LAND USE PLANNING FOR SUSTAINABLE DEVELOPMENT

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Contents

Summary

Initially, some notions on sustainable development are dealt with. Since its inception as the new development paradigm there has been a clear shift from a conservation-based ideology to a more development-oriented understanding. Consequently, the parallel development of different perceptions on land use planning is discussed. The 1992 Earth Summit in Rio de Janeiro (1992) and the publication of Agenda 21 constituted a strongly catalyzing event on sustainable development concepts in rural areas, and new perceptions on planning and management of land resources met at cross roads. In this new context sustainable development involved economic, environmental, social and institutional challenges.

The emerging new approaches are streamlined, at least in theory, and provide governments and institutions with a reference base for addressing, in a contemporary context, in how far a better use of basic life supporting systems like land, water and biota can contribute to make the development of rural areas more attractive, sustainable and equitable for all stakeholders.

1. Introduction

A vast majority of households, especially in developing countries, depend on land and other natural resources for satisfying their immediate needs and achieving their long-term livelihood ambitions. Agriculture remains a major activity in most countries except in the industrialized world. Hence, crop production, use and commercialization of forest products, wild food gathering and fishing as well as extensive grazing are substantially contributing to the Gross National Product (GNP) of these countries. At present more than 44% of the economically active people in the world is still employed in agriculture. For Africa this is even more than 57% (against more than 74% in 1965).

In traditional societies the concept of land extends beyond the production purpose but holds also important social and spiritual values. Land is often the only available resource on which rural families can rely to build their lives. Contrary to western mechanisms of land markets, access to land is often regulated through belonging to a social group like a tribe, clan or community. Whereas informal land markets are a reality in rural Africa, its perception differs from the western context, because African land does not only belong to present users but also to the ancestors and the unborn.

If there have been times that land was abundant for rural households, at least in the eyes of the less informed outsider, pressure on land and its impact on agricultural production and the environment pre-occupies almost every government, both in developed and developing countries. At world level the per capita available land has been reduced from 0.39 ha in 1961 to 0.27 ha in the 1990s. The land/man ratio for the African continent has decreased from 0.62 ha in 1965 to merely 0.26 ha in 1995. In countries like Rwanda and Malawi this figure has even dropped to almost 0.15 ha (Verheye, 1997).

One of the consequences of increasing pressure on agricultural lands is the exploitation of marginal land (too steep, too salty, too shallow, too dry) resulting in degradation. Intensification of agricultural production has not yet given the desired results to respond to this decreasing land/man ratio, mainly because most modern techniques and farming systems are not within the reach of the average African farmer. Moreover, agricultural extension services in these countries only target the better-off rural households, because

immediate results are easier to obtain.

The economic reform processes, initiated in the mid-1980s in many developing countries, have aggravated the land access problem. These have contributed in several cases to a considerable increase in GNP for some countries but they have also induced more poverty for the more vulnerable layers of society. In certain countries for example, there is increasing pressure on community lands from commercial entrepreneurs who regard land as a resource base that can easily be acquired at little or no cost. Flawed land legislation and out-of-date tax systems allow large-scale land speculation, depriving ordinary farmers from using these lands and inducing skewed land access. Within this new economic setting, options for alternative land uses such as eco-tourism are becoming important. Big tracts of land are being allocated to new economic agents, but direct benefits for the local populations, who are to be considered as the main historical guardians of these resources, are still scarce.

Political and social conflicts result in mass movements of people, undermining operational systems of land access. This often leads to the creation of "open access" systems, land degradation and uncontrolled natural resource use. National parks, wildlife reserves and biodiversity conservation areas, once the pride of many African governments, are encroached upon by refugees, having no land access elsewhere. Conflict resolution does not automatically and immediately lead to the restoration of these areas. Opportunistic entrepreneurs take advantage of transitional periods of indecisiveness to mine the last remaining natural resources within these reserves.

Being aware of this explosive situation, national governments both from North and South, and national and international institutions including the UN have for many years focused on promoting a more sustainable and equitable land use. They have urged the formulation of land and land use policies aimed at both conserving land resources and optimizing their production in its largest context. This chapter deals with past and present thinking on land resource management in the context of sustainable development.

2. The Concept of Sustainable Development

Over the past two decades sustainable development has been a major topic on the political agenda of governments and international organizations. The significance and approaches to sustainable development have been extensively discussed in international literature (Pearce, 1989; Morita, 1993; Reed, 1996; Murcott, 1997). In this discussion five major milestones can be identified along the conceptual road to sustainable development.

2.1. Milestones on Conceptual Thinking

The UN Conference on the Human Environment, commonly known as the **Stockholm Conference (1972)** was one of the first initiatives of the industrialized countries to address concern about the rapidly shrinking world's resource base, both qualitatively and quantitatively, either through pollution in the developed world or population explosion in the developing countries. A number of catastrophic events (Bhopal, Seveso, Chernobyl, Amoco Cadiz) had already highlighted the risks of an excessive and uncontrolled industrialization. Pressure of civil groups and not directly conviction of policy makers had put this environmental concern on the political agenda. At the same time, structural

problems of the Third World were only addressed in an emergency relief context.

Third World policy makers regarded poverty alleviation as the single most important issue to arrest environmental degradation. They highlighted the relation between impoverishment and the degradation of natural resources through processes like soil erosion, deforestation and desertification. Economic growth was put forward as the only viable answer to this problem. The growth model through industrialization, as was the case on the European continent from the mid 1800s until the beginning of the 1960s, was severely discouraged for different reasons. Alternatives like an accelerated development of the agricultural sector had put severe stress on the use of rural land.

The Stockholm Conference resulted in a strong environmental action-oriented approach to sustainable development, with the needs of the third world capturing much less attention.

The second milestone was the publication of the **World Conservation Strategy** (IUCN, 1980) at the initiative of IUCN, FAO, UNEP and UNESCO. It promoted development objectives through the sustainable utilization of species and ecosystems, while maintaining essential ecological processes and life support systems, including the preservation of genetic diversity. Its point of departure was that development must be compatible with conservation. This strategy provided guidelines for governments to use their natural resource base for promoting human welfare while respecting the carrying capacity of ecosystems. The follow-up publication "Caring for the Earth" in 1991 (IUCN/UNEP/WWF, 1991) reiterates that sustainable development should aim at improving the quality of human life within the carrying capacity of supporting ecosystems.

The third milestone refers to the work of the **World Commission on Environment and Development**, known as the Brundtland Commission. Its report "Our Common Future" (World Commission on Environment and Development, 1987) 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. It considers the alleviation of poverty and deprivation in developing countries as a priority to achieve sustainability. Conservation and enhancement of the resource base are *conditions sine qua non* for poverty alleviation. The concept of development needs to be broadened so that it does not only cover economic growth but also social and cultural development.

The **Earth Summit or United Nations Conference on Environment and Development** (UNCED**,** 1992) constituted the fourth milestone. 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 reflected the southern perspective in emphasizing that basic development is part of a framework that includes environmental issues. The social dimension of sustainable development was initially only vaguely touched, but was later addressed in the wordings of additional UN initiatives: Summit on Human Rights, Vienna 1994; Social Summit, Copenhagen 1995; Women Summit, Beijing 1995.

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 (the Earth Charter), an action program to promote sustainability (Agenda 21), institutional arrangements to implement programs (the Commission on Sustainable Development—CSD), and awareness raising amongst policy makers at the highest level.

The importance of the use of land and other natural resources in the economy of rural populations is recognized. With a continuing degrading land resource base that is clearly finite, its allocation and use must aim at satisfying the needs in the most equitable and sustainable way. Chapter 10 of Agenda 21 considers that an integrated approach to the planning and management of land resources—more popularly called land use planning—is essential for achieving this.

The most recent development in this thinking was achieved at the **Johannesburg meeting in 2002.** At this fifth milestone a major additional emphasis was given to poverty eradication and the more efficient use of land, including a better integration of women, on the basis of equality with men, and indigenous communities in decision making and implementation of agricultural activities and a more efficient use of natural resources.

In particular with respect to Africa it was indicated that most countries on the continent have not benefited enough from the opportunities of globalization. Africa's efforts to achieve sustainable development have been hindered by political instability and ethnic conflicts, leading to the loss of goods and harvests, insufficient investment and the impossibility to stop the negative effects of HIV/AIDS. Major hopes are now established on more concrete actions for the implementation of Agenda 21 in Africa through the New Partnership for Africa's Development (NEPAD) which commits African leaders to the people of Africa and to a more active South-South co-operation.

2.2. Additional Considerations

Whereas initially the sustainable development concept finds its roots in the protection and safeguarding of the environment, a growing emphasis is nowadays put on economic development. A good indicator for this shift is the re-thinking of African Range Management Policies under the auspices of the Commonwealth Secretariat, the Overseas Development Institute (ODI) and the International Institute for Environment and Development (IIED), dating back to the early 1990s and disseminated through the Woburn conference (Behnke and Scoones, 1991). In particular the critical assessment of the concept of carrying capacity is interesting in this context, not least because it is central in the IUCN, UNEP and UNESCO approach to sustainable development.

Carrying capacity is traditionally assessed by using standard botanical indicators like perennial/annual ratios, bush encroachment, increasing and decreasing species. A undesirable change in these indicators (for instance through grazing) is considered as being a sign of overstocking and environmental degradation. African pastoralists, however, are able to profitably maintain higher stocking rates than commercial beef ranchers without irreversibly degrading the environment by adapting different

management strategies. These are mainly based upon opportunistic responses to spatial and temporal variations of the resource base. This approach defines carrying capacity relative to economic objectives and management practices and not only to biological factors. The above also implies that sustainability should not be based on the assumption that ecosystems are stable or at equilibrium and that maintaining an assumed stability automatically results in sustainability. Altogether it challenges the idea that sustainable development should happen within limits of carrying capacity.

Another area of concern is that sustainability is often assessed in a global framework, without considering enough its impact on the day-to-day land user. It is questionable whether national development achievements like the five year consecutive 10% economic growth of Mozambique effectively has contributed to, for instance, household level poverty alleviation in rural areas. This leads automatically to the conclusion that social issues are not yet adequately dealt with in sustainable development concepts.

A refreshing approach which is people-centered and that offers possibilities for addressing directly the local land user, is the "Sustainable Livelihoods Strategy" promoted by the Department for International Development (DfID). While its major objective still has a global character, i.e. reducing by one-half the proportion of people living in extreme poverty by 2015, it has a strong focus on the micro or community level. People rather than the resources they use or the governments that serve them are the priority concern. It is the underlying motivation of supporting people's livelihoods that should determine the shape of the support (DfID, 1999).

Often the major livelihood strategies of rural people are not maximization of production or profits, but minimization of risks for the provision of a continuous, steady and assured income. This may imply that sustainable development is not necessarily equivalent to economic growth. Reed (1996) strongly emphasizes that a major weakness of most thinking that has shaped the concept of "sustainable development" wrongly assumes a continuous growth that is supported by unlimited technical innovations and technological breakthroughs. We would like to add that even when these innovations exist, they are not always within the reach of a majority of land users.

2.3. Sustainable Development in a Land Use Management Context

From the above it becomes clear that it is generally accepted that sustainable development considers three dimensions that are closely inter-linked and between which trade-offs are inevitable: environmental, economic and social. Moreover, these three can hardly be implemented if not supported by institutional and political backing.

The **environmental dimension** generally deals with maintaining a certain stock of natural resources above a certain quality threshold. A number of criteria to asses this dimension can be put forward. These include:

- Biodiversity preservation measured against species richness, abundance, diversity, high number of endemic species, high number of important gene pools.
- Rate of irreversible resource depletion.

- Degree and reversibility of degradation of renewable resources.
- Use rate of non-renewable resources against the potential use by future generations and/or the orderly transition to renewable energy sources.
- Reduction of adverse global impacts.

The **economic dimension** can be assessed as follows:

- Steady, continuous stream of income at different levels: individual households, communities, countries.
- Increased food availability, real income and cash.
- Maintenance of productivity in the face of stress or shocks like human health, natural disasters, economic conjuncture, social conflicts.
- Real benefits derived from land management.
- Efficiency of investment through cost/benefit analysis.
- Maintenance of a given level of expenditure over time.

While to date the **social dimension** has been less addressed in the sustainable development discussion, it embraces a wide range of issues that should be considered if sustainable development aims at being socially acceptable:

- Equitable access to resources.
- Equitable access to information and services.
- Protection of acquired rights.
- Redistribution of wealth derived from land use and management.
- Active participation of all stakeholders in policy and law development.
- Governmental and local accountability for resource use and good management.
- Respect for and valuing indigenous knowledge, local diversity and rural populations' livelihood strategies.
- Room for social and cultural evolution without abrupt disruption.
- Fulfilling people's cultural and spiritual needs.

Trade-offs between the different dimensions of sustainable development can only be made when there is an appropriate institutional capacity to negotiate and implement the different options. This **institutional dimension** is often neglected or assumed to be in place. It includes formal and informal institutions that affect the use and the transfer of assets to future generations to assure the quality of life in the long run. It can be observed that in many African countries the capacity of institutions is wholly incompatible with their mandates to promote sustainable development. New institutions are created as a response to external factors, but are not perceived by governments and politicians as being really instrumental (like several Ministries of Environment created after the Rio Conference). When institutions are not empowered to execute their role or when they do not have the capacity to continue to perform their functions over the long term without being dependent upon external support, it is highly questionable that sustainable development can be achieved.

Finally, it should be recalled that sustainable development approaches may only be put into practice if there is a **political will** to do so. The promotion of sustainable

development implies a redistribution of political and, consequently, economic power. Empowerment of ordinary land users, participation of civil society in policy and law development, sharing of resources, and redistribution of wealth are all issues that may reduce control of elite groups, and as such may be politically sensitive issues.

3. Traditional Land Use Planning

3.1. Land Capability and Land Evaluation

Identifying and comparing present and potential land uses for different land types, making decisions on land uses types and implementing development programs and activities on the basis of these decisions is an activity that is being implemented by governments, communities and individuals to organize space. Sometimes it is rigid and formal like in urban and industrial planning with hard copy plans passed from top to bottom through a wide number of different administrations. Elsewhere, it is flexible and more informal when considering, for instance, annually re-negotiated trekking routes between different nomadic tribes. These land use plans are orally agreed upon but are supported by very precise though fictitious drawings.

A major breakthrough in land use planning methodology for rural areas dates back to the 1960s with the introduction of the land capability concept (Klingebiel and Montgomery, 1961). This approach was developed to identify and classify areas to be allocated for different agrarian activities like irrigation, mechanized farming, grazing and forestry. This initial work was followed in the late 1960s and early 1970s by an attempt to add value to the results of soil surveys in order to determine land use potentials and to promote land use patterns according to land potential. This has led to the Framework for Land Evaluation (FAO, 1976), which provides a solid and unique technical basis to compare the present and potential performance of different land uses on different lands. More details on these aspects are discussed *in extenso* in *The FAO Guidelines for Land Evaluation* and in *Other Land Evaluation Systems.*

Over the years, a series of guidelines have been produced dealing with land evaluation for different land uses such as rain-fed agriculture, irrigated agriculture, grazing, and forestry (FAO, 1983, 1984, 1985, 1991). The comparison of the suitability of these different land uses for specific, mostly bio-physical conditions, identifying the most suitable land use between the alternatives and allocating land according to this optimization process was generally considered as land use planning (FAO, 1993).

3.2. Socio-political Setting at the Time of Methodology Development

In order to fully comprehend the logic of the above approach, it is important to consider the general socio-political setting (with an emphasis on the African continent, being a priority region for testing the approach) under which it was developed. In this respect the following points are relevant:

- A majority of countries adhered to a centralized decision-making model, including centralized planning according to multi-year development plans.

- The state considered itself as the major player for food production. This often entailed a marginalization of the small farmer versus the big state-run agricultural enterprises. The rationale for land use as implemented by the peasant and based on inventive strategies of risk avoidance, diversification of production and opportunistic use of key resources was associated with "non-productive subsistence tactics". Western production models like mono-cropping and cattle ranching for beef production were examples to promote and to substitute indigenous land use systems.
- Major land use planning exercises occurred at national and regional scales with clear differences in biophysical conditions. Social conditions were not often included because the human capital was considered as merely an input into the system, i.e. a production factor. At the local level, land use planning relied heavily on mathematical models to determine for instance human carrying capacity in settlement planning which consequently was imposed on people, often with coercive measures. This approach was at the basis of the development paradigm of *ujama* in Tanzania, and communal villages in Mozambique and Angola for example.
- Agricultural policies were directed towards food self sufficiency, hence stressing the importance of crop production over other uses. The use of “green revolution” technical solutions for increasing production was promoted, and research was adapted to these objectives.

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Biographical Sketches

Paul De Wit is an agronomist and soil scientist by formation. He has been working since 1979 mainly for FAO in forestry, land resources assessment, land tenure and rural development, especially in an African context. Since the mid 1990s, he has been active in land policy and legislation development with a special emphasis on rights-based approaches for rural communities and vulnerable people. Through his fieldwork and wide expertise, he has substantially contributed to the development of new land use planning approaches that emerged since the Rio conference in 1992. Other fields of experience include land administration and registration, land reform in eastern European countries, conflict management and community based natural resources management.

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.