

Agriculture and environment: Some basic considerations for action

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This is a summary of a contribution from FAO to the preparation of the UN Conference on the Human Environment.



PRESENT SITUATION AND PROBLEMS

Over half of the world's population are farmers, living and working on small farms, who own, use or manage most of the land and other resources in rural areas. Most of these farmers understand the need to maintain natural resources because they make their living from using them. However, *increasing population and higher expectations lead to demand for more food and force the farmers to a greater use of natural resources and modern technology.* This situation tends to add to the difficulty of ensuring the maintenance of natural resources because:

— *New lands are brought into crop production from pasture and range and new areas for livestock production are taken from forest lands.* These are usually lands of marginal value and/or lands on which problems are unknown. Consequently these lands are particularly liable to multiple forms of deterioration such as accelerated erosion, depletion of productive capacity, and the introduction and spreading of diseases. This also often leads to alterations of the climate and the hydrological cycle.

— *Intensification of crop and livestock production per unit area* by the introduction of high-yielding varieties and additional inputs such as agro-chemicals also creates increased problems of maintenance of both land and plant and animal genetic resources. Agrochemicals may increase problems of pollution and waste disposal.

— *Concentration of agricultural processing and agricultural service industries* puts additional pressure on land resources by encouraging monocultures and intensification of land use. These industries also increase problems of pollution by effluents and wastes. But, at the same time, such concentration may make pollution control easier by the ready identification of pollution sources.

— *Agricultural lands are often wasted by non-agricultural activities: the discharge of wastes from urban areas and industries and the encroachment of urban and industrial areas and transport infrastructures on agricultural lands.*

ASSESSMENT OF PRESENT MEASURES

Present programmes of agricultural development are rarely preceded in developing countries by an appropriate evaluation of resources and their use, and the gathering of statistics and other information. Moreover, *the data from different types of surveys and sectoral studies are generally insufficiently integrated at the planning and project formulation stage. Comprehensive land use planning is often lacking and where it does exist, does not generally involve the local communities.*

Land use legislation, agrarian laws, zoning ordinances, licensing and other regulations are playing an important role but are often insufficient to prevent misuse of agricultural lands. *Such legislation is specifically use-oriented and not resource-oriented. It is not supported by comprehensive land use plans and taxation policies.*

Moreover, *education, training, research, technical assistance and extension programmes are not adequate to meet the requirements of environmental protection arising from the technological changes in agriculture. Credit availability and credit use, and existing structures of tenure and taxation often limit the small farmers' ability to ensure the maintenance of the land resources and avoid deterioration of the environment.*

However, *when compared with other human activities, a well managed agriculture still plays in general a positive role in the maintenance and conservation of natural resources. It also contributes to a better balance in the environment and to recycling wastes.*

MAJOR AREAS FOR ACTION

a. Reducing the knowledge Gap

Because the demands of the expanding population and the desire for higher standard of living will probably continue to force adoption of technology at a rate faster than it can be tested and taught, and



because there will be a need for higher standards of knowledge and technology, major recommendations are made in the areas of research, surveys, monitoring, education and training.

— *Basic multidisciplinary research* should be continued for a better understanding of the effects of environmental factors and technological inputs on the physical and biological productivity of agricultural ecosystems. More emphasis should, however, be placed on making use of the findings of these investigations to increase agricultural production with minimum damage to the environment, and on understanding the human and social factors in the stability of the ecosystems.

— *Adaptive research and experimentation in new technologies* under local ecological and social conditions should be directed not only towards maximizing agricultural production but also towards a better conservation of the resources and a better control and recycling of wastes.

— *Methods of determining the costs of pollution and other forms of environmental damage to agricultural lands* should be developed as part of the environmental criteria in evaluation of projects and programmes of agricultural development in farm management, and in preparing new legislative and institutional arrangements for environmental protection.

— *Surveys and inventories of basic natural resources* for agriculture should continue with a view to promoting a safer transfer of technologies between areas with similar ecological conditions. The collection of basic data on natural resources should, therefore, be associated with the gathering of information on the possible utilizations of these resources. International agencies concerned should play an increasing role in promoting the collection and exchange of such practical information and data. Much of these data, of course, will have to be collected by ground surveys and assembled and used locally.

— *Multipurpose assessment of land capabilities for use* should be based on comprehensive and integrated surveys of land resources (soil, vegetation, climate, livestock, wildlife, etc.) including social and institutional surveys, and on findings of research and other information indicated above. This should lead to identification of major land use problem areas (environmental in particular) and serve as a guide for more intensive research for land use planning and land management programmes.

— *Local ad hoc monitoring activities* should be established whenever there is a major change in land use. A series of periodic "on the spot" surveys should be made not only to record pollution and other forms of land degradation, but also to review the data previously collected and to assess the environmental impact of changes such as in living conditions, farm organization, distribution of income, credit availability, markets and taxes. These activities should be closely associated with

the monitoring of the performances of farmers and the effectiveness of agricultural statistics.

— Taking into account the diversity of local agricultural conditions, *national and global monitoring of the rural environment* should be confined to those aspects which can usefully be considered at the national and international level: the climate, the balance of natural resources used for agriculture with the amount and nature of agricultural inputs, the quantity and quality of agricultural products available and the agricultural wastes. *These national and international monitoring activities should be first established on a pilot and sectoral basis* before considering their integration into more comprehensive systems. Full use should be made of existing institutions at national and international level in establishing these monitoring activities (for example, agricultural research and experimental stations existing in developed and developing countries).

— *Teaching of basic ecological principles in agricultural education* should be given more emphasis and specialists in the field of agriculture should receive a more *multidisciplinary education and training*.

— *The education of the public* is an essential aspect in maintenance and improvement of the environment. People must be taught to appreciate the seriousness of the situation and to accept and support the regulations prepared to control infringements.

b. Improving Land use Planning

Rural land use planning can be a most effective device for guiding the development and management of natural resources so as to give greatest protection to the environment.

— *Rural land use planning should be a dynamic and flexible process* by which plans can be continuously adapted to economic and social development requirements and new technologies and revised on the basis of the findings from the research, surveys and monitoring indicated above.

— Although land use planning is primarily a national responsibility, *an important part of the rural planning process should be carried out at the local level* involving local communities and taking into account the diversity of the rural environment. Moreover, due to environmental considerations (air pollution, water use, etc.) border lands will increasingly require *joint planning by neighbouring countries*. Appropriate methodologies should be developed for this purpose.

— *The costs of environmental damage and benefits from maintaining and improving the quality of the rural environment* should also be taken into better account in the planning.

— The importance of *good management*

of land and arrangements for the training of people in this skill should be part of any land use planning programme.

c. Improving Land Management

Land management programmes have a direct effect on the lives of people and on the environment. Generally, however, they are specific to an area or a region, so a listing of recommendations must necessarily be illustrative.

— When based upon a sound and comprehensive land use planning policy, *appropriate institutions, land use legislation, licensing and regulations* can be most effective in implementing land management programmes which can prevent deterioration of the rural environment. As considerable progress is still required in this respect, exchange of national experiences and harmonization of national institutions and legislation with the assistance of the international organizations concerned should play an increasing role in improving on a global scale the management of agricultural lands and consequently the rural environment. An integral part of this process must be the organizational arrangements for integration of efforts for environmental improvement.

— In most countries, farmers, and especially the small farmers of developing countries, will require technical guidance and extension, and assistance in the form of credit, and better marketing facilities and sometimes also more land so that they may safely and profitably use modern technologies. With such help, farmers will be able to introduce improvements of the rural environment, adopt better land management and conservation practices and undertake improvement work on their farms. *Modern mass media of information and communication* should be increasingly used in extension work to reach the greatest number of farmers when trying to introduce improved practices of land resource management.

— These actions should be supplemented by *regulatory legal and institutional arrangements* (such as taxation, liability for damage, special assessments, etc.) in order to allocate the costs of environmental deterioration to those responsible for or benefiting from the deterioration and to enforce the legislative provisions for the protection of natural resources.

— As it is increasingly recognized that *many side benefits are derived from the maintenance of natural resources* (production of food in sufficient quantity and of satisfactory quality, recreation, buffer zones between urban concentrations, employment, etc.), the role of agriculture in maintaining the quality and attractiveness of rural areas will therefore become more and more recognized as an activity of general public interest. This may lead the governments and international organizations concerned to increase technical and financial assistance to help the farmers to fulfil their responsibilities in protecting and maintaining the quality of the global environment.