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Sustainable Development Between Politics and Policies

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CHAPTER SEVEN

SUSTAINABLE DEVELOPMENT BETWEEN POLITICS AND POLICIES *

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Introduction

Perhaps no other term or "buzzword" has received publicity in international and national development circles in the last decade like "Sustainable Development." The breadth and vagueness of the term itself make it politically appealing, but confusing as a point of reference for any concrete operational activity. In fact, when the term was passed from scientists to politicians, it became a slogan and its definition was stretched and distorted.

It is true that the issues associated with sustainable development are extremely complex. Yet they have to be dealt with, given the increasing evidence of serious negative consequences of non-sustained development. Evidence from the Sahel, the Andes, the Amazon, the Himalayas, the Middle East and North Africa and many other regions of the world indicate the misery and suffering which can result from the lag period between the political decision to prepare a sustainable development strategy and securing political and financial commitments to implement it. While in many cases intentions may have been good, results were poor.

Policy-makers can act to avoid some of the same mistakes in the future. To do so they need to understand clearly the implications of alternative development policies, strategies and activities. More information-supported choices provided by scientists can lead to better strategies for sustainable development.

Definitions and Concepts

The Brundtland Commission defined sustainable development as *the path of human progress which meets the needs and aspirations of the present generations without compromising the ability of future generations to meet their needs.*

This definition, though accepted by the world community at large, still indicates that sustainable development is a broad term that is difficult to define precisely. It is used differently by different people, depending on their backgrounds, purposes and viewpoints (Brown et al. 1987). However, in all cases, the term seems to embrace the concept of "**production** with

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environmental **protection**" rather than environmental protection alone. This is why, in contrast to many other terms and concepts used in the past by environmentalists, sustainable development has been embraced as an important concept by the development community at large. "Production with protection" is also how we should interpret the term.

For simplicity and practicality, Gregerson and Lundgren (1990) defined sustainable development as *development involving changes in the production and/or distribution of desired goods and services which result, for a given target population, in an increase in welfare that can be sustained over time, with minimal environmental degradation.*

According to the same authors, this definition focuses on those increases in "desired goods and services" that lead to increases in "welfare." But welfare is a very complex concept which really is not specifiable in quantitative terms. Welfare relates to level and distribution of income, physical and mental health, food, education, housing, clothing, recreational opportunities, and many other factors. In practical terms, it is defined by each society through its laws and cultural traditions.

It is also important to specify adequately what "target population" means in the definition. In the ideal case, the whole world population should be the target. Thus, the welfare of at least some people would be increased on a sustainable basis without adversely affecting the welfare of other people. In the more realistic case, given political and economic realities of the world, the target population becomes a more limited group, say the national population of a country, or the population of given project region.

In the broad interpretation of sustainable development, the focus should be on sustaining an increased level of welfare rather than merely sustaining (protecting) the resources base on which welfare partly depends. Resource sustainability is only one concern. Ultimately, the concern is with the welfare-sustaining capacity of a development system. Accepting this welfare-sustaining interpretation in agriculture, for example, means that the focus is not on "sustained yield farm development," but rather on "agriculture for sustainable development," or crop growing, management and use strategies to increase human welfare on a sustainable basis.

Given the broad concept of sustaining welfare, it follows that depletion of a specific natural resources asset, i.e., non-sustainability in terms of the supply of that resource, can still be part of a broader welfare sustaining development process. It all depends on where, when, and how the depletion occurs and what replaces that depleted resource. An example would be a progressive conversion of desert land resource to provide land for sustainable agriculture, or to provide the capital (or space) for other development, such as in the case of new cities. In terms of the last definition, this depletion of desert capital would be part of a welfare-sustaining development. In other cases (depending on location and agroclimatic conditions) clearing and converting of farm land leads to creation of desert and barren lands and a reduction in welfare, i.e., this (conversion) activity contributes to non-sustainable development.

Thus, the same **type** of activity--desert agriculture in the above case--may or may not contribute to the welfare-sustaining ability of a development system. Given resource availability, technology, institutions and desired output (the components of development activity) sustainability depends on specific surrounding conditions (location), on scale (extent, intensity, duration), and on timing of the activity in relation to other activities. We need to analyze the role of each of these dimensions before passing judgment on the contribution of a given development activity to the sustainability of a development system and resulting increases in welfare. The **context** of development does make a difference in assessing the contribution of an activity to sustainable development.

Policies for Resource - Sustainable Models

In general, the implicit assumption and the political commitment underlying the resource-sustaining model are that sustaining a resource is good and depleting it is bad. This view of the world is unfortunately not always appropriate, as discussed and illustrated earlier. We therefore, need to consider other dimensions. The institutional and environmental contexts within which changes in the resource base take place (i.e. policy aspects) also should be considered in reaching any conclusions concerning the desirability of a given physical/biological change and its contribution to development.

The water issue in Egypt is a good example to illustrate such contexts. It is a natural resource that is capturing the attention of politicians and the general public alike locally, regionally and internationally.

Sustainable management of water resources is influenced by the facts that:

1) People are impacted positively and negatively by the interaction of water with other resources; and in turn, people affect the nature and severity of such interactions by the ways in which they use resources, the quantities that they use and the quality they can tolerate.

2) The impacts of these interactions do not follow political boundaries, as water flows towards the Mediterranean regardless of how people define their political boundaries. Thus, on the regional level what is done in the highlands of Ethiopia and/or in Central Africa for example can have significant effects in Egypt, and on the country level the ways in which upstream farmers and industry use or mis-use land and water, (e.g. industrial pollution) will affect people downstream.

3) Since such interactions cut across political boundaries, what may be sound resource use from the point of view of one political unit (country, community, or landowner) may not be sound resource use from a broader, societal point of view, because of undesirable downstream effects, i.e. what economists call "externalities."

4) Given the existence of externalities, ecologically sound management becomes good economics for all concerned only if costs and benefits are appropriately distributed among the political units, communities and

individuals that carry out the water management activities and those who benefit from them. In other words, equity becomes an integral component of sustainability.

National Development Programs have focused so far mainly on those factors that specifically are identified with sustainability issues at the project level; water resource management for example. It is at the project level that the physical actions which contribute to non-sustainability of a development system can be controlled most directly. However, we recognize fully that many of the major sustainability issues facing Egypt will not be resolved merely by working with development projects, despite their political appeal. Fundamental policy changes also are needed to encourage people to think about sustainability issues as they go about their everyday activities quite outside a project context. Development projects and the programs into which they are organized are only a small part of the total human activity affecting the sustainability of development. They only can demonstrate what types of activities lead towards sustainable development. To make such demonstration effective in terms of widespread diffusion and adoption, appropriate policy environments have to be established, which may, or may not, conflict with political stands or affiliation.

An Example for Sustainable Development Policies and Their Implementation

Since its initiation in 1979, the Desert Development Center has adopted a new concept for sustainable desert development in Egypt aiming at a) achieving optimal productivity with minimal tampering with natural desert ecosystems and b) exploiting local renewable energy resources. A "systems approach" to desert farming was devised and implemented within the general context of "Desert Development Systems". It is defined as the complex grouping of soil, water, crops, livestock, labor and other resource and characteristics within an environmental setting that the farming family manages in accordance with its preferences, capabilities and available technology.

While conventional farming systems research and development are dealt with in terms of objectives, resources, constraints and interactions, it was realized upon implementing desert farming systems that the available resources (inputs) are in fact the constraints. These were: a) inhospitable natural environment that include harsh climate, poor soils, limited irrigation water and expensive energy resources; and b) a modest stage of development of local and potential farming population.

The strategy of research for sustainable development was designed to deal with all components in an integrated manner and to avoid environmental degradation. That is what made DDC's policy different from desert agriculture traditionally practiced in Egypt. For example, it is customary to transport silt from the Nile Delta and Valley to the desert land in order to improve physical and chemical characteristic of its sandy soils, thus obtaining high yields as early as possible. The consequence is

depriving old land of vital fertile soil without helping the new land much because the silt will soon disperse within the larger sand particles upon irrigation. Another inappropriate practice is the transport of farmyard manure from the old land to the new land, with the consequent infestation of virgin soil with pests and weed seeds. Still a third malpractice is flood irrigation of the sandy soils which resulted in many cases in secondary salinization and water logging in additions to the unwise consumption of limited water resources. All such practices would lead to resource degradation, thus non-sustainability.

The program of sustainable desert agriculture at DDC was conceived and constructed within a large desert research and development scheme, (El-Lakany 1991a). Its elements included:

a) **Protective tree planting.** The first step of viable desert farming, after acquiring land and securing water, is the protection of fields and settlements against harsh desert climate. It has been proved beyond doubt, that shelterbelts and windbreaks are essential prerequisites for successful desert farming provided that appropriate species and designs are used. Tree and shrub species specially selected for integration in desert farming systems have been grown as windbreaks and their favorable physical and biological effects were realized as early as the third year after establishment. Growing of multipurpose, nitrogen-fixing species (**e.g.** ***Casuarina*** and ***acadia)*** as windbreaks is favored, (El-Lakany, 1991b).

b) **Improving of the productivity of sandy soils.** Naturally, sandy soils are very poor in nutrient elements and organic matter. In order to build up soil productivity on a sustainable basis, alternative, but mostly complimentary approaches were implemented. Well known techniques for improving soil chemical and physical characteristics were applied in the early stages of farming. Growing perennial leguminous crops such as alfalfa and annuals such as cowpeas, peanuts, lupins .... etc. proved to be useful for building up the soil. Such practice takes longer time (4-5 years), but more compatible environmentally compared to conventional methods in which Nile silt is spread over the sandy soil. Periodic monitoring of soil chemical and physical properties from time zero, i.e. initiation of the farm, showed remarkable build up of soil macro- and micro-nutrients as well as improved soil physical properties (e.g. higher water holding capacity and lower permeability) as time elapses.

c) **Appropriate crop varieties and crop rotations.** Sustaining soil productivity was achieved by growing certain crops and adopting specific rotations. Out of several crop rotations tested, it has been demonstrated that growing alfalfa for 3-4 years followed by two seasons of cereals is a good practice. Equally successful is the alternation between legumes (e.g. peanuts,, peas, faba beans, lupins and cowpeas) and cereals (e.g. barley, fodder sorghum, canary grass, wheat) in a three year rotation.

High yielding crop varieties which are developed for fertile soils require high inputs of irrigation, chemical fertilizers and pesticides. They were found to be sensitive to stress conditions prevailing in the desert, thus unsuitable for sustainable desert farming systems. On the other hand, drought-tolerant varieties developed for rain-fed extensive agriculture in arid and semi-arid regions, may not be the best suited for irrigated desert agriculture,, considering costs of irrigation water and other elements of cropping.

d) Water management. Since water is the most expensive input in desert agriculture, sound water management techniques are vital for sustainable farming systems. Growing of low-water requiring crops coupled with employing water-saving irrigation systems (e.g. sprinkler and especially drip), proved to be very successful. However, under desert conditions where crop yield is almost a function of the amount of irrigation water received there should be a "tradeoff" between water used and yield desired.

e) Organic and Chemical Fertilizers. Many advocates of sustainable agriculture tend to almost prohibit the use of chemical fertilizers on the farm. While the negative, and sometimes detrimental ecological effects of chemical fertilizers are well documented in many parts of the world, it is almost impossible to produce adequate crop yields on sandy soils without the addition of chemical fertilizers. Certain macro- and micro-nutrients are always needed in forms and quantities that vary from one crop to another. Long-term fertilizer experiments at DDC have indicated that application of chemical fertilizers, in terms of type, quantity and timing, should be based on plant and soil analyses, which may differ according to location, crop, crop rotation .... etc. Production function analyses indicated that crop yields depend on the amount of chemical fertilizers applied. Addition of chemical fertilizers will increase yield at an increasing rate up to a certain point where the yield starts to increase at a decreasing rate. At this point additional yield may be sacrificed in favor of sustainable production and better environmental quality. This can be looked upon as a point on a production-possibility curve where on one axis we have environmental quality and on the other the production of material goods. In other words, for sustainability to be realized at an optimum, rather than a maximum, certain quantities of fertilizers must be applied. In this respect, it is worth noting that the steady increase in the prices of fertilizers is also conducive to rationalizing their use.

Other approaches to reducing reliance on chemical fertilizers are to be found in the growing of nitrogen-fixing crops and using yard manure produced on the farm. It is well known that animal manure, in addition to its nutritive value to plants, improves physical properties of the sandy soil. DDC has implemented systems using manure first to generate biogas, as a renewable energy source for household use, while the liquid and solid residues are used as manure.

f) Livestock Production. Livestock proved to be an integral component of sustainable desert farming systems. In addition to economic returns from meat and milk production, major contribution to desert agriculture would be manure. At DDC, certain desert-tolerant varieties of cattle and sheep are raised. Brown Swiss X local hybrid cows and Barqi (desert) sheep, which are not among the highest yielding varieties in the world, proved to be very economic under the feeding system applied at DDC. Under this system cattle followed by sheep graze alfalfa and other fodder crops, with minimal supplements of minerals and vitamins, hay or straw from external sources. Results of gain in body weight, milk production and breeding characteristics were found to be economically comparable to, if not better than, those obtained in the Nile Delta. The major lesson from the DDC experience to-date in sustainable desert farming - is the usefulness of crop-livestock linkages.

A complementary agrosylvipastural system was successfully implemented on the same farm (El-Lakany and Mahmoud, 1989). In this system, *Acacia saligna* is grown as windbreaks around pasture plots and/or as clumps within the fields to be used as supplementary fodder for cattle and sheep. The shrubs are either grazed directly or pollarded every 6-12 months on 6-8 years rotation. The fodder value of acacia effectively compliments alfalfa and other traditional fodders.

g) Pest Management. Introduction of agriculture into the desert ecosystems imposes new conditions, most obvious of which is the activation of dormant pests and introduction of new ones. As a result of desert farming, several species of fungal, bacterial and viral diseases, insects and weeds were detected in the fields. In certain cases the infestation was epidemic which necessitated the use of specific pesticides and herbicides. At DDC, biological control of certain pests is practiced within integrated pest management schemes. Other measures of pest and weed avoidance and control include use of resistant species, crop rotation and manual weeding. Control begins by surveying the pests and weeds infesting the fields, then prescribing appropriate treatment(s). Indiscriminate spraying of chemicals which has wide spectrum of action is avoided as much as possible. Economic/biological balance between the use of chemicals and yield is sought so that some yield is sacrificed in favor of reducing the use of chemicals thus achieving sustainability.

h) Socio-Economic Evaluation. The data collected from the long-term experiments are analyzed in terms of biological developments (e.g. crops yield, soil productivity, animal performance .... etc.), actual resource requirements, economic and financial feasibility and social acceptance. Results are made available to government agencies and farmers. In spite of the relatively short time (12-14 years) which does not allow conclusive recommendations, preliminary analyses attest to the economic viability of the farming systems being tried. These experiments enjoy the unique

characteristics of keeping biological, technical, fiscal and sociological records from the starting point. Micro-economic investigations are expected to yield good guidelines for policy makers and farmers alike.

i) **Information Dissemination.** Ultimately, the overall impact of the approach to sustainable desert farming would be its acceptance by the desert farming communities. Further to information dissemination through seminars, field days, training courses and workshops, a specific type of on-farm research and demonstration has been conducted by DDC's interdisciplinary team. This work began by surveying the desert faring communities in the vicinity of the Center, then selecting target farmers to represent the farming population, production patterns and farming practices. That was followed by identification and evaluation of the existing farming systems and problems facing the farmers. The research and demonstration plans were drawn accordingly, with due consideration to the farmer's working and living conditions. All research and demonstration trials have been undertaken with full participation of the farmer's household.

Preliminary surveys revealed the fact that most small desert farmers, although they came originally from the Nile Delta and Valley where intensive farming patterns prevail, practice some forms of subsistence agriculture. Based on the experiences gained at DDC, modifications of the system were carried out through introduction of new crops and crop rotations, as well as water management, livestock management and integrated pest management and weed control. The research team was unable to deal with certain other problems encountered by the farmers such as land tenure, rural credit and marketing.

The results of the On-Farm Research and Demonstration Program were remarkable as far as crop yields, acceptability and adoption by the farmers are concerned. Some of the participant farmers moved from the state of subsistence farming to a small enterprise type. It is gratifying to see so many other farmers adopting the innovations and techniques demonstrated on the lands of their neighbors, especially as the age-old, ingrained habits of the Nile Valley practices were once perceived impossible to change.

Conclusion

The concept of sustainable development is an elusive one. It has great political and philosophical appeal, and it is useful as a concept on which to base debates on the fundamental directions in which society should be going with development programs. However, it provides little guidance in developing concrete programs and projects. We do not and cannot know the future. Thus, we cannot know now whether a given development is sustainable or not. What this implies is that we should focus on what can be done to avoid potentially non-sustainable developments, since this is something which can be dealt with in a very concrete, operational way in the present.

Gregersen and Lundgren (1990) argue that we need to develop an understanding in a generic sense of the factors that are associated with non-sustainable development and the contexts within which such factors are important and the conditions under which changes in such factors may serve as early warning signs or indicators of potential non-sustainability problems. This involves defining the general nature of impacts expected from given activities under given circumstances and then exploring the dimensions of the likely impacts.

National planning for sustainable development should be seen as flexible in substance, responding to changing needs, and in format. Thus the harmonization of various plans is not necessarily intended to result in one document, but rather to aim towards compatibility among the different strategies to reach sectoral, cross-cutting and macro-economic objectives. Various mechanisms are being created to work towards this compatibility which requires concerted efforts and political will among major stakeholders in the public and private sectors. A recent workshop organized by the Organization for Economic Cooperation and Development (OECD, 1993) has identified the following elements *inter alia* for national sustainable development plans:

- Major stakeholders in the society must participate both in the design and the implementation of the plan.
- Determination and perseverance of officials as well as the commitment and leadership of politicians are essential for success.
- Information must be transparent, in particular that on progress achieved.
- The culture and value systems in the individual country must be taken into account in order to understand what sustainable development would mean. With this in view local knowledge must be utilized as far as possible.

The example illustrated here for the DDC program for desert agriculture proves the validity of the above noted elements.

Projects, in the traditional sense of the term, are obviously not designed to be sustainable forever. Thus, looking at sustainability of projects themselves beyond their intended lives makes little sense i.e. politics should not dominate such projects. Rather, the concern should be with the sustainability or non-sustainability of the benefits flowing from projects, which in most cases relate directly or indirectly to increased level of welfare of the project beneficiaries or be apart of policies for development. In all cases we must restrain individuals, politicians included, who try to sustain themselves by talking about sustainable development, but doing nothing to achieve it.

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