

# Abstract Volume 3 (1992/93): Energy and Sustainable Development

## Global Energy Policy in Transition

The availability of energy has ever since been an essential factor of economic and societal development. In the many domains of private, public, and economic life energy substituted for human labour or complemented it, and thereby it brought about enormous productivity gains. The oil crises of the seventies revealed the immense and global significance of a secured and reliable energy supply. During these years the short supply of oil hindered economic activities in oil-importing countries and induced severe deterioration of the trade balances. In many developing countries these oil price increases were the major reasons for the ensuing indebtedness. Due to these impacts of the oil crises, the major objective of national energy policies in the seventies was to attain a better secured and independent energy supply. On the whole, this decade was characterized by a general anxiety about the exhaustion of natural resources. Undoubtedly, the report of the Club of Rome with its frightening future forecasts did its share to stimulate such a general attitude.

Since the late eighties a new problem emerged with regard to national energy policies. The incidence of global warming as a repercussion of the burning of fossil fuels disclosed a new kind of scarcity with a biophysical character. As a consequence of this new kind of scarcity the use of fossil fuels as a source of energy will have to be reduced in the long run. Thus, the biophysical limits of the Earth proved to be the more restrictive scarcity in the use of energy.

Since the publication of the so-called Brundtland-Report in 1987 and the UN-Conference on Environment and Development (UNCED) in 1992 there has been an apparent change in the paradigm of development policy. The new concept of "Sustainable Development" that makes allowance for both economic and biophysical issues and scarcities became to be acknowledged on a global scale. The general implications of this concept that postulates the satisfaction of present and future basic needs are unequivocal indeed: the energetic use of fossil fuels is to be reduced successively in the long run in order to diminish the degradation of the atmosphere. If future developing paths are to be sustainable, new environmentally sound energy sources have to be found as substitutes and a global energy transition has to take place. The authors of the third volume of the *African Development Perspectives Yearbook* analyze the involvement and the role of the sub-Saharan African (SSA) countries within this global context of energy policy.

## The Double Energy Crisis in Sub-Saharan Africa

Undoubtedly, the industrialized countries are responsible for the major part of greenhouse gas emissions, whereas the share of all SSA countries in global carbon emissions just amounts to three percent p.a.. However, this does not mean that energy provision in sub-Saharan Africa is sustainable on economic and biophysical grounds, nor does it implicate that the continent is without significance with regard to the greenhouse effect. On the contrary, the SSA countries are struggling with a double energy crisis since the early 1970s.

The commercial sector's dependency on imported oil was a major reason for the fact that many African countries were hit hard by the oil price increases in the 1970s. National indebtedness rose throughout SSA due to increased import bills and the balances of trade deteriorated to such an extent that even the declining oil prices in the early 1980s did not bring significant relief. However, the rural people who constitute as much as seventy per cent of the whole population in SSA countries were not affected that hard by this crisis due to the dual structure of energy provision. Contrary to the commercial sector with its dependency on fossil fuels, the dominant rural energy resources are traditional firewood, charcoal, dung, and agricultural residues. This structure of energy supply in many SSA countries is partly due to the priorities of national energy ministries who promoted fossil fuel energy generation in order to encourage the national industrialization process. Since large industries and the energy supplying utilities are located near large cities the national governments focused their efforts on those areas and abstained from extending the electricity infrastructure to rural regions.

However this may be, the rural supply with traditional energy resources is not secure either. The huge demand for firewood and charcoal drove the people to clear their nearby forests of timber. This unsustainable use of regional natural resources resulted in degraded vegetation and desertification and increased the efforts of labor and time to obtain the energy resources needed. Furthermore, population pressure led many peasants to burn down rain forest areas in order to release some agricultural land. Since the fertility of these soils is declining very

fast due to heavy erosion, the burning down of tropical forests is a continuous process in sub-Saharan Africa. The environmental consequences are tremendous: every year an area of 3.7 million hectare of the African tropical rain forests is irretrievably lost and the clearing rate is thirty times higher than the rate of reforestation. In many cases the overuse of arable soils impedes regeneration processes of the rural vegetation and thus soil erosion, desertification, and salinization continue and thereby threaten the natural livelihood conditions of the people. Thus, the supply of rural areas with energy resources is becoming critical and it contributes to the degradation of ecological systems. The consequences for rural people are manifest as well: fertile soils decay and deserts are spreading. The incidence of drought has been increased in recent years, regional climate change made itself felt, and people were compelled to migrate due to environmental reasons. After all, the destruction of the tropical rain forests contributes to global climate change. Thus, energy provision in SSA is not sustainable at all, it is earmarked by economic and ecological crises.

### **National Energy Policy, the Significance of International Energy Cooperation, and Rural Energy Supply Options**

The specific constellation of energy provision on the African continent is the point of departure of the third volume of the *African Development Perspectives Yearbook* on "Energy and Sustainable Development". The editors tackle with the issue by focusing on three major questions:

- Which promising national energy policy options do exist for African countries in the presence of the double energy crisis ?
- How important is the role of international energy cooperation in coping with the energy problems of the region ?
- Which options and alternatives do exist for rural areas to secure a sustainable energy provision ?

The editors of the *Yearbook* give high priority to national energy policy, because it is deemed the only means to create a coherent national strategy to encounter the complex energy problems. Due to the experiences with development policy of the past that revealed the behavior of donor countries and organizations as acting uncoordinated and focusing on single projects, international energy cooperation should be a subordinate instrument with the major task to support national energy policy efforts. National energy policy is understood as an essential factor of an holistic development concept, and therefore it has to account for specific national crises like poverty alleviation, technological and economic development impediments, and environmental degradation. The primary objectives of national energy policy in SSA countries are perceived to be productivity increases in the use of energy, a more efficient energy generation, and an adequate change in the mix of energy resources. The *Yearbook* editors present a new strategy to enforce national energy policy in SSA countries which comprises seven elements:

- Improvement of the macroeconomic and sectoral frame of energy policies;
- increasing consideration of environmental impacts of energy provision; i.e. supporting energy efficiency programs, technological progress and environmental management;
- promotion of industrial capabilities with regard to efficient energy generation and efficient energy use;
- environmental management of rural energy resources;
- promotion of renewable energy technologies and their diffusion;
- financing and institutional reform;
- improvement of planning, evaluation, and monitoring instruments.

Due to the many failures and setbacks in the field of energy cooperation with international donor countries and organizations, the editors of the *Yearbook* do not submit an independent energy cooperation concept. However, it is emphasized that international cooperation is necessary in order to transfer some environmentally sound technologies which are indispensable for sustainable energy use on the African continent. Some energy cooperation projects of the past are described and scrutinized according to their objectives and their realization in order to draw some conclusions from the failures of development cooperation. One fundamental recognition of the editors is that donor institutions often organized their projects in a myopic way from the top down. As a consequence, the choice of technologies was repeatedly unreasonable or a participation of the population on the spot did not take place sufficiently. These factors were major reasons for the fact that the described projects did not come up with overall expectations. Furthermore, it is indicated that donor institutions neglected the environmental impacts of their development projects until the mid-1980s, even though environmental awareness and policy initiatives grew immensely in their home countries since the late 1960s. A further lesson from the past of energy cooperation reads that a renewable energy technology which is reliable and well-tried in developed countries does not necessarily guarantee a successful technology transfer. In the case of small biogas plants a

transfer project failed due to lacking dissemination structures in the recipient country. In view of the presented experiences with technology transfer projects, the editors stress the necessity of considering the country specific political, cultural, and social circumstances on the spot in order to improve the conditions for an adequate organization and realization process of technology transfer. The editors plead for international energy cooperation being based upon participatory concepts and thus they present a NGO methodology which is directed to the needs of the rural population in the villages concerned.

Alternative options for rural energy use are discussed for private households and agricultural activities. Regarding the choice of energy resources for agriculture it is asserted that fossil fuels and the respective technologies do allow for larger productivity gains than traditional methods. In this context, the editors examine the possibilities to combine traditional and mechanized methods. Due to the various ecological characteristics of the soils, the different combinations require specific energy resource mixes if they are to be environmentally benign. In addition to this, the economic and environmental advantages of an agro-forestry approach for SSA countries are presented.

Energy use of private households is dominated by traditional stoves, which are inefficient in the use of the firewood's energy content and which involve serious health impacts for the household members. Two options for an alternative energy resource use are considered. On the one hand, more efficient stoves could yield considerable gains in form of energy resource savings and simultaneously the in-house emissions could be reduced as well. On the other hand it is deemed necessary to tackle with the firewood problem and its environmental consequences. In this regard it would be best to introduce decentralized sustainable management practices of the natural resources which could be performed by the rural communities or by private forest owners.

As a whole, the third volume of the *African Development Perspectives Yearbook* elucidates the significance of an environmentally sound and resource saving energy policy as a crucial element within the frame of a development strategy. The many country studies and examples illustrate that adequate national energy policies could well contribute to steer the SSA countries onto a sustainable development path.

In addition to the focal topic "*Energy and Sustainable Development*" the third volume of the *Yearbook* contains several subject-specific book reviews and book notes as well as articles about current events and developments in SSA in 1992/1993. Among others, it is reported about the UNCED conference, about democratic change processes and the state of economic reforms in selected countries. The *Yearbook* is made complete by printing important documents and addresses with regard to the focal topic energy.