainly achieved by land use management techniques. Hence, while land evaluation and land use management operate mainly on technical criteria, land use planning deals with decision making, and this is mainly a political action.

There might be some confusion between land evaluation and land use planning. Land evaluation forms the preparatory step in providing alternative scenarios of use, and makes recommendations in that respect, but takes no decisions. These are made at the land use planning level by decision makers, and these are often not the same people as those who have prepared the land evaluation. In some land evaluation approaches, however - as is the case in the USDA Land Capability Classification and in the Papadakis system of Agro-Climatic Land Evaluation (see: *Agro-Climate-Based Land Evaluation Systems* and *Other Land Evaluation Systems*) - the recommendations are so straightforward that they might give the impression of presenting already the effective planning solution. In reality, as decision making is a political option, it is not uncommon that priority is given to only the second or third best technical solution because it complies better with the social reality of the moment.

2. Need for Land Use Planning

Land use planning finds its origin in the increasing scarcity of land, the competition for that land by a growing number of users, and the risk that this situation might lead to conflicts. It is equally associated with the growing concern for a protection of the environment and a more sustainable use of space. Farmers have been planning the use of their land for thousands of years. The application of scientific principles to the land use planning process is relatively recent.

2.1. Scarcity and Competition for Land

The problem of land scarcity has many reasons. Its primary cause has a physical origin and is related to the limited availability of (productive) land in the world, in combination with the problem of creeping land loss and land degradation. Overall, the total land surface, and in particular the potentially cultivable land, is limited in extent, though this situation may change from one area to another. Part of this land is, moreover, subject to erosion and land degradation (see: *Human-Induced Land Degradation and Soil Conservation*).

Under conditions of tribal land use, as in colonial times in the Americas and Africa, population densities were low, and land was freely available. Every member of the tribe was assured of sufficiently available land to grow crops and to satisfy the food requirements for the family. With more people competing for food and space this initial situation has changed, and most of this formerly free land is now taken into permanent cultivation.

In *Land Use Changes during the Past 300 Years* the adverse effects of deforestation

have been illustrated in different parts of the world. The eastern Mediterranean coast, from Turkey to Lebanon and North Israel, was once densely forested but, as a result of high demands for timber, it has now almost completely been denuded. This was due to the demands either for fuel wood for the local iron smelting furnaces (7th-5th centuries BC), for timber by the Phoenician shipyards (between 5th and 2nd centuries BC), or for the export of wood as building material for the cities in coastal Palestine and Egypt (between 2nd century BC and first century AD). It is noteworthy to state that the only 20 or 21 remaining cedar trees on Mount Lebanon (Figure 1) have now received the status of a national symbol.



Figure 1: The Cedar Forest on Mount Lebanon, a national symbol

Land scarcity has also a social dimension in that the world population continues to grow and that more food has to be produced. Even if part of this increased demand can be covered through improved technology and higher yields, some of it has still to come from an extension of the cultivated area. Over the past 300 years the acreage of cropland has worldwide increased by more than 400 % - most often at the expense of former forests - but still the average land available per head (or the so-called land/man ratio) continues to decline and has already reached a critical level in some Third World countries.

A third reason which creates a relative land scarcity is embedded in the changing perception on land ownership. While land was formerly a public good, it is now largely privatized, and its access is often determined by land tenure regulations. Hence, land which is physically accessible might not necessarily be open to the public because of land tenure restrictions. People in search of land for food production often turn to

squatting or illegal land occupations as a last alternative for survival. The origin of many wars and tribal conflicts goes back to problems over land and water. Present-day problems of land squatting in the Philippines and Brazil have occurred because desperately poor landless farmers look for food and survival. The underlying reasons for many tribal conflicts in Africa - including the genocide in Rwanda - are related to land and land property rights. Problems of land ownership nowadays create still political unrest in Zimbabwe, Namibia and Sudan.

With an increase in living standards and modern lifestyles the function of land has become much more diverse than a few hundred years ago. Land is no more exclusively used for agriculture, but has to meet new demands, in the sense that people's aspirations lead to a greater need for space: for residence, urbanization, industrial and infrastructure development, leisure, etc. The competition between those new uses brings additional conflicts between individuals and interest groups.

Land taken for towns and industry is no longer available for farming; agricultural development into forest areas disrupts the ecological equilibrium in terms of water and wildlife populations. In Java, Indonesia, more than 40,000 ha per year of good rice land is lost because of city expansion. In order to compensate the production loss of this first class land, approximately 3 times more land has to be taken into cultivation elsewhere, obviously in less densely populated and mainly forested areas. The present rate of deforestation in the country is estimated between 9,000 and 12,000 km²/year. Besides a net surface loss of forest land, the irresponsible clearance of forests or improper land management leads to soil degradation and the quality loss of land (UNEP-FAO, 1994).

2.2. International Concern

Since the mid-1980s land problems have received major attention, in particular because the need for meeting the food demands for a growing world population has been linked to concerns about the deterioration of natural resources, and to environmental considerations in general. Hence, land use planning has become closely associated with concepts like rural development, sustainable production and protection of the environment.

In an initial stage this international concern was channeled by the different UN agencies. This is reflected in publications like FAO's *World Soil Charter* in 1981, UNEP's *World Soil Conservation Policy* in 1983, and a series of guidelines for a more sustainable land use in subsequent years. These gave rise to a number of technical and scientific discussion groups and to the organization of international meetings which all emphasized the need for a more coordinated world soils policy and a protection of the environment. This topic is documented in more detail in *Land Use Planning for Sustainable Development*.

The UNCED Conference in Rio de Janeiro (1992) reiterated these needs by focusing on soil inventories and the development of national soils policies. At present, most countries have a National Environmental Action Plan (NEAP), which constitutes an inventory of the country's natural resources and a strategy for future land use management and land zoning. FAO and UNEP have adapted the current approaches and

made them more demand-driven and stakeholder friendly (FAO-UNEP, 1996, 1997 and 1999)

Along the conceptual road to land use planning and sustainable development five milestones can be identified (*See also: Land Use Planning for Sustainable Development*):

- The UN Conference on the Human Environment, known as the Stockholm Conference (1972) where, for the first time, due concern was expressed about the shrinking of the world's natural resources. Hence, the need was formulated for a strong environmental action-oriented approach to sustainable development.
- The publication of the World Conservation Strategy (IUCN, 1980), where governments were urged to use their natural resources for promoting human welfare while respecting the carrying capacity of ecosystems.
- The resolutions and recommendations of the World Commission on Environment and Development (known as the Brundtland Commission), disseminated through its report "Our Common Future" (Anon., 1989), and the important political lobbying on the subject. These findings emphasized that it is the present generation's responsibility to safeguard future generation's options and opportunities for development by protecting the planet's environment and natural resources.
- The United Nations Conference on Environment and Development (UNCED, 1992) known as the Earth Summit of Rio de Janeiro. At this forum the international community formally embraced sustainable development as the standard for measuring development objectives and performance in both North and South. It emphasized the need for both economic development and a respect for the environment. The output of the Rio Conference is immense and includes, amongst others: a set of global conventions on climatic change and biodiversity, a set of principles for governments and people (in the Earth Charter), an action program to promote sustainability (Agenda 21), institutional arrangements to implement programs (the Commission on Sustainable Development), and awareness creation amongst policy makers at the highest level.
- The Millennium Development Declaration and the recent Johannesburg meeting (2002) where a major additional emphasis was given to poverty eradication, aiming to reduce by half the proportion of people suffering from hunger between 1990 and 2015, and to a more efficient use of land, water and other natural resources.

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Biographical Sketch

Willy Verheye is an Emeritus Research Director at the National Science Foundation, Flanders, and a former Professor in the Geography Department, University of Ghent, Belgium. He holds an M.Sc. in Physical Geography (1961), a Ph.D. in soil science (1970) and a Post-Doctoral Degree in soil science and land use planning (1980).

He has been active for more than thirty-five years both in the academic world, as a professor/ research director in soil science, land evaluation, and land use planning, and as a technical and scientific advisor for rural development projects, especially in developing countries. His research has mainly focused on the field characterization of soils and soil potentials, and on the integration of socio-economic and environmental aspects in rural land use planning. He was a technical and scientific advisor in more than 100 development projects for international (UNDP, FAO, World Bank, African and Asian Development Banks, etc.) and national agencies, as well as for development companies and NGOs active in inter-tropical regions.