MAN AND THE BIOSPHERE PROGRAMME

unesco

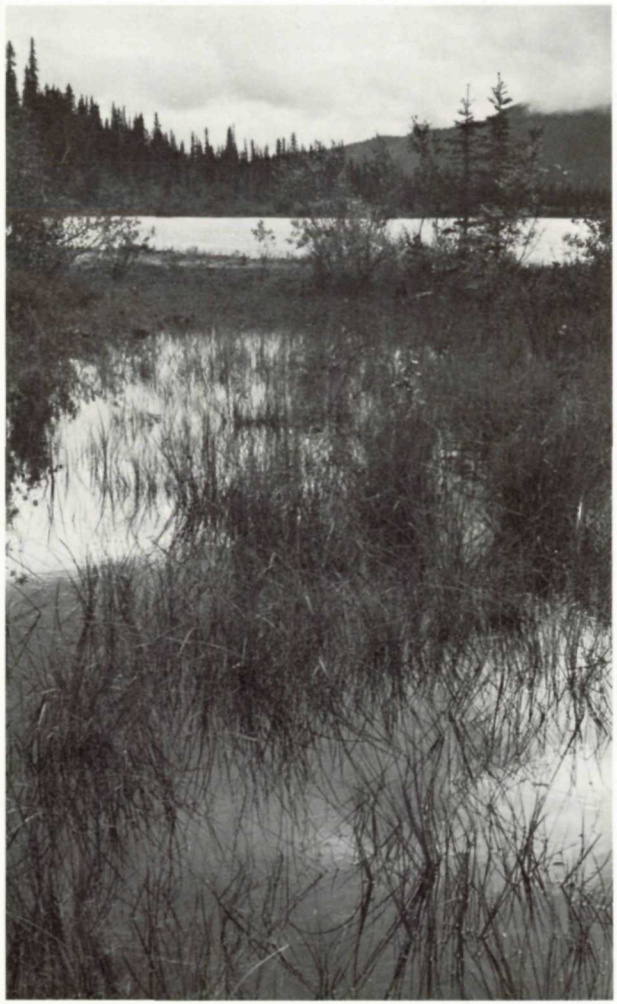
MaB

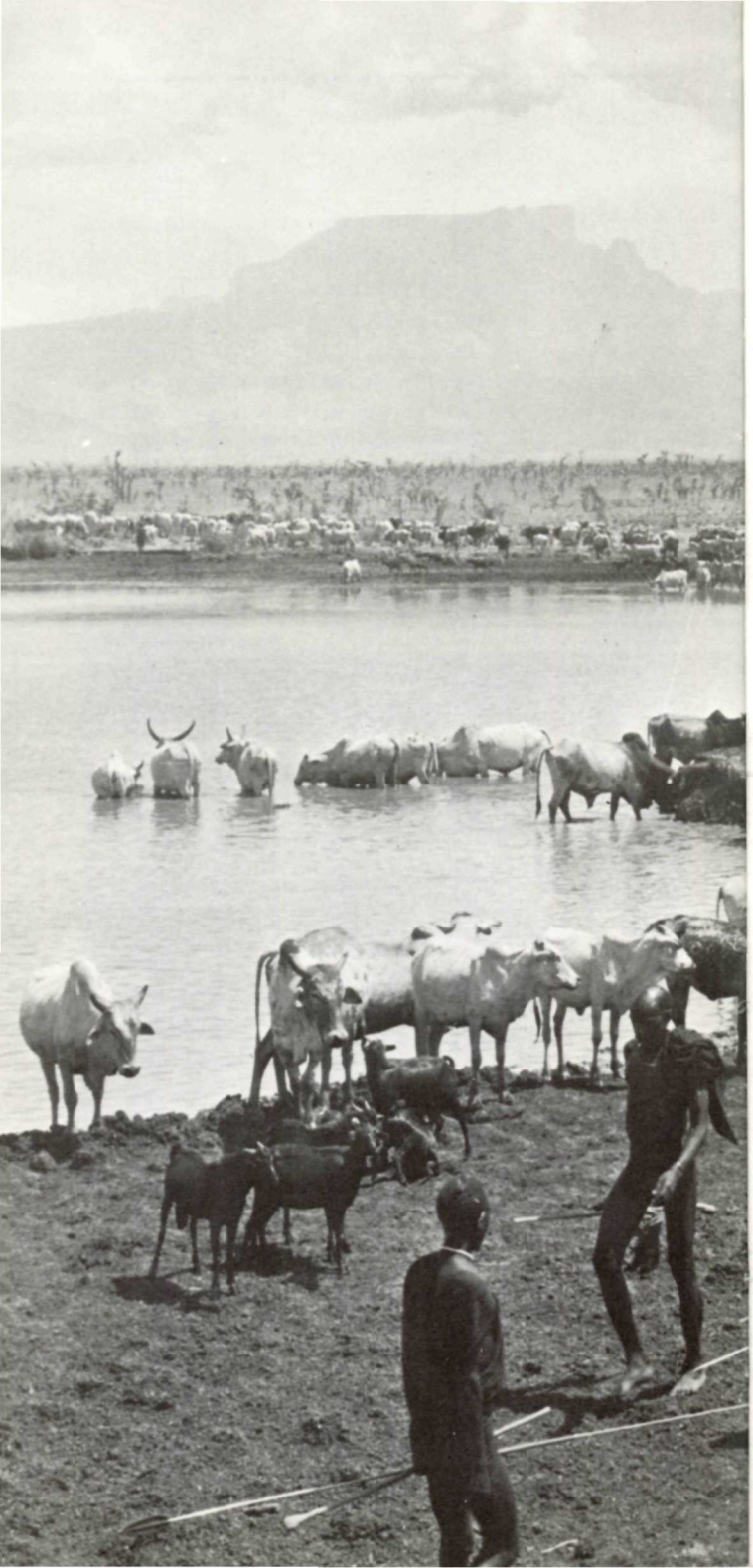
Published in 1980 by the United Nations
Educational, Scientific and Cultural Organization
7, place de Fontenoy, 75700 Paris

Printed in France
Imp. D'HAUSSY TOURCOING 65 B 84

*What is **MAB**?*

MAB is an international programme of research and training. Its aim is to provide the scientific knowledge and trained personnel needed to manage natural resources in a rational and sustained manner. Thus MAB is studying not only the impact of man on the environment, but also the repercussions of environmental modifications on man. MAB was launched in November 1971 by the United Nations Educational, Scientific and Cultural Organization (Unesco). It has no closing date.





Problem-oriented ***Research*** *to meet the needs of planners and managers*

Research under the MAB Programme is designed to help provide the kind of information needed to solve practical problems of resource management. It also aims to fill the still significant gaps in our understanding of the structure and functioning of ecosystems and of the impact of different types of human intervention. Until now, a great amount of research on the natural environment and resources has not been relevant to practical management problems. Often the focus has been too sectoral and results have not been applicable to other ecological or socio-cultural circumstances. By co-operating through MAB, government planners, scientists and managers can obtain fresh insights which will help them in taking resource management decisions.

*An **Interdisciplinary** approach to address complex problems*

Research dealing with the complex problems of resource management requires the knowledge and experience of many disciplines. The intermingling of disciplines is the essence of MAB. This approach makes it possible to consider the many factors involved in a given situation and the interrelationships among them.

Examples of the types of problems being studied within MAB are:

- migration of people from the highlands for the settlement and use of lowlands in the tropics.
- confrontation of pastoral and agricultural practices in the arid zones.
- conflicting interests of tourism, industry and traditional agriculture and forestry in mountain or coastal areas.
- interaction between cities, considered as ecological systems, and their surrounding environments.

International scientific co-operation benefits all countries

By encouraging the co-ordination of research projects, MAB helps to utilize scarce manpower and financial resources more efficiently. Duplication is avoided by sharing research responsibilities among the projects. Through international networks of field research projects, MAB also provides the framework for the testing and application in other countries of research results gained in a particular project. Contacts are thus facilitated among scientists world-wide, by offering new perspectives for direct participation in research in other countries and through technical workshops and exchange of information. Co-ordinated research yields an overall scientific output which is greater than that of the sum of national contributions.

An Intergovernmental programme based on national priorities

The international MAB programme is built on national priorities and initiatives. MAB operates through National Committees established by Member States of Unesco. In this way, governments, in association with scientists, play a role in planning and executing research and training programmes. This association helps ensure that MAB research addresses the most urgent needs of countries as determined by planners and managers without overlooking major scientific factors. Decision-makers will thus be able to apply the research results once they become available. An intergovernmental programme also makes it easier for two or more countries to finance and complement research and training projects.

Some causal factors in desert encroachment, based on the MAB Integrated Project on Arid Lands (IPAL) at the Mt. Kulal Biosphere Reserve in northern Kenya. The diagram illustrates the complexities of the problems to be tackled, if desertification in this region is to be arrested and reversed.

Source: H. Lamprey. 1978. The Integrated Project on Arid Lands (IPAL). *Nature and Resources*, Vol. XIV, No. 4, October-December 1978, pp. 2-11.

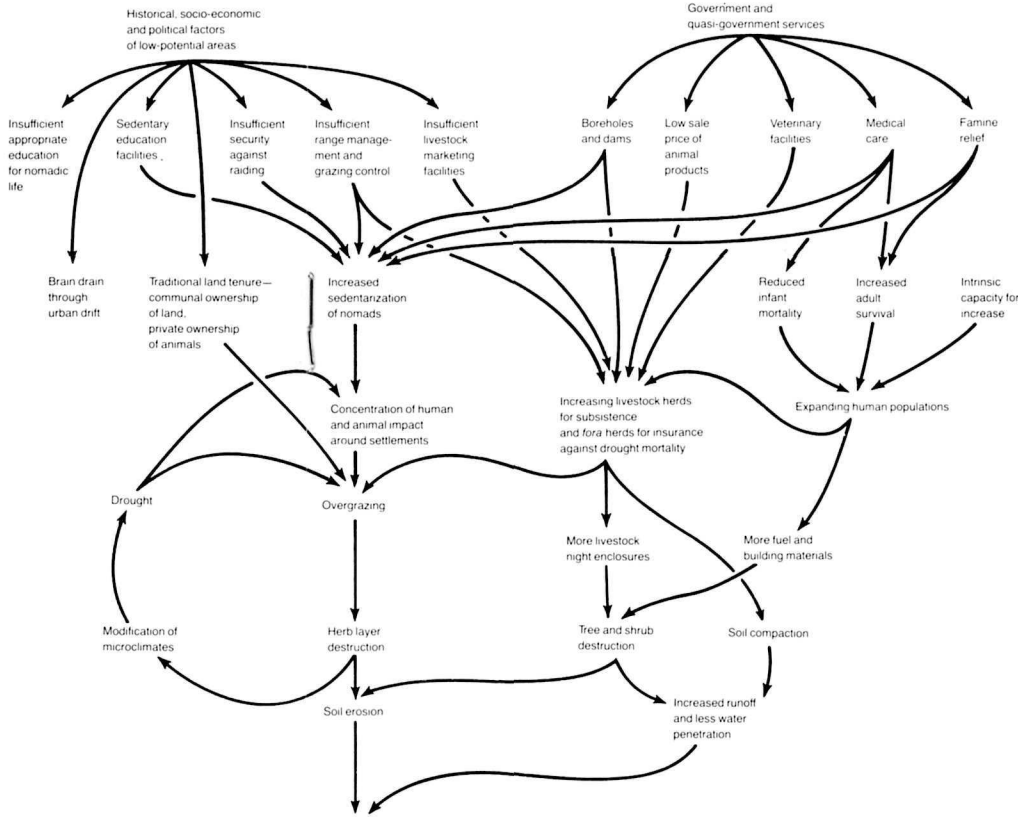
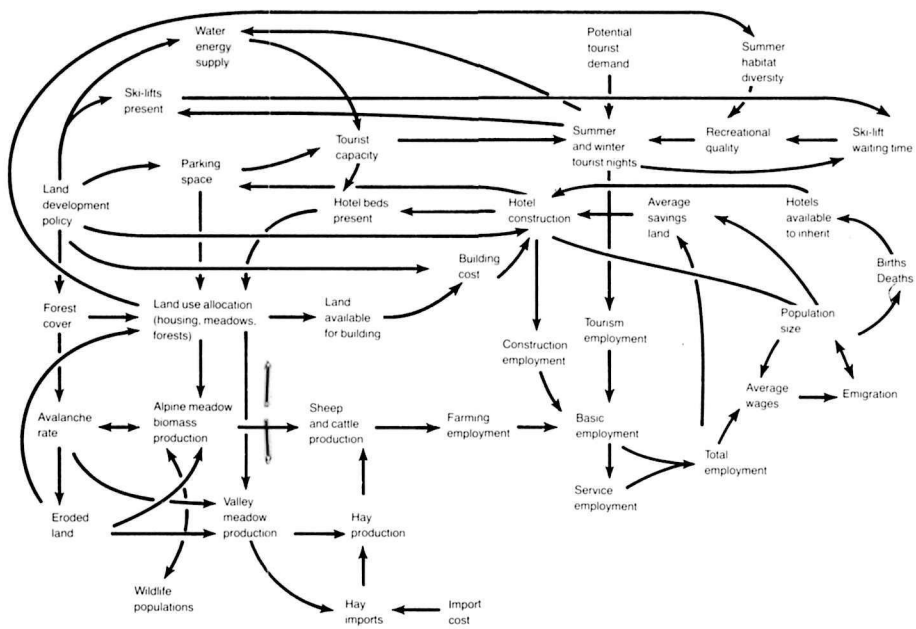


Diagram showing the many interlinked factors which have to be taken into account in planning for the balanced development of even a small, well-defined community like the village of Obergurgl in the Austrian Alps. Alteration of any one of those factors may have complex and sometimes unexpected repercussions on the others.

Source: Diagram from "Alpine areas workshop on the Obergurgl model" by Franz and Holling © IIASA, 1974, Laxenburg, Austria.



MAB field projects

In co-operating countries field research projects are being carried out under the sponsorship of MAB National Committees. In mid-1980, there were 944 projects in 74 countries, with over 10,000 participating scientists. These interdisciplinary projects focus on concrete problems of resource management and involve both the natural and social sciences. They may vary in complexity and duration. Among them are a number of "pilot" projects which have regional or international significance. MAB projects in similar ecological zones are linked through regional and international networks so that ongoing research can be co-ordinated and information exchanged. Flexible and inexpensive mechanisms, such as consultations between research workers and exchange of personnel, help co-ordinate research. These projects often profit from the valuable experience and knowledge of scientists and institutions of other ecological zones where similar research may have been undertaken.

In addition to research, MAB sites are often used for demonstration and training purposes, not only for scientists but also for government officials, planners and technicians. In some cases, local populations participate in the planning and implementation of MAB research. The information provided through research can also be used for environmental education activities.

Training *through MAB*

Many developing countries lack a core of trained specialists in the ecological and related sciences to carry out the problem-oriented MAB research. Moreover, some of the training received by students from developing countries has not been relevant to the goals and priorities of their countries or to the particular problems and needs encountered in their economic development.

Training therefore is a key element of MAB and is closely linked to the research programme. A growing number of training activities are being carried out in developing countries themselves, under the ecological and socio-economic conditions which the trainees will face in the future management of their country's land and resources. Sites of MAB field projects are increasingly being used for training purposes. Students thus have the opportunity to learn by observing or actively participating in research.

Different types of training activities are associated with the MAB Programme:

- international post-graduate training courses (organized in developed countries for students from developing countries)
- international seminars
- regional training courses, seminars and workshops in developing countries
- study grants
- *in situ* training linked to research.

Improving information flow

A major objective of MAB is to transmit scientific information relating to resource management to those who can make use of it. One important aspect of this task is to present the scientific and technical information in a form which can be understood and used by planners, decision-makers, educators and others. MAB is also trying to help in the exchange of data among scientists in regions which share similar socio-economic problems and ecological conditions.

MAB information materials

A computerized information system for field research projects, biosphere reserves, and research publications supplies detailed information on research sites, objectives, participating scientists, etc. The *MAB Technical Note Series* provides methodological guidelines for integrated ecological research, usually with contributions by specialists on a given subject. Two world-wide *State of Knowledge Reports* have been published, one on tropical forest ecosystems and another on tropical grazing lands. *The MAB Report Series* contains the reports of expert panels, international working groups and task forces convened during the planning phase of MAB, as well as reports of regional and subregional meetings and of MAB Council sessions. The *MAB Audio-visual Series* comprises slide-tape programmes on various themes dealt with by the MAB Programme. All of these information materials on MAB are produced in several languages. In addition, the co-operating countries themselves produce many scientific publications, brochures, newsletters, films, slide-tape shows, etc.

Biosphere reserves

An international network of protected areas—called biosphere reserves—has been established under the MAB Programme. A country's sovereignty is in no way affected by the creation of a biosphere reserve. Proposed sites are nominated by countries themselves for review by the MAB Bureau and final approval by Unesco. The MAB biosphere reserve programme complements other international conservation efforts.

Biosphere reserves are selected not for their uniqueness but because they are representative of particular ecosystem types. Through this international programme, all the ecosystems and biogeographical provinces of the world are being systematically covered. By mid-1980, 177 sites in 46 countries had been designated as biosphere reserves.

Conservation is one major objective of biosphere reserves. An integrated concept of conservation is being developed—the conservation of ecosystems, including all the species within them. A biosphere reserve contains both natural areas and areas modified by human activity. Thus there is an untouched "core" area and a "buffer" zone where both experimental and manipulative research is carried out.

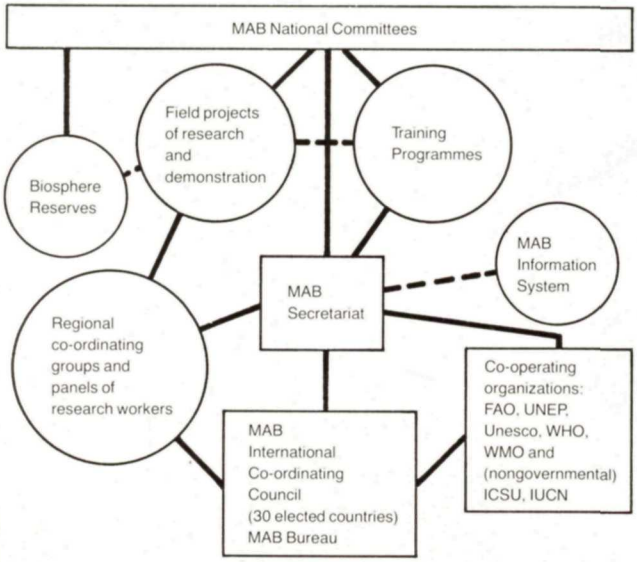
Long-term research is being undertaken in biosphere reserves on the structure, functioning and dynamics of ecosystems and on comparisons between ecosystems, thereby providing baseline data for other MAB research projects. Biosphere reserves are also used for monitoring environmental change over time. Training, education and information exchange activities also take place in biosphere reserves.

Local populations are often associated with the management of these reserves and are sometimes involved in the research being undertaken within them. This is an important aspect of the MAB biosphere reserve programme, since man is a part of any ecosystem he inhabits.

The MAB structure

MAB is a decentralized programme operating through a framework of National Committees which co-ordinate MAB activities. Established so far in 95 countries, these Committees are usually comprised of scientists from universities or research institutions and representatives of other public or private bodies concerned with environmental research and management. The International Co-ordinating Council, made up of 30 countries elected by the General Conference of Unesco, is the main policy-making body of MAB. It meets every two years to review and evaluate progress being made in implementing the Programme. A small secretariat, provided by Unesco, ensures overall co-ordination at the international level.

MAB co-operates closely with a number of United Nations and other organizations. These include the United Nations Environment Programme (UNEP), the Food and Agriculture Organization (FAO), the World Health Organization (WHO), the World Meteorological Organization (WMO), the International Council of Scientific Unions (ICSU) and the International Union for Conservation of Nature and Natural Resources (IUCN).



The major MAB project areas

1. Ecological effects of increasing human activities on tropical and subtropical forest ecosystems.
2. Ecological effects of different land uses and management practices on temperate and mediterranean forest landscapes.
3. Impact of human activities and land use practices on grazing lands: savanna and grassland (from temperate to arid areas).
4. Impact of human activities on the dynamics of arid and semi-arid zones' ecosystems, with particular attention to the effects of irrigation.
5. Ecological effects of human activities on the value and resources of lakes, marshes, rivers, deltas, estuaries and coastal zones.
6. Impact of human activities on mountain and tundra ecosystems.
7. Ecology and rational use of island ecosystems.
8. Conservation of natural areas and of the genetic material they contain.
9. Ecological assessment of pest management and fertilizer use on terrestrial and aquatic ecosystems.
10. Effects on man and his environment of major engineering works.
11. Ecological aspects of urban systems with particular emphasis on energy utilization.
12. Interactions between environmental transformations and the adaptive, demographic and genetic structure of human populations.
13. Perception of environmental quality.
14. Research on environmental pollution and its effect on the biosphere.

Photo credits:
Cover: Unesco/Jack Ling
Page 1: National Park Service/Woodward Williams
Pages 2 and 13: Unesco/J. H. Blower
Page 5: Gisbert Glaser, Paris
Pages 6 and 7: Angela Beretta, Italy
International Photo Competition U.N.—FIAP
Page 14: J. Beatty, U.K.