

# THE UNITED NATIONS UNIVERSITY

## WH

### WORLD HUNGER PROGRAMME

- ◆ Food and nutrition objectives in national planning and development
- ◆ Post-harvest conservation
- ◆ Protein and energy needs in developing countries
- ◆ Iron deficiency anaemia and its prevention

## HSD

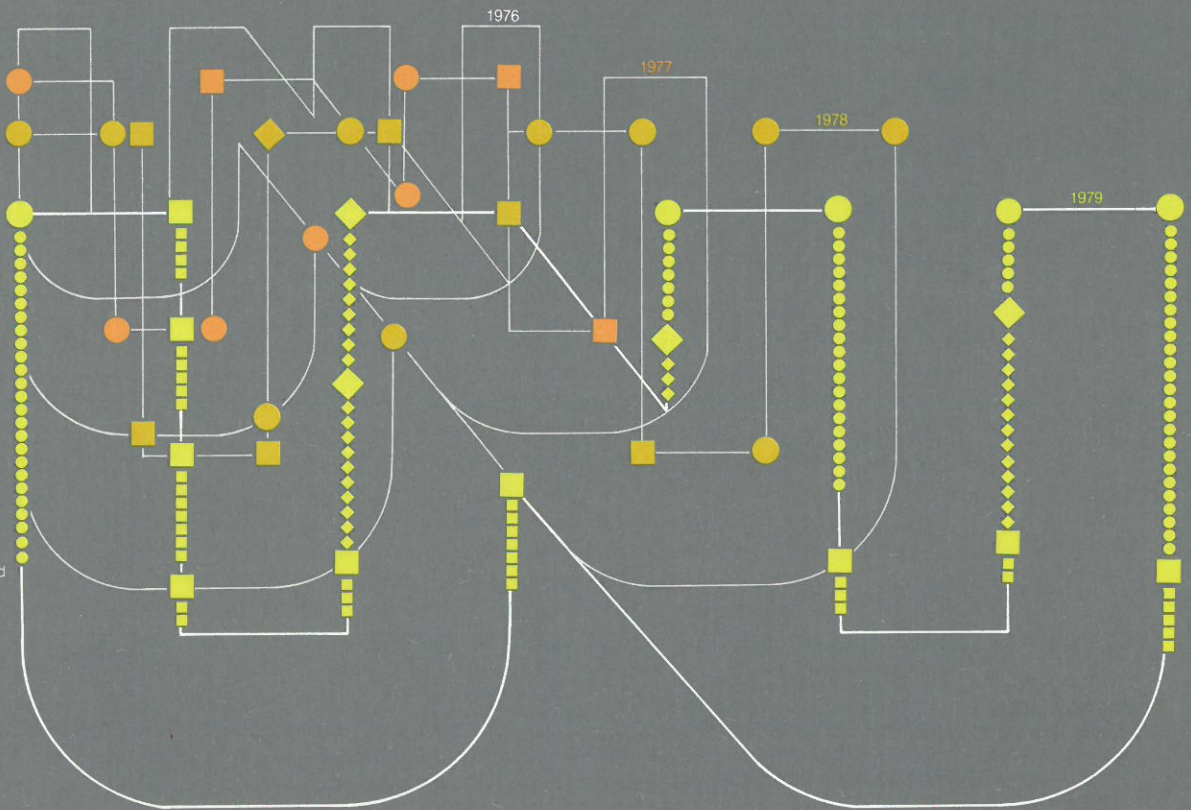
### HUMAN AND SOCIAL DEVELOPMENT PROGRAMME

- Goals, processes, and indicators of development
- Socio-cultural development alternatives in a changing world
- Sharing of traditional technology
- Research and development systems in rural settings
- Technology transfer, transformation, and development: the Japanese experience

## NR

### PROGRAMME ON THE USE AND MANAGEMENT OF NATURAL RESOURCES

- Solar energy
- Geothermal energy
- Arid lands
- Rural energy systems
- Agro-forestry systems
- Highland-lowland interactive systems
- Water-land interactive systems
- Coastal resources systems
- Resource systems theory and methodology



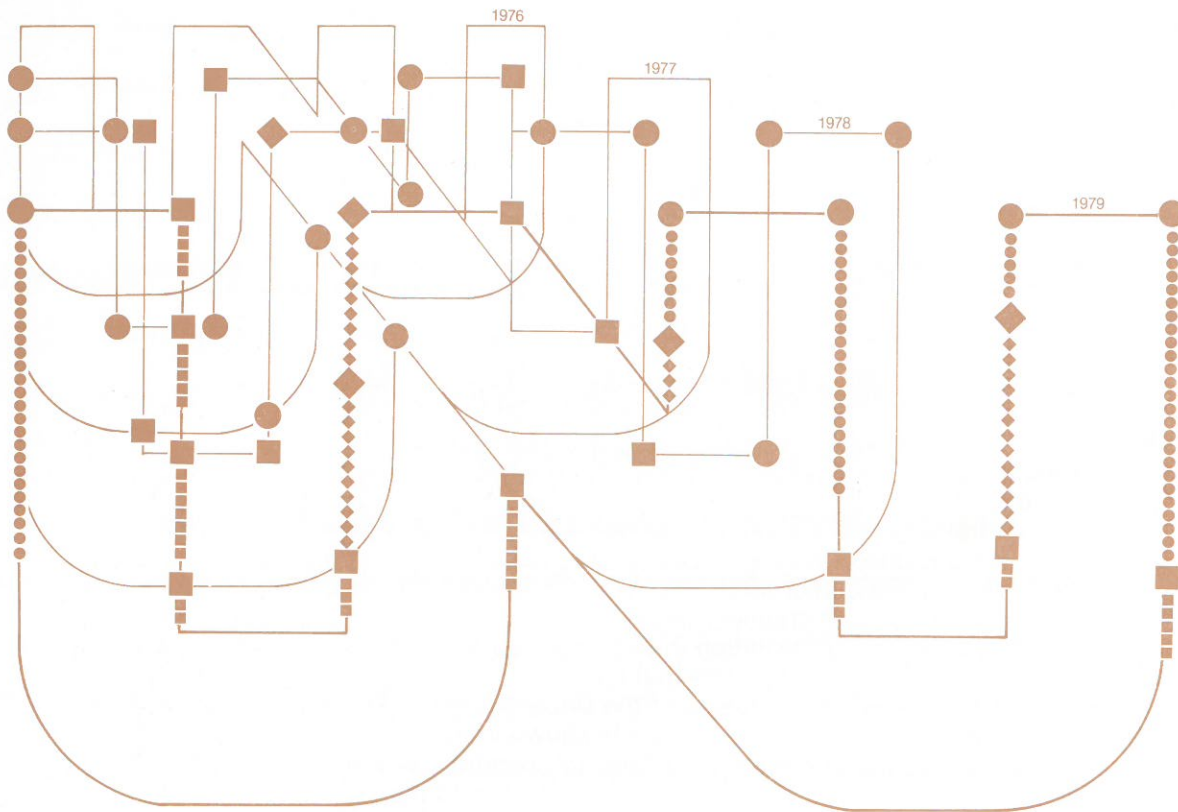
"Eighteen networks are now in operation: 4 in World Hunger, 5 in Human and Social Development, and 9 in Natural Resources. They link together scientists and scholars working on projects in some 60 countries and collaborating on problems that transcend national boundaries."

*From the Annual Report of the Council*



THE FOURTH YEAR

1978—1979



The front cover design, reproduced above, shows the growth of the UN University's networks over four years. The World Hunger Programme became operational in early 1976; the Human and Social Development Programme in late 1976; and the Programme on the Use and Management of Natural Resources in late 1977.

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For details of the networks, see pages 5 and 6.

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Centre pages (white): Report of the Council

## MESSAGE FROM THE RECTOR

Four years is not a long time in the life of a new institution—particularly one given the ambitious assignment of organizing world-wide networks of institutions and individual scholars to help elucidate and solve some of the world's most pressing problems. None the less, as my colleagues and I reflect on the progress made by the United Nations University during its fourth year, we believe there is evidence that the University is becoming securely established and beginning to make effective contributions in its fields of work. I hope readers of these pages will share this view.

The University has now organized eighteen networks (facing page) involving more than one hundred institutions in more than sixty countries in generating new knowledge, providing advanced training, and disseminating the results of its work.

The University is designed to help correct three structural defects in world-wide science and scholarship. One defect results from global imbalances in human and material resources devoted to the creation, transformation, and application of knowledge. A second defect results from fragmentation in the organization of knowledge, and a third from the geographical and cultural divisions that inhibit effective scientific and scholarly collaboration. Each of the three programmes of the University gave evidence during the year of its potential to help remedy these defects—as is shown in some detail in this publication.

The World Hunger Programme (which has been in operation for three years and is the oldest of the programmes) made a significant contribution to the understanding of nutrition needs in the developing countries during the year with the publication of its first major research results. The Human and Social Development Programme has been able to organize a systematic dialogue among different schools of thought on development problems—and to obtain valuable insights through this process. The youngest of the three programmes, on the Use and Management of Natural Resources, effectively established its presence this past year on the global basis required to understand the complex interplay of energy and environment on this finite planet.

The United Nations Conference on Science and Technology for Development (UNCSTD), held in Vienna in August, in which the University participated, underscored the timeliness and importance of a new kind of academic institution through which scholars and scientists from all the world's traditions and disciplines can collaborate. The University stands as a ready instrument, with proven institutional and organizational capabilities, to help implement the initiatives called for by the world community at UNCSTD.

The United Nations University has completed the first phase of its programme activities and is beginning to formulate a medium-term plan. Many of its UNU Fellows are now in positions of influence in institutions and agencies of the developing countries—their intellectual capabilities strengthened by their UN University training. University-generated knowledge is flowing to many parts of the world where it is badly needed. This unusual and highly useful instrument of science and scholarship created by the United Nations is now a working reality.

**James M. Hester**

## HIGHLIGHTS OF THE FOURTH YEAR

The University signed association agreements with 9 institutions to conduct advanced training and research—bringing the total number of associated institutions to 23. Eight of the new associations are in the rapidly expanding Programme on the Use and Management of Natural Resources, the last of the University's three programmes to begin operation. Of the University's 23 associated institutions, 15 are in developing countries and 8 are in industrialized countries.

Some 1,400 scholars, scientists, and policy-makers participated in various types of meetings organized by the University. A total of 49 programme meetings were held in 26 countries. The final two consultative meetings, in the series of 14 meetings initiated in London in October 1976 to acquaint the world-wide academic community with the nature of the University, were held at Accra and Nairobi in March. They were attended by 150 academic and government leaders from 22 African nations.

Among the most distinctive features of the University is its world-wide networks of scientists and scholars collaborating on problems that transcend national boundaries. There are now a total of 18 networks in operation, 4 in World Hunger, 5 in Human and Social Development, and 9 in Natural Resources.

The publications programme grew considerably as the results of the University's initial research activities became available. Two periodicals were launched: the *Food and Nutrition Bulletin*, published quarterly, and *ASSET (Abstracts of Selected Solar Energy Technology)*, published monthly. The University also issued 30 other publications designed to inform scientists and scholars about the work of its programmes.

Of the 97 UNU fellowships granted over the last three years, 47 began during the past year. Forty-four Fellows completed their training during the year and are now working in home institutions in developing countries. They are tangible evidence of the University's efforts to strengthen the academic and scientific resources of the developing world.

Joint activities among the University's three programmes were inaugurated. The World Hunger and the Natural Resources programmes joined in an important assessment of the field of biomass conversion at a workshop in Guatemala in November 1978. In March 1979 at the Massachusetts Institute of Technology, the World Hunger and Human and Social Development programmes jointly conducted an examination of the problem of identifying alternative goals, processes, and indicators of food and nutrition policy.

The base of the University's financial support was considerably broadened. The United Kingdom pledged £5 million (approximately US\$9.8 million) to the Endowment Fund, the Federal Republic of Germany pledged DM 8 million (approximately US\$4.3 million), and Thailand pledged US\$0.5 million. Eighteen other countries made pledges or contributions of an annual type. Twenty-eight Governments have now pledged or paid a total of nearly US\$142 million to the Endowment and operating funds.

The United Nations Conference on Science and Technology for Development (UNCSTD), held in Vienna in August 1979, provided an occasion for the University to demonstrate its role in strengthening scientific and technological resources in the interests of development, and to improve awareness and understanding of its activities among government and scientific leaders. The Rector made a statement to the UNCSTD plenary session, and the Vice-Rector for the Human and Social Development Programme gave a keynote address to the ACAST Colloquium of international scholars and scientists which preceded it. In addition to staff members who attended, a number of scholars associated with the University (Council members, Programme Advisory Committee members, and others) also participated in UNCSTD and the Colloquium.

\* Material in this publication has been drawn largely from the Report of the Rector to the Council of the United Nations University (included as Annex IV in the 1978-79 Report of the Council of the University to the General Assembly of the United Nations).



The United Nations Conference on Science and Technology for Development (UNCSTD), held in Vienna in August 1979, provided an opportunity for the University to increase awareness of its activities in the international community. In his statement to the UNCSTD plenary session, the Rector (inset) noted that the University was "a ready instrument at hand" to help further the purposes of UNCSTD.

# HOW THE UNIVERSITY OPERATES

The governing principles and policies of the University are determined by a 24-member Council appointed jointly by the Secretary-General of the United Nations and the Director-General of UNESCO. Council members serve as individuals and not as government representatives. Programme activities are developed with the help of advisory committees drawn from leaders in the international academic community. A small headquarters staff in Tokyo plans and co-ordinates the University's work.

The University does not have students and faculties in the traditional sense. Instead, it links and co-ordinates the work of scientists and scholars in institutions around the globe by organizing networks that focus on particular problems. There are 18 such networks now in operation. Their size and geographical spread vary—some encompass the globe, others focus on a particular region.

Research and training are carried out in more than 60 countries at associated institutions, at research units, and by Fellows appointed for advanced training. Information generated is disseminated through workshops, seminars, publications, and other methods.

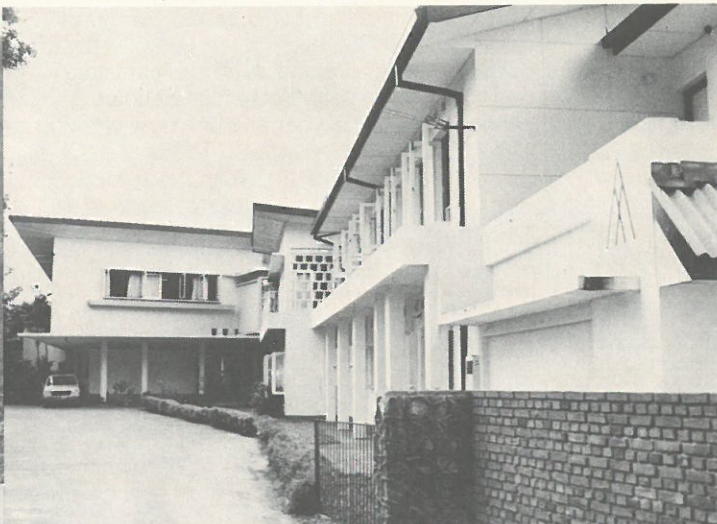
In its relations with other institutions, the University seeks mutually beneficial partnerships, maximum flexibility, and avoidance of rigid formulae. Policy guidelines provide for three basic types of relationships: **incorporated institutions**, which would be established and staffed, managed, and financed by the University itself; **associated institutions**, which are all, or parts, of existing institutions with their own governing authority, associated with the University for specific research and training tasks for a period of time;

and **contractual and other arrangements** with institutions (such as research or training units) or individuals for specific programme purposes.

**UNU Fellows** are selected for their potential to help strengthen their own country's intellectual capabilities following a period of research and advanced training at one of the University's associated institutions or training units. The fellowships are intended to develop skills in multi-disciplinary applied research and policy formulation needed in institutions in developing countries.

The University gives central importance to the task of strengthening institutional and individual research and advanced training in the developing world—where today's pressing problems are most starkly manifest—with the aim of helping developing countries to become more self-reliant in solving problems. It also seeks to broaden the outreach of individual scholars and institutions by involving them in co-operating networks dealing with global problems. It supports all these efforts with research grants to individuals and institutions wherever the programme objectives of the University can be met most effectively.

As a general principle, the University seeks to draw on expertise from all parts of the world. One important way in which it does this is through its Programme Advisory Committees. Membership of the Advisory Committees changes at fixed intervals to ensure the broadest possible participation by scholars representing all cultures and regions. Those who have served on the Advisory Committees to date have come from 33 countries. The current membership is listed on pages 33 and 34.



The University organizes world-wide networks of co-operating scholars and institutions to undertake research, advanced training, and dissemination of knowledge. The focal points of the networks are associated institutions which co-ordinate research projects and train UNU Fellows; knowledge is disseminated through workshops and publications. (Counterclockwise): Marga Institute, an associated institution in Sri Lanka, which co-ordinates an eight-nation study of traditional technology by the Human and Social Development Programme; a UNU Fellow from the Philippines at the Natural Resources Programme's geothermal energy training centre in Iceland; a World Hunger Programme workshop in Hungary for scientists from Scandinavia and Eastern Europe.

# PROGRAMME NETWORKS

## ■ World Hunger Programme

Food and Nutrition Policy and Programme Planning

**Food and nutrition objectives in national planning and development:** associated institutions in Canada, Chile, Ghana, Guatemala, the Philippines, and the US with links to institutions in Australia, Colombia, and the Philippines.

Post-harvest Conservation of Food

**Post-harvest conservation:** associated institutions in Canada, Guatemala, Ghana, India, and the UK with links to a training unit in Japan and to institutions in Colombia, Indonesia, Mexico, and Senegal.

Nutritional Needs and Their Fulfilment through Local Diets

**Protein and energy needs in developing countries:** associated institutions in Chile, Ghana, Guatemala, and the US with links to institutions in Brazil, Colombia, India, Japan, Mexico, the Philippines, Republic of Korea, Thailand, and the UK.

**Iron deficiency anaemia and its prevention:** associated institution links in Chile, Guatemala, and Venezuela.



## ● Human and Social Development Programme

### Problems of Development

#### **Goals, processes, and indicators of development:**

co-ordinated by associated institution in Switzerland with links to institutions in Argentina, Belgium, Canada, 2 in the Federal Republic of Germany, India, 2 in Italy, Jamaica, Japan, Malaysia, Mexico, New Zealand, Norway, Papua New Guinea, Poland, Romania, Senegal, Sri Lanka, Sweden, Switzerland, Tanzania, the UK, and the US.

#### **Socio-cultural development alternatives in a changing world:**

co-ordinated by an institution in France with links to institutions in Bangladesh, Canada, Egypt, Fiji, France, India, 2 in Japan, New Zealand, Nigeria, Peru, Poland, Spain, Thailand, Trinidad and Tobago, Tunisia, 2 in the UK, and the US.

### Technology and Development

**Sharing of traditional technology:** co-ordinated by associated institution in Sri Lanka with links to institutions in Indonesia, Japan, Malaysia, Nepal, the Philippines, and Thailand.

#### **Research and development systems in rural settings:**

co-ordinated by associated institution in Mexico with links to institutions in Brazil, Ethiopia, Mexico, and the Philippines.

#### **Technology transfer, transformation, and development: the Japanese experience:**

co-ordinated by associated institution in Japan with links to 35 other institutions in Japan.

## ▲ Programme on the Use and Management of Natural Resources

### Energy for Rural Communities

**Solar energy:** Information centre, Japan (ASSET), associated institution in Algeria with projected links to institutions in Brazil, India, Mali, Tanzania, the US, and Upper Volta.

**Geothermal energy:** associated institution in Iceland with projected links to an institution in Japan.

### Assessment of the Application of Knowledge to Arid Lands Problems

**Arid lands:** links associated institutions in the Sudan and Australia with projected links to institutions in Chile, India, Mexico, Middle East, and Peru.

### The Ecological Basis for Rural Development in the Humid Tropics

**Rural energy systems:** associated institution in Nigeria with projected links to an institution in Malaysia.

**Agro-forestry systems:** associated institutions in Costa Rica and Thailand with projected links to an institution in Cameroon.

**Highland-lowland interactive systems:** associated institutions in Thailand and the US with links to institutions in Nepal, Papua New Guinea, and a projected link to an institution in Switzerland.

**Water-land interactive systems:** associated institution in Indonesia with links to an institution in the Philippines and a projected link to institutions in Japan and the People's Republic of China.

**Coastal resources systems:** research and training unit in Jakarta with projected links to Fiji and Nouméa.

### Resource Systems Theory and Methodology:

An advanced training and research network which links work being done in the Natural Resources sub-programmes. Activities in the Netherlands and projected activities in the People's Republic of China, France, Republic of Korea, and the US.

## COMBINING KNOWLEDGE FROM MANY DISCIPLINES

The University focuses its programmes on aspects of major world problems that can be usefully examined through collaborative work by scientists and scholars from many parts of the world. In addition, because the University's efforts are concerned with finding practical solutions and not just gathering specialized data, it must combine knowledge from many disciplines. It seeks to add new dimensions to work being carried out by other national and international organizations in the fields of hunger, development, and natural resources.

A major component of the World Hunger Programme, for example, is national food and nutrition policy, a subject widely ignored in the past. Another project deals with staggering losses of food after harvest, an area in which there has been only little, highly fragmented research and inadequate training efforts. Another project is concerned with developing comprehensive information on human nutritional requirements in tropical areas of the developing world, where such information has been severely lacking. In all this work, the World Hunger Programme is strengthening the efforts of other organizations concerned with increased food production and better nutrition.

The thrust of the Human and Social Development Programme reflects widespread disappointment with the results of past development strategies aimed primarily at economic growth. The programme is providing a global forum for scholarly debate and evaluation of development strategy alternatives, thereby bringing scientific objectivity to a subject frequently clouded by political controversy. The areas of study being pursued include problems of development and technology for development.

The work of the Programme on the Use and Management of Natural Resources is focused on problems of ecology and energy. Special attention is being given to the humid tropics and to arid lands, huge zones encompassing most of the developing world. In the humid tropics, social, economic, and other changes have put a severe strain on traditional resource systems. The programme seeks to develop better understanding of: (a) rural energy systems; (b) the mixing of trees, crops, and livestock in agro-forestry systems; (c) interactions between land and water, especially in the coastal zones; and (d) ecological, social, and economic interactions between highland and lowland areas. Concerning the problems of arid lands, analysis is being made of the reasons for failure to apply existing knowledge more effectively. In the field of energy, the focus of the programme is on the potential for alternative energy sources (solar biogas, wind, and others) to meet the growing energy demands of rural areas of the developing countries.

Each of the three programmes is at a different stage of development. World Hunger became operational in early 1976; Human and Social Development in late 1976; and Natural Resources in late 1977. Each has devised different methods of operation to suit particular needs. But from the outset, the University has promoted interaction among the programmes in the recognition that real problems can only be fully understood and solved as intimately linked aspects of the human condition. The ecological consequences of deforestation, for example, have clear implications for the food scientist in understanding the underlying causes of hunger, which, in turn, is a consideration for the development strategist. The basic premise of the United Nations University is the growing interdependence of issues, nations, and regions. This interdependence requires new intellectual approaches and new forms of organization of research, advanced training, and dissemination of knowledge which the University is providing.

Four distinct interprogramme activities were launched over the course of the year and several others are in the early formulation stage. Continuing efforts are being made to expand the scope and number of interprogramme activities, and this will continue through such mechanisms as the joint meetings of the Advisory Committees, the second of which was held at the University's Tokyo headquarters in January 1979. The week-long meeting brought together humanists and natural and social scientists from all parts of the world, leading experts in their own fields, who help shape the specific activities of the University programmes. They heard reports on the interprogramme activities to date and discussed ways to promote and implement further interaction.

Four activities were initiated:

### **Bioconversion of Organic Residues for Rural Communities (World Hunger and Use and Management of Natural Resources Programmes)**

In man's efforts to produce food and fibre from plants and animals, literally billions of tons of organic materials (e.g., straw, manure, and various types of husks) are left as wastes. Different village-level technologies have been developed to utilize some of these wastes, but the unrealized potential of these residues is immense because many of them are readily convertible either into energy or high-quality animal feed. Given that the basic transformations to energy or feed are not only similar but often intertwined, this topic was identified as being appropriate for joint activities by the World Hunger and Natural Resources programmes early in 1978.

A task force has been established, and a major conference was held in Guatemala with over 40 participants from 14 countries to examine the state-of-the-art. The proceedings of the Conference are being published, and recommendations have been drawn up regarding further action. An evaluation mission to India identified a number of different projects at various institutions that will be brought into the bioconversion network. Providing that outside project funding is forthcoming, the Institute for Animal Nutrition Research, the Netherlands, will become a joint associated institution of the two programmes (it is already collaborating with the World Hunger Programme) for work on the production of biomass, especially for use as animal feed. Another task force meeting in June recommended that a workshop on the production of feed and energy from rice



straw and sago be held in South-East Asia. An agreement has been worked out with the International Cell Research Organization to co-sponsor two publications—a monograph on the microbial conversion of residues at the village level, and a handbook on tropical fermented foods.

**Solar Food Conservation Systems for Rural Communities (World Hunger and Use and Management of Natural Resources Programmes)**

The Programme on the Use and Management of Natural Resources is actively working to find environmentally sound and socially acceptable ways of overcoming the limited energy supplies available in rural communities, while a priority area in the World Hunger Programme is the development of post-harvest food preservation technology effective in developing countries. Thus, an obvious area of common interest is the use of solar energy to dry agricultural crops, meat, and fish as a means of preservation. Particularly important is the research and advanced training necessary to optimize the speed, efficiency, and reproducibility of this process under varying climatic and geographical conditions, and to match this technology to the cultural, nutritional, and economic requirements for food conservation.

In January 1979, the Advisory Committees of both programmes strongly recommended the establishment of such a joint programme. In June 1979, an evaluation mission to Brazil examined the possibilities of establishing a research and training unit there on solar food conservation. As a result of this mission, a task force meeting at the University of Campinas is being planned. This meeting will bring together staff from the Natural Resources and World Hunger programmes and outside experts to examine the state-of-the-art of solar crop drying, to propose research priorities, and to recommend sites for the joint project.

**Goals, Processes, and Indicators for Food and Nutrition Policy (World Hunger and Human and Social Development Programmes)**

This collaboration is an offshoot of the World Hunger Programme activities in the interfaces of food and nutrition, agriculture, and national planning and the project on goals, processes, and indicators of the Human and Social Development Programme. The two programmes held a joint workshop in March 1979 at the World Hunger Programme's associated institution at the MIT-Harvard consortium, Cambridge, Massachusetts, USA.

**Resource Systems and Traditional Technology (Human and Social Development and Use and Management of Natural Resources Programmes)**

In 1978, the Human and Social Development Programme launched a project on sharing of traditional technology. One of the studies within this project deals with the socio-economic consequences of replacing the traditional slash-and-burn of shifting agriculture with other techniques. From the perspective of the Programme on the Use and Management of Natural Resources, shifting cultivation is a major form of land management that can have severe environmental consequences when fallow periods are insufficient. The consequences of soil erosion and lowered fertility often affect an entire region, either through socio-economic means or direct physical means such as flooding and sedimentation. This shifting cultivation is intimately linked with a number of the resource systems in the Natural Resources sub-programme on the ecological basis for rural development in the humid tropics, and the recognition of these

related interests has led to the development of a joint project.

A relatively remote area on Palawan (in the Philippines) was selected for this joint project, as it fits the conceptual matrix of the sub-programme on sharing of traditional technology, and the traditional resource use systems are closely interrelated. For example, in the uplands, shifting cultivation is still practised, while at intermediate altitudes, crops are grown on the same land annually. In the lowlands there is wet rice farming, and in the coastal area there are brackish water fish ponds. Water and the exchange of foods are therefore only the most obvious of the many links which tie these "vertically distributed" resource systems together. Moreover, these interlinking resource systems are found in a relatively small area, and the products and services involved are utilized primarily for the subsistence needs of the community rather than for trade. Thus this project is serving as a self-contained model for the analysis of production and its seasonal variations, for studies on the perception by the villagers of resource systems and the external factors which may govern their perceptions, and for studies on the decision-making processes in regard to the distribution and use of natural resources, labour, time, and capital. Through the combination of expertise in the natural and social sciences, Human and Social Development and Natural Resources can usefully complement each other.

After the formulation of the joint project, a task force was sent to Palawan in April 1979. This was followed by a biological and physical assessment of the project area. A joint Human and Social Development and Natural Resources meeting in Palawan is scheduled to deal with the analysis of these data and the results obtained in the first phase of the project.

Future plans: Two other programme interaction projects are now in the early formulation stage. One is concerned with the production of food and feed in the context of agro-forestry systems (live fence posts, pasture trees), and will have input from the World Hunger and Natural Resources programmes. Another more theoretical activity will be the convening of a joint Natural Resources and Human and Social Development workshop to consider the utilization of energy as an indicator, or even a goal, of development.

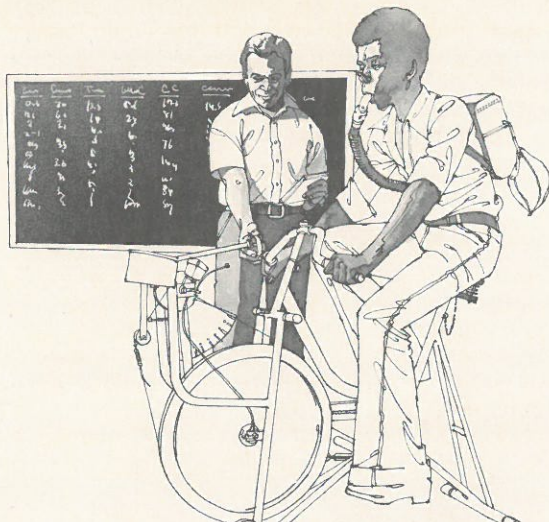
# WORLD HUNGER PROGRAMME

One out of every four human beings by some estimates—or about one billion people—exists today on a diet with nutritional deficiencies that affect health or work performance. The majority are children under the age of five. Should they survive the ravages of malnutrition in early childhood, they still face a lifetime hampered by retarded physical growth and lessened learning ability.

It is often assumed that the cause of hunger in the world is a tendency for population growth to exceed food supply. While it is true that the world population has doubled in the last half-century, and will add another billion by the end of the 1980s, *per capita* world food production has not decreased—and is unlikely to do so in the immediate future. The chief cause of hunger and malnutrition in today's world is **maldistribution of food**. Particularly in low-income groups—an ever-increasing proportion of the globe's population—more and more people cannot buy or produce as much food as they need to sustain health.

In the judgement of the experts who helped shape it, the World Hunger Programme would be able to make its most significant contribution by concentrating on the conservation, distribution, and consumption of food. The far greater resources of FAO and international agricultural institutions are already primarily focused on problems of agricultural production. The programme's approach is directed at helping institutions in developing countries to develop the personnel and scientific competence needed to deal with food and nutrition policy and planning.

During the year under review, an agreement was concluded with a new associated institution, the University of Ghana, Legon, bringing to nine the number of associated institutions in the programme. Negotiations for two more associated institutions in the Netherlands and Colombia are in progress. An exchange of letters with the National Food Research Institute, Tsukuba, Japan, resulted in an agreement for training UNU Fellows at this institute.



Accurate protein and energy standards are vitally important elements for food and nutrition policies in developing countries. But to be useful these standards should draw on data obtained from local people not, as in the past, on tests on healthy individuals in affluent nations. A World Hunger Programme network is gathering such data (as shown above), and has already published important findings on current knowledge and research needs, to increase understanding of dietary needs in developing countries.

Twenty-seven UNU Fellows and 10 Special Fellows\* started their training in associated institutions during the past year joining the 21 already on fellowships.

Research projects on human protein energy requirements in the tropics received University support in Thailand, Guatemala, Mexico, the Republic of Korea, Colombia, Chile and Jamaica. Work in this area was also being carried out in the US by a UNU Fellow from India as part of his training, and new research projects are being launched in Brazil, Chile, and the Philippines. Projects dealing with iron requirements received University support at associated institutions in Venezuela and Chile. Research on questions of food and nutrition policy planning was inaugurated in Chile and Colombia. New research on problems of post-harvest food conservation was initiated in Indonesia, supplementing the work already being done in this field as part of the training of UNU Fellows at associated institutions in India and Guatemala.

Eight technical meetings and workshops in which some 500 scientists participated were organized during the year. The programme staff, interregional co-ordinators, and consultants made site visits to institutions in more than 30 countries of Africa, Asia, Central and South America, and Eastern and Western Europe.

## Perspectives and Activities of the Sub-programmes

### FOOD AND NUTRITION POLICY AND PROGRAMME PLANNING

This predominant sub-programme incorporates the research and training experience developed in the other two sub-programmes—in post-harvest food conservation and human nutritional needs in the tropics—and is establishing its own specific research and training efforts. It is also the chief vehicle by which the World Hunger Programme is developing increasing interaction with the other two University programmes.

The sub-programme is concerned with understanding the factors responsible for hunger and malnutrition and the effects of alternative interventions, both direct and indirect, and intentional and unintentional. This requires the perspectives of many disciplines, since in all economic and political systems the factors that determine whether food needs are adequately met are multiple and complex.

In theory, the gap between effective demand for food and human food needs can be approached in many different

\* A category for shorter duration fellowships for study at associated institutions by senior personnel of similar institutions.



The World Hunger Programme has now given advanced training to nearly 100 UNU Fellows. Dr. Silvia Franzetti, an Argentinian physician, is a Fellow at the Institute of Nutrition of Central America and Panama in Guatemala, an associated institution, where she is doing research on the nutritional stresses of lactation among women in developing countries.

ways. For example, people can buy more food if prices are lowered by price controls, subsidies, decreased production costs, lower distribution costs, etc. The same result can be achieved by an increase in purchasing power through better employment and income generation, minimum wages, reduced taxes, subsidies and the like. For some families, increased home production or procurement can help close the gap. Each of these measures has disadvantages as well as advantages.

Nutritional deficiencies can sometimes be overcome, at least in part, by improving the nutritional value of foods. Examples of such improvements are the iodization of salt to prevent endemic goiter, vitamin A fortification of sugar or another appropriate food vehicle for the prevention of nutritional eye disease, and improving the iron value of food in different ways. For the poorest and most vulnerable individuals, free or greatly subsidized distribution of food may be introduced as a temporary measure while specific programmes to improve their economic situation are implemented. Measures to control infectious diseases can help close the gap by decreasing human food need. Because hunger is in large measure due to poor food choices and habits, nutrition education is a part of this sub-programme.

The sub-programme seeks to increase understanding of these factors and their interplay. Its research and training efforts involve a wide range of disciplines—economics, political science, anthropology, sociology, and systems analysis, along with the various nutritional, agricultural, and health sciences.

The initial focal point for training in this sub-programme is the International Food and Nutrition Policy Program (IFNP), a co-operative undertaking of two institutions in the US, the Massachusetts Institute of Technology (MIT) and Harvard University. IFNP, which became associated with the University in February 1978, draws on the resources of the MIT's Department of Nutrition and Food Science and Center for International Studies and the Harvard School of Public Health. Certain UNU Fellows now receiving interdisciplinary training at the MIT-Harvard consortium will go on to further field-level training in the application of planning and policy at the Nutrition Center of the Philippines. Advanced training of Fellows will also be conducted at associated institutions in Canada, Guatemala, and Ghana.

The sub-programme's first research grants were made this year. Two research projects are being supported at the Institute of Nutrition and Food Technology, an associated institution in Chile. One project has demonstrated distinct nutritional and health improvement for poor urban families who adopted an environmental sanitation package that includes safe water and sanitary toilets within the home. Another analysed the reasons for the decline in breast-feeding in Chile and proposed a series of measures to reverse this trend. A UNU Fellow now at MIT has the data from the national nutrition survey in Chile on computer tape and is carrying out a multifactorial analysis of the correlates of malnutrition in that country as a guide for policy-makers. A project in Colombia is identifying the relative contributions of the many factors responsible for malnutrition and is developing a model which allows for the selection and testing of specific interventions.

#### POST-HARVEST CONSERVATION OF FOOD

An estimated 20 to 40 per cent of cereal grains and over

50 per cent of fruits and vegetables in many tropical developing countries are lost after harvest because of rodents, insects, mould, spoilage, and other storage and handling losses. Reducing such losses through application of appropriate technology could effectively improve food supplies.

Since these losses are particularly serious for subsistence farmers and food-short rural areas, prevention of food losses is an important means of improving their nutritional health status. Yet the attention given to food production has not extended to food conservation until very recently, and this has been due, at least in part, to the stimulus of the World Hunger Programme.

The economically feasible prevention of such losses requires interpretation and dissemination of those indigenous practices that are effective in this regard, as well as the adaptation of appropriate modern technology to village conditions. For both, evaluative and adaptive research at the rural level is required. This must cover the handling, storage, processing, and transportation, as well as the distribution and ultimate use of food, and serve as the basis of interdisciplinary applied research and practical training. Families often feel helpless in the face of losses that could be readily prevented by the use of a combination of



A World Hunger Programme project on post-harvest food losses focuses on the needs of those most cruelly affected by such losses—the individual village farmer and his family in developing countries. Scientists at the Central Food Technological Research Institute in Mysore, India, an associated institution, have developed devices, which can be built from local material, such as the rat-proof grain silo shown at left.

indigenous methodologies and adaptation of modern techniques or materials.

The Central Food Technological Research Institute in Mysore, India, has been the main associated institution for research and advanced training efforts in this area to date. Scientists at the Institute have had 25 years of experience developing techniques to cope with India's own immense post-harvest losses. The Indian experience has proved to be of particular application for UNU Fellows from African countries.

UNU Fellows have also received training in post-harvest technologies at the Institute of Nutrition of Central America and Panama, an associated institution in Guatemala. Further training efforts are now being organized at two associated institutions in industrialized countries, the Tropical Products Institute in London, UK, and the Centre for Research in Nutrition at Laval University, Quebec, Canada. (The latter will primarily train Fellows from French-speaking countries.) A fellowship training programme is also being developed at the associated institution at the University of Ghana. During their period of training, all of the Fellows in this sub-

programme conduct research, and their findings help advance the over-all goals of the sub-programme.

During the past year, research grants were also made to institutions in Indonesia and Colombia. The Agricultural University in Indonesia is doing research on the modernization of traditional packaging technologies for grain storage, with emphasis on farm and village-level technologies. The Foundation for Higher Education in Colombia is doing research on the extent of that country's post-harvest food losses.

### NUTRITIONAL NEEDS AND THEIR FULFILMENT THROUGH LOCAL DIETS

Knowledge of nutritional requirements is essential for estimating the adequacy of food supplies and consumption, for developing sound nutritional education messages, and for planning food policies and nutrition interventions. Yet most studies of nutritional requirements have been carried out in the relatively privileged populations of a few industrialized countries. The requirements of the populations of developing countries, who live under conditions of frequent, acute and chronic infections and consume low-calorie diets of low nutrient density with factors which interfere with nutrient absorption, are extrapolations that have not been validated by evidence from studies of such populations. The University has established requirements for protein and energy and on means of improving the available iron in local diets.

Human dietary needs are conditioned by interaction of physical, biological, and social influences in the environment with individual genetic characteristics and physiological and pathological status. The perspectives of many disciplines are needed to consider the requirements for biological survival as well as those for better learning and behaviour, desirable social and economic activity, and relative freedom from disease.

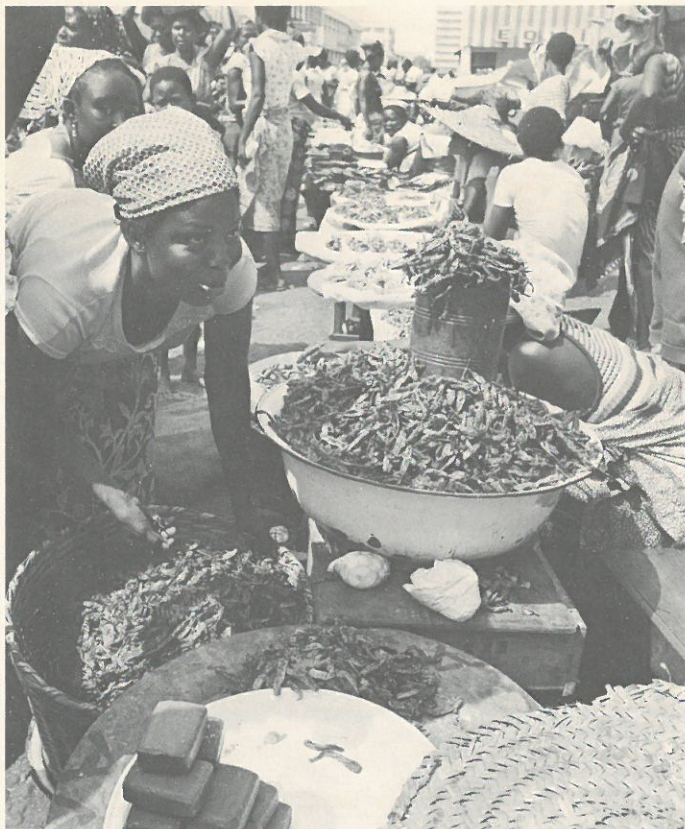
The University's activities in this sub-programme have centred initially on the Institute of Nutrition of Central America and Panama in Guatemala, which has helped to co-ordinate a multi-nation research effort, including its own research programmes, and also provided training to Fellows from Latin America, Africa, and Asia. As in the case of the sub-programme on post-harvest food losses, the research interests of the UNU Fellows at this Institute are tailored to their own particular needs and also to serve the over-all objectives of the sub-programme. Fellows are also receiving training in this area at the International Food and Nutrition Policy Program at the MIT-Harvard consortium.

The work at the Institute in Guatemala has been enlarged by the creation of an extensive research network to obtain information on protein-energy requirements of populations living in a variety of developing countries and the capacity of their local diets to meet them. To this end, projects have received University support in Brazil, Chile, Colombia, Guatemala, Jamaica, the Republic of Korea, and Thailand. These studies are providing the best and most comprehensive information to date of nutritional needs of non-Caucasian populations and on groups living under unfavourable environmental conditions. They are demonstrating that the frequent, acute and chronic gastro-intestinal infections, including those caused by parasites, experienced by these populations lead to changes in the gastro-intestinal tract that reduce the efficiency of absorption of both dietary

energy and protein. The acute infections lead also to increased protein losses. The diets for some young children in developing countries are so high in water and fibre relative to protein and energy density that the children cannot eat enough of the diet for satisfactory nutrition. The study in the Republic of Korea shows a distinct improvement in intestinal absorption following deworming. The earliest results of the study are included in a supplement to the programme's quarterly publication, *Food and Nutrition Bulletin*, Vol. 1, No. 3, and these will be further summarized in a meeting of the principal investigators scheduled for early 1980. Investigators at Tokushima University in Japan and the Massachusetts Institute of Technology in the US are co-operating in these studies at no cost to the United Nations University.

Also in this area of human nutritional needs, University-supported research in Venezuela and Chile, complemented by studies in Guatemala supported by other sources, is determining the relative availability of iron from different dietary sources and developing means of preventing iron deficiency through fortification of staple foods with biologically available and palatable forms of iron. This work is important because iron deficiency contributes to reduced physical work capacity.

Close collaboration with WHO and FAO is maintained through participation of officials of these agencies in Advisory Committee meetings. The programme is represented on the ACC Sub-Committee on Nutrition—the



The World Hunger Programme project on food and nutrition objectives in national planning and development includes study by UNU Fellows of local food distribution systems which are often centred around open-air markets such as that shown above in Accra, Ghana. This project links institutions in 9 countries.



Understanding the factors responsible for hunger and malnutrition and the possible effects of alternative interventions is important for the development of appropriate food and nutrition policies. A research team from the University of Ghana, an associated institution, gathering information on local diets in a village outside Legon.

body established by the United Nations Administrative Committee on Co-ordination to harmonize all nutrition activities in the United Nations system and to initiate appropriate new activities directed towards reducing global malnutrition. The ACC Sub-Committee includes representatives of WHO, FAO, UNICEF, WEP, IFAD, UNDP, UNEP WFC, World Bank, ILO, UNESCO, UN, and UNU.

#### Associated Institutions

The programme now has a total of nine associated institutions:

- Central Food Technological Research Institute, Mysore, India
- Centre for Research in Nutrition, Laval University, Quebec, Canada
- Department of Nutrition and Food Science, University of Ghana, Legon, Ghana
- Institute of Nutrition of Central America and Panama, Guatemala City, Guatemala
- Institute of Nutrition and Food Technology, University of Chile, Santiago, Chile
- International Food and Nutrition Policy Program, Massachusetts Institute of Technology and the Harvard School of Public Health, Cambridge, Massachusetts, USA
- Nutrition Center of the Philippines, Makati, Philippines

- Tropical Products Institute, London, UK
- Venezuelan Institute for Scientific Research, Caracas, Venezuela
- The programme also includes a training unit based at the National Food Research Institute, Tsukuba, Japan.

Associations are being explored with the following institutions:

The Institute for Animal Nutrition Research, Wageningen, the Netherlands, will co-ordinate the work being carried out by the joint World Hunger and Natural Resources programmes on the bioconversion of organic residues for rural communities and the advanced training and applied research directly relevant to it.

The University del Valle, Colombia, will undertake a comprehensive interrelated programme of research projects in all three sub-programme areas. Initially, these will be studies of post-harvest food losses, nutrition policies, nutrition intervention programmes, protein-energy requirements, and the stimulus of small food production systems. It is anticipated that training of UNU Fellows will begin in the second year of association.

Negotiations are also in progress for two additional

associations: the National Institute of Nutrition of Mahidol University, Thailand, and the University College of the West Indies in Jamaica and Trinidad. Active collaboration has been established between the associated institution at Laval University in Canada and the Institute of Food Technology in Senegal through promotion of joint research projects which has tended to increase the capacity and contributions of the latter institution.

### Fellowships

During 1978—1979, 37 UNU fellowships, including 10 Special fellowships, were awarded for training at associated institutions, bringing the total awarded to date to 87. Thirty-one Fellows and the 10 Special Fellows completed training and returned to their home institutions. Plans call for 15 more Fellows to start training in the second half of 1979.

The countries of origin of Fellows are shown in the following table.

Fellowships awarded during the period  
July 1978 — June 1979

Country	Male	Female
Argentina		2
Bangladesh	1	
* Chile	1	
Costa Rica	2	
Colombia		1
Ecuador	1	
* Ecuador	2	
Ghana	1	
India	1	
* India	1	
Jordan	1	
* Kenya	1	
Liberia	1	
* Libyan Arab Jamahiriya	1	
Mexico	2	
Morocco		1
Nepal	2	
Nigeria	1	
* Nigeria	2	
Pakistan	1	
Peru		1
Philippines	1	2
Saudi Arabia	1	
Sri Lanka	1	
* Thailand	1	
Tunisia	1	
Turkey	1	
United States of America	1	
* Zambia	1	
Total	30	7

\*Special Fellows

### Third Advisory Committee Meeting

At its third meeting, held in Tokyo in January 1979, the Programme Advisory Committee recommended:

**Assistance to countries at a very low level of development.** The University must find ways of assisting the development programmes of these countries. It can do so without abandoning its existing policies and strategies by introducing flexibility in its approaches to these countries. The Committee recommended:

- (i) drawing the attention of other agencies to the basic

needs for development of institutions to train lower-level professionals and to assist in basic level research training;

- (ii) making available UNU management level fellowships to carefully selected government officials and scientists with decision-making powers or leadership potential;
- (iii) providing a number of fellowships for training local professionals in some selected disciplines with a view to assisting with the creation of "a critical scientific mass" within the country of the institution, which will help stimulate further development in the fields of research and training; and
- (iv) giving particular attention to the needs of French-speaking Africa where the creation of an "incorporated" institution may need to be considered.

**Women and post-harvest food conservation.** It was recommended that the training of women in post-harvest preservation and processing of foods at the village level be recognized as deserving specific attention in its own right. It was recommended that the World Hunger and Human and Social Development programmes should undertake a joint programme of work on the role of women in post-harvest food conservation to help define the problems, to identify the research studies to be undertaken, and to take necessary steps to implement the research projects on the following topics:

- (i) post-harvest food technologies traditionally used by women, analysed for their usefulness in terms of economy, time use, food value, and potential for improvements;
- (ii) technologies suggested for village-level use in the light of their usefulness for women under prevailing conditions; and
- (iii) a review of the attention presently given to food technologies useful to women at the various associated institutions of the University, with possible policy suggestions.

### MEETINGS AND WORKSHOPS

- UNU symposium on Nutritional Impact of Food Conservation and Processing (held as part of the International Congress of Nutrition), Rio de Janeiro, Brazil, August 1978
- UNU symposium on Potential of Post-Harvest Food Conservation and Processing for Alleviating World Hunger (held as part of the International Congress of Food Science and Technology), Kyoto, Japan, September 1978
- Regional workshop on the Interfaces of Agriculture, Food Science and Nutrition (fourth in the series), Guatemala City, Guatemala, November 1978
- Joint WHP-NRP international conference on the State-of-the-Art of Bioconversion of Organic Residues for Rural Communities, followed by a two-day task force meeting, Guatemala City, Guatemala, November 1978
- Seminar on Food and Nutrition Constraints in the Developing World—the Perspectives of our Roles and Contributions, Tokyo, Japan, January 1979
- WHP-HSDP joint workshop on Goals, Processes, and Indicators of Food and Nutrition Policy, MIT, Cambridge, Massachusetts, USA, March 1979
- Integrated Nutrition and Family Planning workshop Lomé, Togo, May 1979
- Joint WHP-NRP task force on the State-of-the-Art of Bioconversion of Organic Residues for Rural Communities, Stockholm, Sweden, June 1979

# HUMAN AND SOCIAL DEVELOPMENT PROGRAMME

The Human and Social Development Programme is attempting to reexamine the conventional development wisdom of the recent past which tended to equate economic growth with improvement in the over-all quality of human life. This has often proved not to be the case, most notably in the developing countries. In particular, the rural villagers of the third world, who comprise the bulk of the population, have realized few benefits from national economic growth. If anything, gains elsewhere have made their current plight stand out more sharply.

Thus there is now widespread realization that new development concepts need to be evolved and analysed dispassionately in order to understand better the complex interplay of social, cultural, economic, and political forces that affect the development process on a world-wide basis.

The basic assumptions underlying the work of the Human and Social Development Programme are the following:

(a) the pressing global problems of human survival, development, and welfare are closely interrelated, and therefore an approach which treats gaps in knowledge separately is unsatisfactory;

(b) the solution of world-wide problems depends not only on technical knowledge, but also on a clear understanding of the causal relationships among the socio-cultural, economic, and political factors determining the nature of the problems;

(c) the major task of the academic and scientific community is to identify the key determining factors of the problems; and

(d) the international academic and scientific community is composed of a variety of schools of thought which propose different theories and models of pressing global problems and ways of solving them, based on various disciplinary backgrounds and cultural traditions.

It is a basic tenet of the programme that the intellectual challenge posed by pressing global problems can be met only if representatives of different schools of thought, belonging to different disciplines and cultural traditions, can interact in sustained discourse. It is stimulating and encouraging such discourse at various levels: between

scholars espousing different cultural and philosophical approaches; and between different regional and national experiences.

This forum function of the programme is performed in close liaison with United Nations research organizations and with international or regional organizations (such as the Consejo Latino Americano de Ciencias Sociales and the Council for the Development of Economic and Social Research in Africa). Thus the multidisciplinary scholarly examination of problems that flourishes in a university atmosphere is always kept in close touch with the world realities reflected in the United Nations.

During the period under review—the third year of operation for the Human and Social Development Programme—the nature and role of the programme became more clearly delineated. There was continuing progress in refining the concepts underlying the various activities, in evolving new research methodologies, and in building networks of research institutions around the world. The programme now has contractual arrangements with some 93 research units around the world and with the following associated institutions:

- El Colegio de Mexico, Mexico City, Mexico
- Institute of Developing Economies, Tokyo, Japan
- Institute of Development Studies, Geneva, Switzerland
- Marga Institute, Colombo, Sri Lanka
- The Latin American Faculty of Social Sciences, Mexico City, Mexico

## Perspectives and Activities of the Sub-programmes

The work of the two sub-programmes, Problems of Development, and Technology and Development, is designed to be complementary and mutually reinforcing. The first sub-programme is a long-term research effort involving social scientists and other scholars around the world and seeks to develop new insights about the nature of development problems. The second is directed at the store of practical knowledge that has built up at the village level over the centuries. It seeks to learn more about how local technologies are developed, how they should be linked with the modern sector, and how transfer of such technologies



The Human and Social Development Programme is seeking to reexamine the conventional development wisdom equating economic growth with improvement in the quality of human life. Rural villagers of the third world have realized few benefits from national economic growth. If anything, the gains elsewhere make their plight stand out more sharply.

could help meet national, regional, and international needs.

The major components (and research units) of the two sub-programmes are the following projects:

#### **Problems of Development**

Goals, processes, and indicators of development (25 research units);

Socio-cultural development alternatives in a changing world (20 research units);

Human rights, peace, and international law in the context of development (planning stage);

Technical co-operation among developing countries (planning stage).

#### **Technology and Development**

Sharing of traditional technology (7 research units);

Research and development systems in rural settings (5 research units);

Technology transfer, transformation, and development: the Japanese experience (36 research units).

### **PROBLEMS OF DEVELOPMENT**

#### **Goals, Processes, and Indicators of Development**

This five-year research project, now in its third year, is attempting to shed new light on the complex and troubling question of why development strategies of the last two decades have produced such disappointing results. While providing a forum for the expression of different political and economic philosophies—from all parts of the world—a common thread of its research is a concern with human needs, both material and non-material.

The project stresses the importance of seeing goals, processes, and indicators of human development in their relations to each other, and not as separate entities. Much previous research on development has tended to detach indicators from the other two components and focus on what is available and measurable. Similarly, goals of development have often been set which ignore practical considerations of those processes that have actually worked effectively and those that have produced disappointing results.

The project is co-ordinated through the Institute of Development Studies of the University of Geneva, which was established in 1961 as a research centre of general third world issues. The association agreement between the United Nations University and the Institute became operative in March 1978.

During the past year, the 25 research units affiliated with the project developed their initial activities on the several sub-themes of the study, which include: (a) visions of desirable worlds; (b) visions of desirable societies; (c) alternative ways of life; (d) basic needs; (e) food and nutrition policy; and (f) forms of presentation. The results of these initial activities were presented and discussed at the project meeting held in Geneva in October 1978. Of the 72 papers presented at the meeting, 40 are now in preparation for publication.

Besides the activities of the research units, the following meetings on selected themes were organized in co-operation with international research bodies:

- Forms of Presentation, Geneva, Switzerland, February, 1979;
- Expansion and Exploitation Processes/Autonomy and Liberation Processes, Starnberg, Federal Republic of Germany, March;
- Alternative Strategies and Scenarios, Geneva, Switzerland, March;
- Rights, Geneva, Switzerland, March;
- Alternative Ways of Life, Sicily, Italy, April;

- Networks, Paris, France, May;
- Socio-cultural Alternatives and Social Cosmology, Paris, France, May;
- Visions of Desirable Societies, Mexico City, Mexico, May;
- Energy Study Group, Crottorfschloss, Federal Republic of Germany, June;
- Needs, Berlin (West)\*, June;
- Visions of Desirable Worlds, Bucharest, Romania, June.

\* The interests of Berlin (West) are represented in the United Nations by the Federal Republic of Germany

Through its various activities, the project is proving to be a forum for valuable and intensive interaction between different schools of intellectual thought about development. Concepts have been refined, and a deepening understanding of the processes of development is in evidence. Linkages have been established between researchers and institutions in the industrialized and developing countries. As the project moves ahead, its output will include teaching and education and development action, apart from the research itself.

#### **Socio-cultural Development Alternatives in a Changing World**

This project focuses on the cultural and civilizational dimensions of development. Co-ordinated from the National Centre of Scientific Research in Paris, the project was in its first year of operation during 1978—1979. The year was devoted essentially to launching its programme activities side by side with the organization of the project network and publications planning.

The project is conducting two types of scientific meetings simultaneously:

The first is a series of **regional symposia** on the theme "Endogenous Intellectual Creativity" in which leading exponents of major intellectual schools of thought and action participate. The symposia are being held in each of the major cultural areas of the world—East, South-East, and South-West Asia, Europe, the Arab region, sub-Saharan Africa, Latin America, North America, and Oceania. At the symposia, position papers prepared by experts representing the various elements within a cultural area are presented and discussed. In addition to historians, philosophers, social scientists, and other scholars from a given cultural area, international participants also attend the symposia and take part in the discussions. The findings of each regional symposium are carried over and discussed at subsequent ones. The series aims at evolving a methodology for meaningful comparison between different cultures which could lead to identification of universally valid findings and orientations.

The series on Endogenous Intellectual Creativity was launched at a symposium in Kyoto, Japan, in November 1978 (see photoright), attended by 66 participants from 14 Asian countries and 8 other nations. Four dimensions of endogenous intellectual activity in Asia were analysed—philosophical approaches, historical testimony, social roots, and the emerging patterns of a more human and equitable international order.

A second symposium brought Latin American scholars together at Mexico City in April 1979. The discussions provided a deepening diversification and enrichment of the findings of the Kyoto symposium.

The second is a series of **international seminars** on the theme "The World in Transformation" to examine the major component areas of a new international order. These will include: science and technology; economy and society;



culture and thought; religion and philosophy; history and international relations; and civilizational prospective. This series aims at establishing a systematic fund for thought and action by leading experts in the field, open equally to all schools of thought. The series will start in October 1979 at the University of Belgrade where 25 to 30 leading experts will focus on science and technology. The other component areas will be examined in subsequent seminars.

**Project network.** The project network, during its first phase, was organized around 13 research institutions in different countries, which to date has grown to 20. The network organization will involve 25 research institutions from all parts of the world.

Research grants are being allocated for joint research activities dealing with different sub-themes and scientific areas of the project. Each will involve organization of a yearly workshop by a research unit, resulting in one research report as well as other papers for publication in the project series. At the same time, a limited number of research reports by leading individual experts are being commissioned.

**Additional sub-projects.** Following the meeting of the project's advisory board in Kyoto in November, two new sub-projects are being initiated, one concerned with families and societies, the other with new developments in religious thought.

**Publications.** Four types of publications are now being actively planned:

**Books.** There will be a series of two volumes published for each of the regional symposia and international seminars—the first reporting the proceedings, the second a volume of closely edited discussions. It is hoped that a paperback version of the second volume will be circulated to a wider public. Other books are expected from the workshops.

**Research reports.** It is expected that about six

research reports will be ready by autumn 1979. These will be the first in a series of booklets of about 100 pages each.

**Occasional papers.** Some 8 to 10 will be published by the end of 1979, beginning with reports on the Kyoto and Mexico City symposia.

**Readers.** Preparations are proceeding on a series of readers on creative new thought in the hitherto "hidden" parts of the world (basically Asia, Africa, and Latin America) which will be linked comparatively to new intellectual trends in Europe and North America.

**Planning for 1980.** Two regional symposia are now being organized for 1980—one at the Kuwait University in February dealing with the Arab region, a second in Vienna in the autumn dealing with Europe. The second international seminar, devoted to "Economy and Society," will be held at the Central University of Venezuela, Caracas, in spring 1980. A continuing series of workshops is also planned, as are further publications.

**Human Rights, Peace, and International Law in the Context of Development**

This project conceives of human rights in a broad sense. They are related to the larger context of development and the material and non-material needs of people and are not limited to political rights, civil liberties, and relations to states.

During the year under review, the project organized a colloquium on the right to health and healthy environment in co-operation with the Academy of International Law at the Hague. A volume reporting the discussions at the colloquium, **The Right to Health as a Human Right**, was co-published in April 1979; it is being distributed widely to law faculty libraries around the world. A colloquium on the Right to Development at the international level was also held at the Hague in October 1979.



## TECHNOLOGY AND DEVELOPMENT

### Sharing of Traditional Technology

This project focuses on the traditional technologies in 23 villages in eight Asian countries. It seeks to identify and evaluate those technologies which might be transformed, through modern scientific analysis, into appropriate technologies which could be shared and thereby play an important role in improving the immediate living standards of the rural poor.

The project is co-ordinated through the Marga Institute in Sri Lanka. Established in 1972, the Institute has particular interest in developing issues in Sri Lanka. It also maintains an effective network of linkages with scholars interested in development elsewhere in Asia and the rest of the world.

During the year, in-depth studies in 16 of the 23 villages were completed. Researchers continued to live in these villages and have successfully established a good rapport with the villagers. They have formed village-level networks of governmental and non-governmental institutions and individuals and promoted discussions between these groups and the villagers. Village-level seminars have already been held, as well as a few national seminars, and many researchers have been able to visit each other and familiarize themselves with ongoing field activities in the other villages. Specific technologies have been identified and recorded, and technical panels have been set up at the

national level for further evaluation of these technologies.

Two progress review meetings were held during the year, in Thailand in November and in Indonesia in April, which contributed significantly to the conceptual and methodological evolutions of the project. Such meetings are vital to the co-ordination of the widely distributed research units in countries with different administrative and academic traditions.

The village studies are continuing to concentrate on technologies related to some of the most vulnerable clusters of activity and management—interactions of the infant and mother, maintenance of the human body, the efficient management of shelter, water, land and climate, and the processing and preservation of food. It has also been decided to select certain specific items common to all the villages and identify their varied uses. Those chosen were bamboo, banana trees, cattle dung, and rain-water.

In the research to date, it has been noted that the traditional technologies identified often appear to be of minimal hard economic value to the users. Although at first this would seem to be detrimental to its value as an instrument of development, closer evaluation shows that the value of some traditional technologies must not be judged on economic criteria alone. The value of what appear to be marginally valuable technologies are thus being looked at afresh. An example would be the non-medical value of a massage for a child which transmits intimacy, warmth, and

### Research Units of the Human and Social Development Programme are based at the institutions listed below

#### Project on Goals, Processes, and Indicators of Development

- Institute of Development Studies, Geneva, Switzerland (co-ordinating institution)
- African Institute for Economic Development and Planning, Dakar, Senegal
- Bariloche Foundation, San Carlos de Bariloche, Argentina
- Bureau of Resource Assessment and Land Use Planning, University of Dar-es-Salaam, Dar-es-Salaam, Tanzania
- Centre for Policy Research, University of Science Malaysia, Penang, Malaysia
- Centre for the Study of Developing Societies, New Delhi, India
- Chair in Conflict and Peace Research, University of Oslo, Oslo, Norway
- Committee "Poland Year 2000," Polish Academy of Science, Warsaw, Poland
- Department of Extension Studies, University of Papua New Guinea, Port Moresby, Papua New Guinea
- Department of Sociology, University of Auckland, Auckland, New Zealand
- Division of Systems Studies, University of Bucharest, Bucharest, Romania
- El Colegio de Mexico, Mexico City, Mexico
- GAMMA, University of Montreal, Montreal, Canada
- Institute for Peace Science, Hiroshima University, Hiroshima, Japan
- Institute of International Relations, University of the West Indies, Kingston, Jamaica
- International Institute for Environment and Society, Science Centre Berlin, Berlin (West)\*
- Marga Institute, Colombo, Sri Lanka
- Mershon Center, Ohio State University, Columbus, Ohio, USA
- Peace Research Institute, Sweden, Göteborg, Sweden
- Project Group "Development and Underdevelopment/World Economy," Max Planck Institute, Starnberg, Federal Republic of Germany

- Science Policy Research Unit, University of Sussex, Brighton, UK
- Society for International Development, Rome, Italy
- Union of International Associations, Brussels, Belgium
- United Nations Institute for Training and Research (UNITAR), Geneva, Switzerland
- World Future Studies Federation, Rome, Italy

#### Project on Socio-Cultural Development Alternatives in a Changing World

- National Centre of Scientific Research, Paris, France (co-ordinating institution)
- Caribbean Development and Co-operation Committee, Port of Spain, Trinidad and Tobago
- Centre for East Asian Studies, McGill University, Montreal, Canada
- Centre for Economic and Social Research and Studies, University of Tunis, Tunisia
- Centre for Political Studies, School of Social Sciences, Jawaharlal Nehru University, New Delhi, India
- Centre for the Study of the Practices and Representations of Socio-Economic Changes, University of Grenoble, Grenoble, France
- Department of Bengali, University of Chittagong, Chittagong, Bangladesh
- Department of Political and Social Sciences, Complutensian University of Madrid, Madrid, Spain
- Department of Social Anthropology, University of Cambridge, Cambridge, UK
- Department of Sociology, University of Auckland, Auckland, New Zealand
- Department of Sociology, University of Ibadan, Ibadan, Nigeria
- East Asian History of Science Library, University of Cambridge, Cambridge, UK
- Faculty of Social Sciences, University of Warsaw, Warsaw, Poland
- Fernand Braudel Center for the Study of Economies, Historical Systems and Civilizations, State University of New York at Binghamton, Binghamton, USA
- Institute for Peace Science, Hiroshima University, Hiroshima, Japan
- Institute of Arab Research and Studies, Cairo, Egypt

# Report

OF THE COUNCIL OF THE UNITED NATIONS UNIVERSITY  
1978—1979

The Council reports annually to the General Assembly, the Economic and Social Council and the Executive Board of UNESCO, through the Secretary-General of the United Nations and the Director-General of UNESCO, respectively.



The Council of the United Nations University held both its eleventh and twelfth sessions in Tokyo, from 4 to 8 December 1978 and from 25 to 29 June 1979, respectively. During 1978—1979, the Council met for a total of 10 days to consider the University's programmes, problems, and progress. In addition, the Council's Nominating Committee for a new Rector, headed by the Chairman of the Council, met several times in Tokyo and also in Geneva, while its Chairman and other members made extensive consultations on possible candidates, both personally and in writing.

Following acceptance of the resignation of Dr. Marcel Roche as Chairman of the Council, the Council, at its eleventh session in December 1978, unanimously elected Dr. Ines Wesley Tanaskovic as the new Chairman, and her term as Chairman began at the end of that session. During the same session the Council also unanimously elected Dr. Estefania Aldaba-Lim and Dr. Carlos Chagas as Vice-Chairmen of the Council.

At its session in June 1979, the Council received, examined, and discussed the report of the Rector.

The Council draws attention to the substantial progress of the University during the past year\*—expansion of its activities, increasing interaction between its three programmes, and a welcome but still inadequate strengthening of its financial support through the Endowment Fund.

The Council welcomes the following signs of expansion of activities and of increasing interaction between its three programmes—World Hunger, Human and Social Development, and the Use and Management of Natural Resources:

(a) The University signed association agreements with 9 institutions to conduct advanced training and research, bringing the total number of associated institutions to 23. Of these, 15 are in developing countries and 8 in industrialized countries.

(b) Some 1,400 scholars, scientists, and policy-makers participated in various types of scientific and scholarly meetings organized by the University, including 49 programme meetings held in 26 countries, and the final two consultative meetings, held at Accra and Nairobi in March, attended by 150 academic and government leaders from 22 African nations. These consultative meetings end the series of 14 such meetings initiated in 1976 to acquaint the world-wide academic community with the nature and initial programmes of the University.

(c) Forty-four UNU Fellows completed their training during the year and are now working in home institutions in developing countries. They represent the University's contribution towards the realization of its objective of strengthening experience and knowledge in the developing world. Almost half the UNU fellowships granted over the last

three years began during the year under review.

(d) Eighteen networks are now in operation: 4 in World Hunger, 5 in Human and Social Development, and 9 new ones in Natural Resources. They link together scientists and scholars working on these projects in some 60 countries and collaborating on problems that transcend national boundaries.

(e) A major advance in programme interaction was achieved through the launching of joint activities among the University's three programmes: (i) an assessment of the field of biomass conversion, at a workshop of the World Hunger and Natural Resources programmes held in Guatemala in November 1978; (ii) an examination of the problem of identifying alternative goals, processes, and indicators of food and nutrition policy by the World Hunger and the Human and Social Development programmes, at a joint workshop held at the Massachusetts Institute of Technology, Cambridge, Massachusetts, USA, in March 1979; (iii) research and training on solar food conservation systems for rural communities by the World Hunger and the Natural Resources programmes; and (iv) research into resource systems and traditional technology by the Human and Social Development and Natural Resources programmes. The Council attaches the utmost importance to this interaction at the level of particular projects.

(f) The University launched two periodicals which have been widely circulated—*Food and Nutrition Bulletin*, published quarterly, and *ASSET (Abstracts of Selected Solar Energy Technology)* published monthly.

(g) Thirty publications have appeared, designed to inform scientists and scholars about the University's programmes. The Council noted in particular the important first technical report of the World Hunger Programme, **Protein-Energy Requirements under Conditions Prevailing in Developing Countries: Current Knowledge and Research Needs**, and the first of a series of publications on the Japanese experience of technology transfer.

The Council is greatly encouraged by the continuing financial support of the Government of Japan, the total contribution of which now amounts to US\$80 million, and by the broadening of the base of the University's Endowment Fund by the pledge from the United Kingdom of £5 million (approximately US\$9.8 million), the pledge from the Federal Republic of Germany of DM 8 million (approximately US\$4.3 million), and the pledge from Thailand of US\$0.5 million. During the past year, 18 other countries made annual pledges or contributions. Altogether, 28 Governments have now pledged or contributed a total of US\$141.9 million to the Endowment and operating funds of the University. At the same time, the Council emphasizes strongly that a further strengthening of financial support is essential if the University is adequately to fulfil its objectives.

\*Information in the Report of the Council has been updated through 1 November 1979

The Council received an oral report from the Rector on his 12-day visit to the People's Republic of China in May 1979, at the invitation of the Chinese Academy of Social Sciences in Beijing. The visit reflected the growing interest of the People's Republic of China and the scientific and academic communities of that country in the University's work. The Vice-Rectors accompanied the Rector on the visit.

The Council reaffirms its confidence in the University's basic approaches: (a) focusing its programmes on aspects of major world problems that can be usefully examined through collaborative work by scientists and scholars from many parts of the world; (b) combining knowledge from many disciplines in its efforts to find practical solutions to specific global problems; and (c) associating itself with other international institutions and organizations in the fields of hunger, development, and natural resources.

It believes that further action is still necessary, however, to ensure that the University enhances the distinctiveness of its basic approaches through combining the analysis of problems, the dissemination of knowledge, training, and effective action at the grass roots level. It will consider such further action at its next general session.

As was stated in the previous report of the Council, the fact the University has been in existence for only a short time does not permit a full assessment of the success of its three programmes and most of the projects within them. The Council agrees, however, that it is time to reflect on medium-term proposals for the future development of the University, taking into account the objectives of the University as laid down in the Charter and possible options depending on the level of income. The Council proposes to examine this subject further at its fourteenth session and has asked for relevant papers to be prepared.

The Council considered an important report by the Rector on relationships between the programmes of the University, noting their common assumptions and characteristics, and the principles underlying United Nations policies, as set out in the Charter of the United Nations, three documents on universal human rights, the Final Document of the Tenth Special Session of the General Assembly, and four Assembly resolutions on establishing a new international economic order. It noted the programme implications of the Rector's report in relation to the experience of current programmes and the formulation of possible future programmes. It will consider them more fully in the light of a more extended report to be presented to its next session.

The Council directs attention to the significance of the work carried out in its three programmes during the past year, noting that they are at different stages of development and that each programme has devised different methods of operation to suit its particular interests and needs.

#### **World Hunger Programme**

This programme first became operational in 1976, and by June 1979 the number of associated institutions had increased to nine. An agreement was made with the National Food Research Institute in Japan for training scholars, and agreements are ready to be concluded with institutions in Colombia and Holland.

Nearly 95 UNU Fellows have now been selected and over 40 Fellows and 30 Management Fellows have completed their fellowship training. Research projects concerning food and nutrition policy, post-harvest food conservation, and human nutritional requirements in developing countries are supported in Brazil, Chile, Colombia, Guatemala, India, Indonesia, the Republic of Korea, Mexico, the Philippines, Thailand, and Venezuela.

Close co-operation has continued with FAO, WHO, UNESCO and UNICEF, and agreements of co-operation with the United Nations Research Institute for Social Development (UNRISD) and the International Food Policy Institute are in process. The first three issues of the World Hunger Programme's *Food and Nutrition Bulletin* have been well

received.

The first technical report of the programme, **Protein-Energy Requirements**, as mentioned above, has been distributed.

A fourth workshop on "Interfaces of Food and Nutrition with Agriculture" was held from 6 to 10 November 1978 at Guatemala City, Guatemala, and a workshop on "Nutrition and Fertility" was held from 7 to 12 May at Lome, Togo. Arrangements have been made for selected committees of the International Union for Nutritional Sciences and the International Union of Food Science and Technology to carry out specific activities in pursuit of the goals of the World Hunger Programme.

#### **Human and Social Development Programme**

The Human and Social Development Programme, in its third year of operation, is broadly organized into two main sub-programmes: Problems of Development and Technology for Development. The programmes depend upon the creation of a critical forum where different schools of thought interact in order to analyse the economic, social, political, and cultural forces that affect the development process and to deepen the dialogue on alternative approaches to development.

Work has continued on the four initial research projects and three new projects, ranging from detailed studies at the village level to global analysis. In addition, studies have been carried out on the social and cultural consequences of the transfer of technology in Japan.

Eight thematic workshops and two regional symposia have been held in co-operation with international, regional, and national academic bodies, and more than 200 pre-publication research notes and papers have been presented and discussed by the research units in the different networks. During the same period, consultation and co-operation with different United Nations agencies, especially UNESCO, UNITAR and UNRISD, have enriched the programme's development and harmonized it with the work of those agencies.

#### **Programme on the Use and Management of Natural Resources**

The Natural Resources Programme was only effectively established during the period under review: it is wide-ranging in its scope and geographical range and concerns the ecological basis for rural development in the humid tropics, the assessment of the application of knowledge to arid lands, and energy for rural communities.

From the time of the inauguration of the Programme in 1977 to the starting date of this annual report (1 July 1978), the main task has essentially been to identify possible projects within these large fields and to explore opportunities in order to determine which problems and subjects should be considered and where research and training activities could most effectively be carried out.

In the year under review, the number of associated institutions increased from one to nine, six of which held scientific workshops. An important conference on energy alternatives was co-sponsored by the University from 9 to 12 January 1979 and held at the East-West Center in Honolulu, Hawaii, USA.

The fellowship programme is well advanced, and exploratory missions have been carried out to over 30 different countries by the programme staff or consultants. Ten research and training units have been established, and 12 more are in the planning stage. Six monthly issues of *ASSET* have been published and circulated to some 200 institutions.

At every stage in the planning and execution of projects the Natural Resources Programme has given careful attention to other international programmes in order to avoid duplication of effort. It has worked in co-operation with UNESCO, FAO, UNDP, UNEP and other bodies, including the International Geographical Union and Scientific Committee on Problems of the Environment.

The Council welcomes the increased attention paid during the year to the interaction of these three programmes, recognizing that, unless there is linkage and interaction at every level—including the local level of action, the real problems of development cannot be tackled effectively. Combinations of insights and techniques are necessary.

The Council is encouraged by the increasing impact of the University's intensified efforts to strengthen world-wide awareness and understanding of the distinctive role of the University among opinion-formers and policy-makers. It believes, however, that a continuing effort is necessary to publicize the work of the University and make known the increasing volume of support it is receiving. In financial terms, approximately US\$28 million was pledged or contributed in 1978—1979 as compared with US\$16 million in 1977—1978, and in the light of its fund-raising experience the Council discussed and clarified its strategies for future fund-raising in different parts of the world.

The Council believes that the University has now reached a level that makes it possible, with the addition of only a few more administrative personnel, to continue extending its programme activities around the world and to initiate new programmes if adequate funds become available. The demand for further programmes, particularly in the developing world, has been pressed at such conferences as the consultative meetings held at Accra and Nairobi in March 1979.

The Council approved a number of guidelines for its future publishing arrangements, particularly in the field of scholarly publication. It reaffirmed its policy of relying as much as possible on existing scholarly and other publication outlets.

The Council gave careful consideration to General Assembly resolution 33/109 in which the Assembly requested the Secretary-General to transmit the text of a proposal of the President of Costa Rica for the establishment of a University for Peace and Assembly resolution 33/109 to the 107th session of the Executive Board of UNESCO. It welcomed a delegation from Costa Rica, led by the Vice-President, who explained the Costa Rican initiative. A statement was prepared by the Council.

The Council considered the most effective mode and scale of participation by the UN University in the important United Nations Conference on Science and Technology for Development to be held in Vienna during the summer of 1979. It underlined the need for the University to make a distinctive contribution not only to the preceding colloquium, but to the work of the main Conference.

During a private session, the Council received a report from the Committee which it had appointed to prepare nominations for the position of Rector. It decided to hold a supplementary session (the thirteenth session) in October to complete its consideration of this subject and its fourteenth session in December 1979.

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## Council Members

### Appointed Members

Dr. (Mrs.) Ines Wesley Tanaskovic, UNESCO National Commission of Yugoslavia and Professor of Informatics, Medical Academy, Belgrade, Yugoslavia (Chairman of the Council)

Dr. Jacob Festus Ade-Ajayi, former Vice-Chancellor, University of Lagos, Lagos, Nigeria (former Chairman of the Council, 1976—1977)

Dr. (Mrs.) Estefania Aldaba-Lim, Special Representative for the International Year of the Child, UNICEF, New York, USA; former Vice-President, Philippine Women's University (Vice-Chairman)

Dr. Pawel Bozyk, Professor of Economics, Central School of Planning and Statistics, Warsaw, Poland

Lord Briggs, Provost, Worcester College, Oxford University, Oxford, UK

Dr. Carlos Chagas, Director, Institute of Biophysics, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil (Vice-Chairman)

Dr. Wilbert Kumalija Chagula, Ambassador, Permanent Mission of Tanzania to the United Nations in Geneva; and former Principal of the University College, Dar-es-Salaam, Tanzania

Dr. Jean Coulomb, former President, Academy of Sciences, Paris, France

Dr. Shams E. El-Wakil, Ambassador, Permanent Delegate of the Arab Republic of Egypt to UNESCO, Paris, France; former President of the Arab University of Beirut

Dr. Roger Gaudry, President, International Association of Universities, Montreal, Canada; former Rector of the University of Montreal (former Chairman of the Council, 1974—1975)

Dr. Hans Löwbeer, Chancellor of the Swedish Universities, Stockholm, Sweden

Dr. Felipe E. MacGregor, former Rector, Catholic University, Lima, Peru

Mr. Yoshinori Maeda, former President, Japan Broadcasting Corporation, Tokyo, Japan

Dr. Abdelsalam Majali, Minister of Education and Minister of State for Prime Ministry Affairs, Amman, Jordan; former President of the University of Jordan (Vice-Chairman)

Professor Malu wa Kalenga, Commissioner of Nuclear Sciences and Director of Kinshasa Regional Centre for Nuclear Studies, National University of Zaire, Kinshasa, Zaire

Dr. Antonio E. Marussi, Professor of Geodesy, Institute of Geodesy and Geophysics, University of Trieste, Trieste, Italy

Dr. Majid Rahnama, Resident Representative, United Nations Development Programme, Bamako, Mali (Chairman, Committee on Programme and Institutional Relations)

Dr. Marcel Roche, Investigador Titular; former Director, Venezuelan Institute for Scientific Research, Caracas, Venezuela (former Chairman of the Council, 1978)

Dr. Seydou Madani Sy, Rector, University of Dakar, Dakar, Senegal (Vice-Chairman)

Dr. Stephan Verosta, Professor of International Law, International Relations and Jurisprudence, University of Vienna, Vienna, Austria (Vice-Chairman of the Council and Chairman of the Committee of Finance and Budget)

Dr. Edward W. Weidner, Chancellor, University of Wisconsin, Green Bay, Wisconsin, USA

Dr. (Miss) Keniz Fatima Yusuf, former Secretary, National Education Council, Ministry of Education, Islamabad, Pakistan

### Rector

Dr. James. M. Hester

### Ex officio Members

Mr. Kurt Waldheim, Secretary-General, United Nations, New York, USA

Mr. Amadou Mahtar M'Bow, Director-General, United Nations Educational, Scientific and Cultural Organization, Paris, France

Dr. Davidson Nicol, Executive Director, United Nations Institute for Training and Research, New York, USA



Studies of the traditional technologies used in the villages of eight Asian nations are being carried out by UN University researchers who live and work in the villages. These studies are seeking to identify those technologies which might be transformed to improve the living standards of the rural communities in developing countries.

love during the first months of an infant's life; this could be important to the mental and physical development of a child born and bred in rural deprivation.

Such valuable and interesting insights on rural life and their significance for the development planner or rural development worker are constantly emerging. The Asian village mother, for example, traditionally carries her child while working. Yet if one relieves her of this "burden" by providing playpens for children, the increased mobility of the child in the playpen often leads to the worsening of its nutritional condition unless supplementary food is given. Also in the area of nutrition, a fresh look is being taken at traditional forms of exercise such as yoga, Chinese shadow boxing, and rhythmic dances. Such exercises use far less calories than the western forms of physical training to which the undernourished village children are often subjected in the early morning before they commence their school lessons. Such examples reinforce the value of this project to development workers, encouraging them to examine closely the linkages of traditional technology before changing or replacing them.

The project has been seeking to distinguish community-based traditional technologies—such as *shramadana*, the sharing of labour—from those that can function independently of a society's socio-cultural or religious backdrop. This helps to identify those technologies which may be most easily transferred. An example would be the

- Institute of International Relations for Advanced Studies on Peace and Development in Asia, Sophia University, Tokyo, Japan
- Institute of Pacific Studies, The University of the South Pacific, Suva, Fiji
- Institute of Peruvian Studies, Lima, Peru
- Thai Khadi Research Institute, Thammasat University, Bangkok, Thailand

#### Project on Research and Development Systems in Rural Settings

- Latin American Faculty of Social Sciences (FLACSO), Mexico City, Mexico (co-ordinating institution)
- Economic Development Foundation, Rizal, Philippines
- Ethiopian Science and Technology Commission, Addis Ababa, Ethiopia
- Institute for Studies of Rural Development "Maya A.C.," Mexico City, Mexico
- State University of Campinas, São Paulo, Brazil

#### Project on Sharing of Traditional Technology

- Marga Institute, Colombo, Sri Lanka (co-ordinating institution)
- Consumers Association of Penang, Penang, Malaysia
- Development Research and Communication Group, Kathmandu, Nepal
- Dian Desa, Yogyakarta, Indonesia
- Gakushuin University, Tokyo, Japan
- Institute of Philippine Culture, Quezon City, Philippines
- Thai Khadi Research Institute, Thammasat University, Bangkok, Thailand

#### Project on Technology Transfer, Transformation, and Development: The Japanese Experience

- Institute of Developing Economies, Tokyo, Japan (co-ordinating institution)
- Bunkyo Women's College, Tokyo,
- Department of Agriculture, University of Tokyo, Tokyo
- Department of Engineering, Tokyo Institute of Technology, Tokyo
- Department of Humanities, Tsukuba University, Tsukuba

- Department of Law and Economics, Aichi University, Toyohashi
- Faculty of Arts, Rikkyo University, Tokyo
- Faculty of Arts, Hanazono University, Kyoto
- Faculty of Commerce and Economics, Senshu University, Tokyo
- Faculty of Commerce, Hitotsubashi University, Tokyo
- Faculty of Economics, Hosei University, Tokyo
- Faculty of Economics, Kanazawa College of Economics, Kanazawa
- Faculty of Economics, Toyo University, Tokyo
- Faculty of Education, Niigata University, Niigata
- Faculty of Humanities, Ibaragi University, Mito
- Faculty of Law and Letters, Kanazawa University, Kanazawa
- Faculty of Political Science and Economics, Hiroshima University, Hiroshima
- Faculty of Social Sciences and Humanities, Tokyo Metropolitan University, Tokyo
- Faculty of Sociology, Hitotsubashi University, Tokyo
- Faculty of Sociology, Kansai University, Osaka
- Faculty of Technology, Toyo University, Tokyo
- Institute of Economic Research, Hitotsubashi University, Tokyo
- Japan Export Metal Flatware Industry Association, Tsubame
- Land Utilization Section, Department of Farm Management and Land Utilization, National Institute of Agricultural Sciences, Tokyo
- Mitsui Research Institute for Social and Economic History, Tokyo
- Niizu High School, Niizu
- Nuttari High School Nuttari
- Office of Policy Formation, Tokyo Metropolitan Government, Tokyo
- Planning Division, Planning and Co-ordination Bureau, National Land Agency, Tokyo
- Sanjo City Library, Sanjo
- Sendai Dai-ichi High School, Sendai
- Toei Ironware Co., Ltd., Sanjo
- Tokyo Gakugei University, Tokyo
- Tsubame High School, Tsubame
- Tsubame Industrial High School, Tsubame
- Wako University, Tokyo

\* The interests of Berlin (West) are represented in the United Nations by the Federal Republic of Germany

practice of drying cooked rice in Nepal so that it can be carried long distances and consumed without cooking after adding cold water. While this technology arose out of peculiar needs in a country like Nepal, it is one which is easily transferable and could be of great practical use in other societies.

Among the problems being encountered as the project moves forward is the manner in which to take advantage of traditional technologies without encouraging a negative self-reliance based on the past. Researchers are seeking methodologies in the transfer process which stimulate a positive self-reliance based on links to modern technology and the outside world when necessary. Another problem is the difficulty for researchers, who are often western-trained, to enter this field of study without an anthropological bias; they must be open to consideration of a wide range of traditional technologies. The recent developments in Iran and the People's Republic of China underscore the vital role of tradition in development, both politically and technologically.

The work being done by the project is contributing to the wider debate over alternative work patterns and lifestyles—the "other development" the world is seeking in the increasing global crisis of human alienation. Its ultimate goal is the development of socio-economic structures in the developing countries which will produce restrained and humanized technologies. The project expects to expand the scope of its activities during the latter half of 1979 with the inclusion of research efforts by groups in India and the People's Republic of China.

#### Research and Development Systems in Rural Settings

The central objective of this project is to integrate modern research and development systems in developing countries with the experience and knowledge of the traditional societies in order to tackle the technological problems of rural development.

Specifically, the project is developing a methodology for:

- (i) the generation of technologies for use by the rural poor through a process that involves their interaction with research groups;
- (ii) the utilization of capabilities and knowledge of the traditional societies—linking these to research and development systems of the modern sector to optimize the benefits for the rural poor; and
- (iii) the assessment of the strategy utilized by the participating research groups to develop technologies for rural areas and to undertake a comparative analysis of these strategies in different socio-economic situations.

To this purpose the project has put together research groups in three developing countries—Mexico, Ethiopia, and the Philippines—which are applying a common methodology of research. A monitoring and evaluation system has been designed to assess the effectiveness of the proposed approach.

The project is co-ordinated by the Latin American Faculty of Social Sciences (FLACSO), an international organization established by the Latin American countries in 1957 to promote teaching and research in the social sciences.

The methodology being used involves the following steps:

- (i) a general evaluation of the characteristics of the

particular research target area to determine the "problem situation," i.e., the socio-economic, cultural, and political conditions in which a technological problem is always immersed;

- (ii) analysis of the current situation by the local population and the research team together; based on this analysis certain problem areas are selected for further research;
- (iii) determination of the functions that a required technology is expected to fulfil; the aim is not to build a blueprint for technology, but to establish the set of constraints and requirements it should satisfy;
- (iv) analysis of solutions that the local community has traditionally given to the problems identified, with special emphasis on the **knowledge and ideas** contained in those technologies;
- (v) a general survey of the natural resources of the area is carried out. The concept is not of natural resources in an absolute sense, but rather as the combination of some natural object with science and technology; and
- (vi) from the information gathered by the foregoing efforts, a set of assumptions or paradigms will be derived. These will constitute the frame of reference for the final step of developing the required technology. The set of assumptions—which will contain scientific, technological, economic, psychosocial, and anthropological information—will define a **technological** space. All possible solutions that fit the technological space are considered.

A one-year pilot project was begun in March 1978 to test and refine the methodology to be used in the field. Research teams from the following institutions participated in the pilot project:

Institute for Studies of Rural Development,  
"Maya, A.C.," Mexico  
Ethiopian Science and Technology Commission,  
Ethiopia  
Economic Development Foundation, the Philippines

The pilot project sought to determine the effectiveness of the proposed technology in achieving the stated goals. The research teams were concerned, for example, with the best mechanism to obtain a fruitful and positive interaction with the local community or modifications in the methodology to adapt it to local conditions.

One of the main achievements of the pilot phase is that all of the teams succeeded in establishing effective community interaction. Although there were variations, depending on the particular situation, certain common elements emerged. The peasants initially tended to be distrustful, owing to previous negative experiences with outside researchers. It was important, therefore, that the scientists convince the peasants that they were not going to impose solutions, but rather seek possible solutions through joint action. This required living in the villages for extended periods of time and behaving as much as possible like the local people.

All of the teams agreed that effective interaction with the peasants was essential to successful completion of the initial socio-economic study. Having laid this groundwork, they could begin to identify the technological problems and



analyse local solutions.

The case of Ethiopia stresses the importance of true interaction with the peasants. There was far less initial distrust encountered because the rural populations had already been organized into peasant associations responsible for their own social, political, and administrative affairs. As a consequence, their attitude towards government officials has completely changed.

In Mexico, the researchers found that, owing to socio-economic constraints, the peasants were not willing to give their support to the activity—even though the researchers had been able to identify technological problems. As a result of this, the Maya team, during the next phase of the project, will seek to determine which are the minimum socio-economic constraints under which a technological solution is viable.

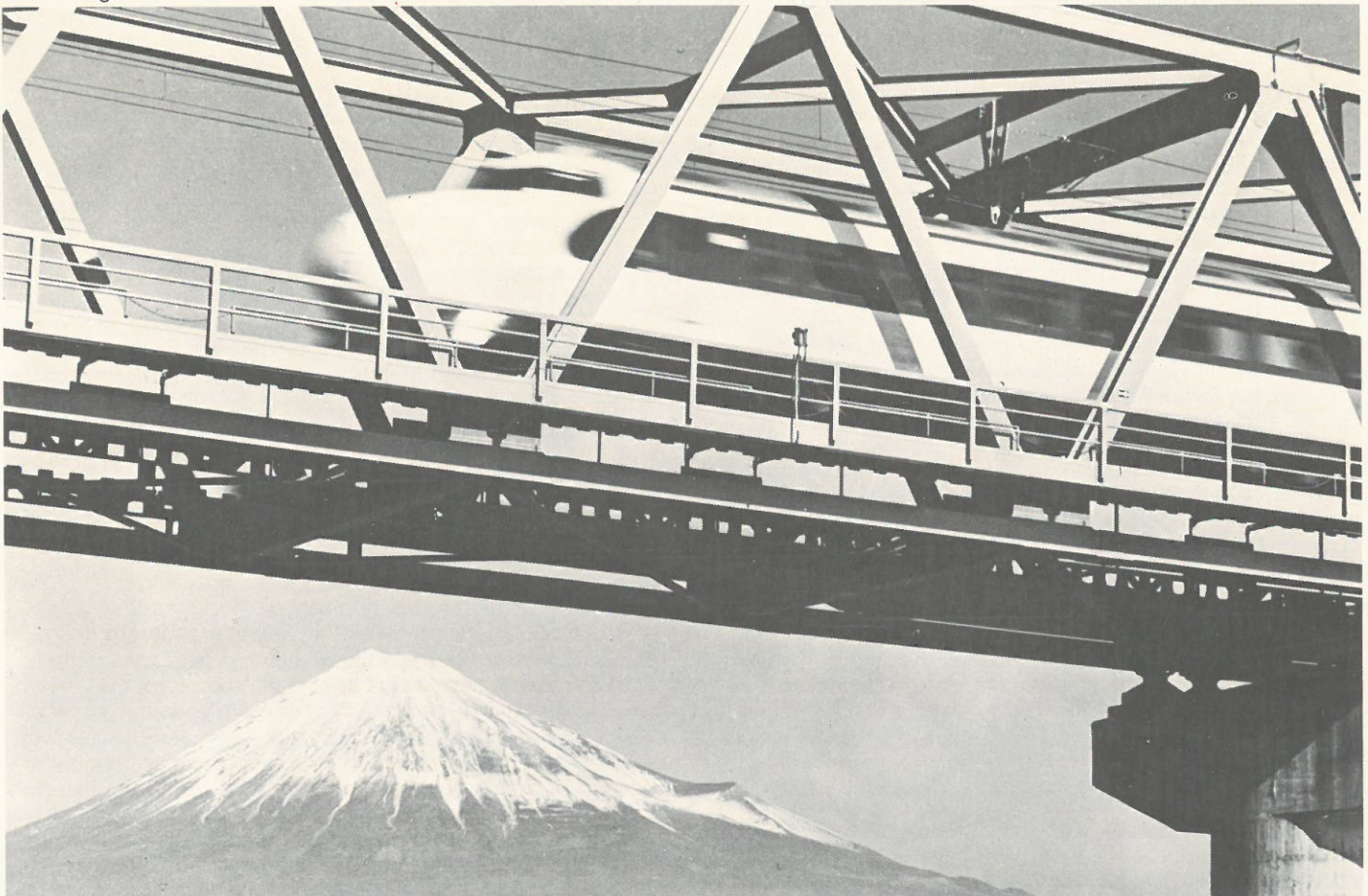
A research meeting attended by all team leaders was held in Mexico in October 1978 to discuss the work to date. It was agreed that the pilot project had permitted successful testing of the most important elements of the methodology, namely, the socio-economic analysis, mechanisms of interaction between researchers and villagers, and identification of specific problems of the links between rural communities and the research and development sectors. The project is continuing with special emphasis on the methodological steps dealing with generation of technologies.

### Technology Transfer, Transformation and Development: The Japanese Experience

This project seeks to study the interrelationships between endogenous and foreign technology during the process of industrialization in modern Japan. To this end, it is studying four types of situations that occurred during the process: (i) replacement of traditional or endogenous technology by imported modern technology; (ii) co-existence of the former with the latter; (iii) failure of modern to replace traditional technology; and (iv) integration of the two types of technology.

Emphasis is placed on the linkage between technology and labour (the working population being the "meeting place" between the old and new values); on the acquisition and dissemination of modern skills; on business management systems; and on the organization of labour, working discipline and conditions.

The project is co-ordinated by the Institute of Developing Economies in Tokyo. During the year under review, 34 scholars from 23 institutions throughout Japan were involved in the project (to date, the number of institutions involved in this project has increased to 36). They formed seven study groups on the following subjects: (i) technology and urban society; (ii) technology and rural society; (iii) the iron and steel industry and transportation; (iv) textile industries; (v) small-scale industries; (vi) mining industries; and (vii) technology transfer and the development of Hokkaido.



The UN University project on the Japanese Experience asks the question: How did the traditional culture and society of Japan react to the impact of Western technology during that country's modernization?

Twenty-eight study meetings of these groups were held and 30 field surveys were conducted jointly by the collaborating scholars and the staff members of the University project team at the Institute of Developing Economies. The main findings of this first year were the following:

- (i) the rise of modern industrial cities in Japan invited a rapid urbanization on a national scale, but unemployment and underemployment, rather than a shortage of skilled workers, were a serious problem;
- (ii) in order to feed the urban population, introduction of modern technology was required to improve rice cultivation; the rural communities had to accommodate themselves to this painful process of adaptation;
- (iii) the iron and steel industries were a new and hard experience for Japan, but a basic national need at the initial stage. Appropriate technologies were invented by local engineers and scientists to suit the Japanese condition (against the plan drawn up by foreign experts). The same obtained in the case of the national railway network, which played an important role in strengthening the national integration;
- (iv) the textile industries were a leading sector in Japanese industrialization; mechanization in this sector was possible because of an existing division of labour, both in the production process and in the specialization of products in different areas of the country. But the key factor for successful import substitution and export orientation was the manual skill of female workers;
- (v) the necessities of daily life were mostly produced by small-scale enterprises. In some of these industries, e.g., buttons and towels, production technology was imported, but the process was divided into several work processes. Some work was done on a piece-work basis by underemployed farmers' families. Use of cheap labour of this kind enabled these small-scale enterprises to compete in the world market; and
- (vi) the mining industries were the most successful examples of the introduction of modern technology, but this was limited to transportation and drainage techniques. The actual work system was untouched, leading to trouble afterwards.

Findings from the work to date will be published as a series of working papers. Continuing research is planned to produce more elaborate and comprehensive results on each subject. A feasibility study is also planned on the Ryukyu Islands as a case of development of remote island regions.

#### **EDUCATION FOR DEVELOPMENT**

In addition to its two sub-programmes concerned with problems and technologies of development, the Human and Social Development Programme is organizing an international educational programme focused on the global problems addressed by the University's three priority programmes. The three programmes will co-operate in this venture, which aims at achieving better integration, dissemination, and application of knowledge about development. This would entail educational activities in both the industrialized and developing countries.

#### **MEETINGS AND WORKSHOPS**

- Task force meeting on Human Rights, Vienna, Austria, June 1978
- Goals, Processes, and Indicators of Development Project, third network meeting, Geneva, Switzerland, October 1978
- Project meeting on Research and Development Systems in Rural Settings, Mexico City, Mexico, October 1978
- Project meeting on Sharing of Traditional Technology, Chiang Rai, Thailand, October 1978
- Asian symposium on Endogenous Intellectual Creativity, University of Kyoto, Kyoto, Japan, November 1978
- Programme Advisory Committee meeting, Tokyo, Japan, November 1978
- Consultative meeting with French scholars on the Human and Social Development Programme, Paris, France, January 1979
- Goals, Processes, and Indicators of Development Steering Group meeting, University of Bucharest, Bucharest, Romania, January 1979
- Programme Advisory Committee meeting, Tokyo, Japan, January 1979
- WHP/HSDP joint workshop on Goals, Processes and Indicators for Food and Nutrition Policy, MIT, Cambridge, Massachusetts, USA, March 1979
- Sharing of Traditional Technology project meeting, Yogyakarta, Indonesia, April 1979

# PROGRAMME ON THE USE AND MANAGEMENT OF NATURAL RESOURCES

It is increasingly recognized that the energy crisis and environmental degradation are two challenges that must be confronted world-wide by the industrialized and developing worlds together. The supply of energy and resources in the developing countries is inextricably linked to the demand in the rest of the world. Just as global in their implications are the consequences of unwise or wanton destruction of the earth's resources.

This perception was the basis for creating the Programme on the Use and Management of Natural Resources. Its basic goal is to expand understanding among developing world scientists of energy and resource use in their own countries. By facilitating the exchange of knowledge among countries and by carrying out research and advanced training, the programme seeks to increase production and access to resources among the rural populations in the developing world—more than half of the globe's people, most of whom are poor.

The programme is also exploring the use of practical alternative energy sources, studying how to apply effectively existing knowledge in the management of arid lands, and trying to learn how to increase production in the humid tropics while minimizing environmental disruption. Since the primary problems of insufficient manpower, inadequate knowledge, and poor use of existing information vary with both topic and location, the programme's emphasis changes considerably in order to attack the specific factors preventing the provident use of a given resource in a given area.

Many agencies are sponsoring research or training through short-term courses or fellowships at institutions, usually in the industrialized countries. However, few institutions are emphasizing the creation of networks and the exchanges between their centres. The specific mandate in the University's Charter for conducting advanced training, the use of research as the primary vehicle for training, the multidisciplinary character of the University-sponsored projects, and the bringing together of researchers working either on different aspects of the same problem or the same problem in different areas provide the characteristics that, in combination, give the Programme on the Use and Management of Natural Resources its distinctiveness.

**The effective establishment of the programme**—these six words summarize the work accomplished during 1978—1979. From the start of the programme through June 1978, the effort was essentially one of formulation and exploration—what topics should be considered and where could the programme carry out its research and training activities. In the year under review, the programme has increased the number of its associated institutions from one to nine, and associations are projected at two other institutions. Scientific workshops were held at six of the associated institutions, which defined the research and training activities that will be carried out during the initial three years of association. The UNU Fellows have been selected and are beginning their fellowships at associated institutions. The first three Special Fellows have completed their fellowships, and five more have started theirs. Exploratory missions have been carried out in over 30 countries by the programme staff or consultants. Seven research and training units have been established, and twelve more are in the planning stage.

## Perspectives and Activities of the Sub-programmes

### THE ECOLOGICAL BASIS FOR RURAL DEVELOPMENT IN THE HUMID TROPICS

The purpose of this sub-programme is to analyse traditional resource systems, and then to determine how modifications, adaptations, and the introduction of new technologies can be made to protect the environment, maintain or increase productivity, and satisfy the aspirations of the local population. Problems in this area are being approached by utilizing the concept of "resource systems," which can be roughly defined as the entire chain of events by which a raw material is collected and transformed into an end-product or a service. Such an innovative approach is useful for both research and education, as it helps to ensure a comprehensive view of the problems and to facilitate interdisciplinary co-operation. In a decision which has been reaffirmed by the programme's Advisory Committee, four resource systems were selected in May 1977 for the initial phase of the sub-programme: (1) rural energy systems, (2) agro-forestry systems, (3) water-land interactive systems, and (4) highland-lowland interactive systems.

In addition, the resource systems approach itself is being assessed, and attempts are being made to develop further the theory and methodology. Two seminars presenting various case studies have been held, one in the Philippines, 29 May—2 June 1978, the other in the Republic of Korea, 28 May—1 June 1979, and a report on these will be published later this year. Attempts will be made to adapt this approach to other areas of the programme.

#### Rural Energy Systems

Inasmuch as adequate energy supplies are critical to development, the first of the resource systems under investigation is rural energy systems. The primary source of fuel in many rural areas of the humid tropics is wood, and an overdependence on this source can lead to environmental deterioration and hinder future progress. By examining the mix of energy sources available and analysing the economic and social processes that determine the production and distribution of fuels, a number of practical, as well as theoretical, insights will be gained. A better understanding of rural energy systems will contribute to more effective management policies, which would, if adopted, not only increase the available energy supplies but also lessen long-term environmental deterioration. The possibilities for



Firewood is still the primary source of fuel for much of the third world, and the widening search for it has helped cause deforestation and desertification. A project on Rural Energy Systems is studying this problem. The Natural Resources Programme stresses that the energy and ecology concerns of developing countries are closely linked to those of the rest of the world.

technological innovation, whether through non-conventional energy sources such as biogas, or through less drastic changes such as more efficient cooking-stoves, are also being investigated.

A comprehensive study of this type has been initiated at the University of Ife in Nigeria. Detailed formulation of the project took place during a workshop in August 1978, at which time the agreement making the University of Ife an associated institution was signed. Five topic areas in the study are currently under investigation. They are:

- (i) socio-cultural factors affecting rural energy preferences;
- (ii) urban market influences on rural energy production and use;
- (iii) geographical patterns of fuel wood production and depletion of supply;
- (iv) fuel wood species in relation to vegetation dynamics and land use; and
- (v) supply of energy from fuel wood plantation and alternative sources.

These five topics will be pursued in relation to urban centres of varying sizes and in different ecological zones encompassing much of south-western Nigeria. In addition to the University support, US\$25,000 is being provided by the Ford Foundation, and other sources of funding are also being sought. Following University practice, Fellows from areas with similar problems or conditions will be brought to the University of Ife to work in association with the project for a period of six to twelve months. After gaining additional knowledge and experience, the Fellows can then initiate similar projects in their own countries, thus multiplying the effectiveness of the University's activities. In this respect, as a first step, efforts are being made to start similar studies on a smaller scale in other parts of West Africa and Malaysia.

On a wider scale, a study has been commissioned to look at the traditional use of wood and charcoal throughout Europe, Africa, and Asia. Utilizing existing data, a planned publication should provide a clear view of the dependence upon wood and the environmental consequences of this dependence. A similar study and publication are planned for Latin America.

#### **Agro-forestry Systems**

In much of the humid tropics, increasing population and rising demands for food and raw materials for export press heavily on traditional systems that have evolved mainly to meet subsistence needs and local exchange. The resulting intensification of agriculture, often by adopting inappropriate techniques developed in temperate areas, almost always leads to the vicious cycle of environmental deterioration and a lowering of productive capacity. One of the most promising methods for sustaining high productivity while minimizing social and environmental damage is agro-forestry systems, which combine tree and field crops and sometimes livestock as well. Studies of traditional land-use practices could provide much of the information needed to develop appropriate agro-forestry techniques that are specific to a given culture and location.

The Tropical Agricultural Research and Training Centre in Turrialba, Costa Rica, is serving as the main centre for the project on agro-forestry systems. Typically, this associated institution conducts research under University auspices and serves as the main centre for training Fellows in this field. A



"Slash-and-burn" cultivation, which is practised in many parts of the world, can lead to widespread environmental deterioration, as shown in the sequence of photographs above from northern Thailand. Research on the impact of such practices is being carried out in Thailand at Chiang Mai University, an associated institution, together with studies on agro-forestry techniques used elsewhere in similar climatic conditions.

workshop in March 1979 brought together scientists, primarily from the Latin American region, to discuss the state-of-the-art of agro-forestry in Latin America, and the proceedings are being published. Research has begun on the use of trees in pastures, in combination with perennial crops, as live fence posts and in stabilizing slopes.

Another nodal point in the network is Chiang Mai University in Thailand. Three Special Fellows from Chiang Mai visited the Tropical Agricultural Research and Training Centre in mid-1978. As a result, agro-forestry research has now become an integral part of the project in Chiang Mai, and a workshop on agro-forestry in South-East Asia is scheduled there for late 1979.

As a result of the recent world-wide surge of interest in agro-forestry, a number of possible training links are being explored. A small research and training unit has been established at the Wau Ecology Institute in Papua New Guinea, and this is being used as the basis for the advanced training of local scientists. The creation of the International Council for Research in Agro-Forestry has resulted in a number of research projects throughout the humid tropics, and close consultation is taking place to determine the most appropriate interaction. The programme is planning to publish a regular newsletter on agro-forestry in co-operation with the International Union of Forest Research Organizations.

#### Water-land Interactive Systems

Given the pressures for development and an expansion of production on the one hand and the environmental constraints so often present on the other, an examination of the interactions between land and water is critical for the future development of the humid tropics, especially in coastal areas. In large areas, freshwater swamps, rivers, and estuaries are important sources of protein for populations that are often on minimal diets. In these areas, changes in the watershed, caused either by development projects or through the chain reaction of deforestation, erosion, flooding and sedimentation, can severely disrupt the local economic and social system and reduce its resource base. Beginning with a better understanding of brackish water fish ponds (*tambaks*) in Indonesia, the University project is attempting to develop management techniques that would ultimately be applicable to other areas.

A programmatic workshop in September 1978 formulated the research programme, and at this time Bogor Agricultural University signed the agreement that made it an associated institution and the institutional base for the project. Research is concentrating on *tambaks* as a resource system, and is investigating the links with both animal husbandry and rice farming. Through a better understanding of the inputs into and possibilities of *tambaks*, a more effective utilization of resources is possible. Again through the creation of a network and the sponsoring of UNU Fellows, it is hoped that the repercussions of the work will spread throughout South-East Asia.

Closely related to these activities is the emerging project on coastal zones, which can also be regarded as a type of water-land interactive system. A small task force meeting in April 1978 recommended establishing a series of one-year training programmes in developing countries. Initially based in Indonesia, where manpower training is one of the major goals of the country's current five-year plan, the pilot project will include a group of approximately six young scholars training in the techniques of survey, research, and

problem-solving necessary for effective coastal resource management. Intensive study of specific local problems will provide data useful for management and valuable experience for the graduates. Relevant material from other coastal regions will provide a broader basis for the assessment of coastal problems in general.

By continuing and expanding the course over several years, the project is attempting to establish a self-reinforcing network of trained scholars working on coastal resource management and research, and a set of scholarly baseline studies to illustrate particular kinds of human impact on coastal areas. Efforts are being made to establish a similar programme in the Middle East or Latin America.

#### Highland-lowland Interactive Systems

Highlands in the humid tropics often support large populations on their limited but none the less valuable resource base. Excessive pressure on the resources can result in severe environmental damage, such as erosion, flooding, and sedimentation, and highland-lowland interactions have typically been evaluated only in these terms. However, the social and economic exchanges between those geographic areas must also be considered, not only the effects of the highlands on the lowlands, but also the effects of the lowlands on the highlands.

In Thailand, the work on agro-forestry, soil erosion and related topics is seen in this larger context, and it is hoped that the initial grass-roots work will lead into more comprehensive studies on the exchanges of labour, goods, and capital between the highlands and the lowlands.

In Papua New Guinea, work which is primarily concerned with training nationals through research is being undertaken by the University of Papua New Guinea. In co-operation with UNESCO, one study is concerned with the movement of highland Goilala people from the interior to the area along the Hiritano highway and Vanapa River near Port Moresby, where the people settle both in planned schemes and more commonly as squatters. The research is focusing on the impact of settlement and cultivation, the type of cultivation systems, and the socio-cultural characteristics of the migrants. Efforts are now being made to establish similar projects in other areas, as there is a great need for both trained manpower and data on which to base management decisions.

The main activity within this project area is concerned with natural hazards, particularly landslides and flooding, in Nepal. Specifically, the objectives are: (1) to work with Nepalese authorities to develop a prototype natural hazards map; (2) to begin assessment of human responses to natural hazards; and (3) to lay the foundations for systematic natural hazards mapping by local workers who will be trained during the introductory phases of the project. Adapting techniques that have been developed in Switzerland and Colorado, in March 1979 a task force selected two areas of the middle mountains of Nepal with a representative range of landscape types and land-use practices for the testing and development of the mapping legend. Since training is an integral part of the project, three young Nepalese scientists are now at the University of Colorado at Boulder to participate in a mountain ecosystem training programme. The University of Colorado at Boulder became an associated institution in May 1979, with training as its primary role. In September 1979, systematic field work will begin with an interdisciplinary team of Nepalese and outside experts. The re-



Natural hazards mapping, a technique developed in Europe and the US, can be a useful tool in countries such as Nepal where landslides destroy agricultural lands and increase soil erosion. UNU Fellows from Nepal are being trained at an associated institution in Colorado to make natural hazards maps of the Kathmandu Valley (left), in collaboration with American and Swiss scientists.



sultant maps should prove a valuable basis for land-use planning, and the project as a whole will provide a detailed case study on human responses to natural hazards. The project is being executed in close collaboration with the Man and the Biosphere programme of UNESCO.

#### ASSESSMENT OF THE APPLICATION OF KNOWLEDGE TO ARID LANDS PROBLEMS

Arid lands (including semi-arid and hyper-arid) comprise some 30 per cent of the world's land surface and include 14 per cent of the world's population, many of whom are considered the "poorest of the poor." The patchy distribution of development planning and projects has generally passed over arid lands, resulting in ever larger income gaps for their population when compared to other areas. Overgrazing, dryland farming, and the stripping of wood and other organic materials for feed and fuel can seriously impair the capacity of the land to sustain life. Fluctuations in rainfall, a natural characteristic of arid lands, only intensifies the existing problems of poverty and environmental deterioration.

In recent years, considerable funds have been spent and much knowledge has been gathered about arid lands, but major mismanagement—or lack of management—continues. The United Nations Conference on Desertification, held in Nairobi from 29 August to 9 September 1977, emphasized that existing knowledge, while by no means complete, is sufficient to alleviate the most immediate problems of arid lands. Thus the Programme on the Use and Management of Natural Resources is focusing first on the factors preventing the effective use of knowledge, and then on the development and implementation of means to overcome the identified difficulties.

As the first step in assessing the effectiveness of the transfer of knowledge, the programme has commissioned 10 studies on topics such as the assessment of various development projects, a critical look at nomad sedentarization schemes, the variations in the perception of desertification, and the obstacles to the extension of knowledge from research stations or scientists to the people in the surrounding area. Most of these studies are now undergoing review in

preparation for publication, and the results will be brought together at a workshop in late 1979. This workshop, together with an additional theoretical study now being concluded, will serve to guide the next stage of the sub-programme in developing specific management manuals, training materials, and general management guidelines.

Activities are centred at the University of Khartoum in the Sudan, which became an associated institution in October 1978 when the agreement was signed during a planning workshop. The workshop, the findings of which are being published, identified five topic areas for assessment studies: (1) conservation of resources; (2) social acceptance of new ideas; (3) perception gap relative to change; (4) administrative structure and the links between plans and action; and (5) the flow of research information. Specific aspects of each topic are being investigated through a series of assessment studies in the Sudan, and these should be concluded by the end of 1980. The programme will then move into the second phase of work, trying to develop means of improving the transfer of information. Work at the University of Khartoum is being supported by additional work in the Sudan through the University of Swansea, UK, and by scholarships at the University of Khartoum and the University of Hamburg, which are being provided by bilateral funds from the Federal Republic of Germany.

Considerable expansion is foreseen in this sub-programme over the next two years, with emphasis in Latin America. A visit will be made to Peru, Argentina, and Chile to explore the possibilities in South America, and activities there will begin with a workshop scheduled for Mexico in early 1980. Continuing contact with the Central Arid Zone Research Institute in Jodhpur, India, will probably lead to the formal establishment of a link. The University of New South Wales in Sydney, Australia, became the second associated institution in this sub-programme in April 1979. Its functions will be primarily to provide advanced training that is not available at other existing or proposed centres in the network. The first UNU Fellow in this sub-programme began

training at the University of New South Wales in June 1979; other potential Fellows are now being identified.

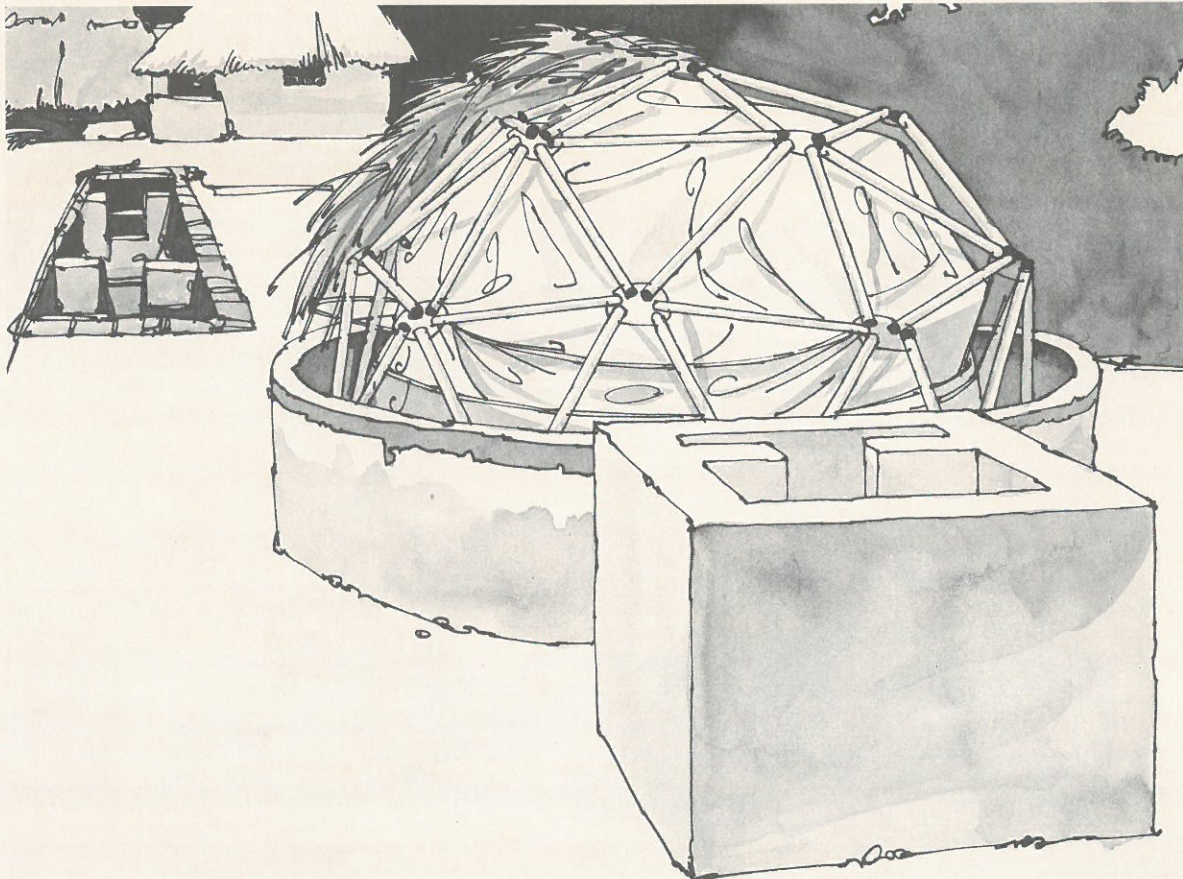
In all these activities, close collaboration is maintained with the United Nations Environment Programme, which is responsible for the co-ordination of the Plan of Action to Combat Desertification, and other United Nations organizations, such as the UN Sahelian Office and UNESCO. Many close links are also being maintained with the academic community, as evidenced by the joint UNU-International Geographical Union meeting on desertification held in Arizona in January 1979.

### ENERGY FOR RURAL COMMUNITIES

With the increasing global awareness of the important role played by energy in determining the quality of life, it has become apparent that most rural areas in developing countries have always subsisted at very low levels of energy consumption. With 60 per cent of the world's population in rural communities, it is appropriate that this programme begin working on energy in rural communities in developing countries. Dependable sources of substantial quantities of energy can lead to an increase in local agricultural and industrial production, conservation of the surrounding vegetation, an increase in the time available for children to learn and for mothers to care for their families, and an opportunity for rural society to extend its horizons beyond a subsistence economy to a society which is capable of technological and cultural development along endogenous lines.

The emphasis of this sub-programme on the use of

Much of the energy needs of rural communities of the third world could be met with de-centralized alternative energy sources such as the village-level digester (at right) for converting waste material into biogas—one of a variety of alternative energy techniques being studied by the Natural Resources Programme.



renewable decentralized sources to provide needed energy is dictated by the dispersed nature of most rural communities. Electrification of these communities through power grids is advancing at a very slow pace, and fossil fuels are generally too costly to provide a generally viable alternative. In view of the fact that appropriate small-scale energy systems based on renewable sources do exist at low cost, the programme is working to adapt this technology to local conditions and to devise ways of introducing new systems into rural communities. The primary goal of this sub-programme is, therefore, to conduct multidisciplinary research and advanced training which will lead to the successful introduction of energy systems based on the optimal utilization of available solar, bioconversion, wind, and other environmentally sound, renewable sources. This work is carried out primarily through existing institutions, as one of the primary goals of the University is to strengthen research and training capability in developing countries. A principal component of these efforts is an information dissemination service to provide scientists with up-to-date information concerning technologies applicable to their local conditions, and contacts with colleagues working on similar problems in other developing countries.

### Pilot Projects

The primary methodology selected to achieve the programme's goals is the establishment of a series of pilot projects, each of which is concerned with the introduction of renewable energy systems to rural communities. The objective of every pilot project is to demonstrate the use of those locally available renewable energy sources most appropriate

to each task within the geographical and social context. Emphasis is placed on utilizing a diversity of energy sources, while at the same time integrating these energy systems into the fabric of the local society. Thus, the multidisciplinary approach covers not only the adaptation of existing technology to local conditions but also the economic, socio-cultural, environmental, institutional, and health aspects which will determine the acceptability of the system to the users. Each pilot project will include a training component in the technological adaptation as well as in the process of selecting, integrating, and introducing components of new systems and improved traditional systems into communities in their countries.

The first pilot project was launched in Algeria in September 1978. The National Organization for Scientific Research is the associated institution undertaking the planning and execution of the project. A pilot village will be constructed at Ain Hnache in the Wilaya of M'Sila by the Organization's Research Centre on Architecture and Urbanism, and it will serve as the practical centre for the project. As the result of discussions at a workshop held in April 1978 in Algiers, the project, which is concerned primarily with architecture, building materials and energy use, will include the application and integration of solar energy to tasks such as water pumping, heating, and desalination.

The second project is planned for Iran. A significant difference in the proposed Iranian project is that its emphasis will be on adapting renewable energy devices to a traditional village and its structures rather than constructing a new village, as is the case in the Algerian project. It is planned that the technology will be introduced to and assessed by the villagers through an existing system of rural health clinics. The solar energy devices to be demonstrated and used in the health clinics include autoclaves for sterilizing medical instruments, water heaters, and power generation for lighting and telecommunications.

As a network of these village pilot projects is planned, an evaluation mission visited the Sahel region and East Africa in April and May, and discussions are continuing regarding possible projects in these areas. The annual sub-programme workshop for 1980 is also planned for this region in order to continue building the necessary scientific and institutional links.

Establishment of small research and training units is planned to complement these major pilot projects. Initial

units will probably be associated with the joint project on Solar Food Conservation Systems for Rural Communities (see page 8) and might be located in Latin America and Africa south of the Sahara.

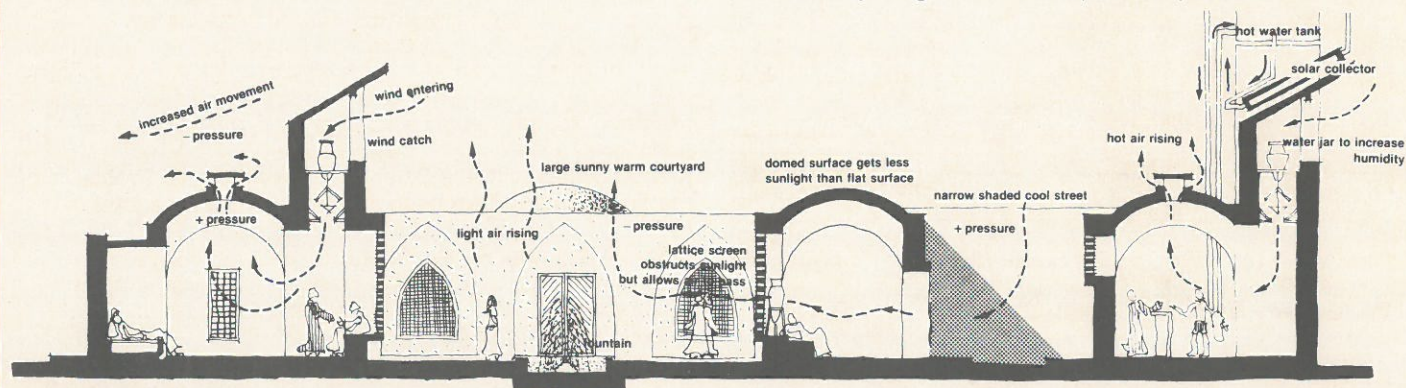
### Energy Studies

Energy planning and policy making are now given high priority in many developing countries. However, in most nations, studies of energy resources, supply, and utilization are carried out independently by government agencies on the one hand and the producers and suppliers of various types of energy on the other. The programme, realizing the value of co-ordinating these activities, is continuing to explore the possibility of establishing national centres for data collection, modelling, and planning in the field of energy. Such a centre could supply short-term and long-term policy recommendations consistent with national goals. Progress on the establishment of the first such centre is awaiting the approval of the Government of India.

### Dissemination of Information

A comprehensive programme of information dissemination is being developed to break the isolation of scientists in developing countries working in the fields of solar, bio-conversion, and wind energy technologies. The first phase of this effort began in January 1979 with the launching of a monthly publication *ASSET: Abstracts of Selected Solar Energy Technology*. Each issue includes abstracts from recently available books, articles, reports, and conference papers relevant to rural communities in developing countries. Recipients of *ASSET* are organized into an information exchange network of scientists working in solar energy in the developing world, with each participant expected to provide his own scientific contributions for *ASSET*. Once the *ASSET* network has stabilized, with an estimated 500 participants, it is planned to distribute at cost, upon request, full copies of all documents abstracted in *ASSET*.

A University-sponsored Conference on Energy Alternatives was held in Honolulu in January 1979. With the co-operation of the East-West Center, the University of Hawaii, and the International Institute for Applied Systems Analysis, this conference was held to discuss the anticipated global energy situation over the next 50 years and to determine the role that alternative energy sources would be able to play in satisfying the growing energy demand. The environmental and social impacts of the various alternatives were considered at length. The proceedings of the conference were published by Pergamon Press, London, UK.



The world's first integrated solar village, a Natural Resources Programme project in Algeria, will combine low-cost solar energy technology with traditional features of desert architecture for cooling and heating processes, and is designed to supply all the village's energy needs.



Finally, a series of monographs on renewable energy sources and their utilization is being commissioned. These monographs are intended to provide up-to-date information on: (1) the state-of-the-art of these energy technologies and their relevance to rural communities in developing countries; (2) hitherto neglected traditional technologies and the principles upon which they operate; and (3) the social, cultural, economic, environmental, and institutional aspects involved in introducing these technologies in developing countries.

#### Geothermal Energy

The many developing countries possessing geothermal energy fields are at various stages in their efforts to harness this energy source. Five are already utilizing geothermal energy for electricity production and other applications, 19 have begun exploration and research programmes to determine their potential for exploitation, and 18 others are expected to commence exploration in the near future. In view of the level of interest and the fact that geothermal energy in some countries can be a very significant, environmentally and economically sound energy source, activities have been initiated in this field. A workshop on training needs in geothermal energy was held in Laugarvatn, Iceland, in July 1978, with participants from the United Nations, UNESCO, representatives from the other international



Geothermal energy can be an environmentally and economically sound energy source for many developing countries. Shown above, geologist Nelson Bagamasbad of the Philippines, a UNU Fellow, during training in modern geothermal energy techniques at the National Energy Authority in Iceland, an associated institution.

training programmes, and various specialists from selected developing countries. The workshop reached a consensus on the need for a practical, high-level training programme. Thus the programme has launched such a training programme in co-operation with the National Energy Authority of Iceland. This consists of a series of eight short courses specializing in specific aspects of geothermics. On the basis of another recommendation of the workshop, the University will establish an international geothermal studies forum to co-ordinate existing training programmes, and to recommend new and modified programmes. The first meeting of this forum is planned for mid-1980 in either Italy or New Zealand.

The programme is planning to expand its activities by helping to strengthen an academic training course on geothermal energy at Kyushu University in Japan. Established solely for personnel from developing countries, this course will be complementary to the more practical course in Iceland. Indeed, some of the people who have completed the theoretical course in Japan may then proceed to the Icelandic programme.

#### Relations with Other Organizations and Institutions

Throughout the formulation process, the Programme on the Use and Management of Natural Resources has given careful attention to other international programmes already operating in order to avoid any duplication of effort. Experts and consultants from other UN agencies, including UNESCO, FAO, and UNEP, participated in the initial formulation of the proposed activities in 1979. Since then, representatives from these and other agencies have been involved in the planning meetings for specific projects, and this is reflected in the development of joint activities. The UNESCO Man and the Biosphere Programme (MAB) has been assisting with University projects in Nepal and Papua New Guinea, and the University plans to co-sponsor a workshop in Mexico with the Intergovernmental Oceanographic Commission, UNESCO and the UN. In the field of geothermal energy, UNESCO, UNDP and the Centre for Natural Resources, Energy and Transport agreed that the University should play a co-ordinating role. Discussions are under way whereby the United Nations Disaster Relief Organization would provide assistance to the project on natural hazards mapping. In regard to arid lands, close communication is being maintained at both official and working levels with UNEP, and UNEP has the primary responsibility for co-ordinating all activities relating to the Plan of Action to Combat Desertification. Consultations are also taking place with the UN Sahelian Office and the UNESCO MAB programme.

In regard to non-governmental organizations, close ties are being maintained with a number of the different unions within the International Council of Scientific Unions. With the International Geographical Union, the University co-sponsored a meeting on desertification, and discussions for joint activities with the Scientific Committee on Problems of the Environment have been under way. Finally, a joint newsletter on agro-forestry is being discussed with the International Union of Forest Research Organizations. Foundations have been contacted for additional project funding, and bilateral assistance from Switzerland, the Federal Republic of Germany, and the US is strengthening various programme projects.

Thus through a number of personal and official ties active communication lines are being maintained, and this produces the visible results in complementary programming.

On their travels, programme staff and consultants make every effort to consult personally all relevant organizations. Indeed, the vastness of the problems being attacked means that efficient utilization of resources and good planning are all more important considerations than the potential "overlap" of agencies grappling with a complex global deficiency of knowledge.

### Associated Institutions

#### Actual

- Bogor Agricultural University, Bogor, Indonesia
- Chiang Mai University, Chiang Mai, Thailand
- National Energy Authority, Reykjavik, Iceland
- National Organization for Scientific Research, Algiers, Algeria
- Tropical Agricultural Research and Training Centre, Turrialba, Costa Rica
- University of Colorado, Boulder, Colorado, USA
- University of Ife, Ile-Ife, Nigeria
- University of Khartoum, Khartoum, Republic of the Sudan
- University of New South Wales, Sydney, Australia

#### Projected

- Academia Sinica, Beijing, People's Republic of China
- Institute for Animal Nutrition Research, Wageningen, Netherlands (jointly with World Hunger Programme)

Research and Training Units are based at the institutions listed below:

#### Actual

- International Institute for Aerial Survey and Earth Sciences, Enschede, Netherlands
- National Institute of Oceanology of the Indonesian Institute of Sciences, Jakarta, Indonesia
- National Institute of Science and Technology, Manila, Philippines
- National Planning Commission, Kathmandu, Nepal
- University of Papua New Guinea, Port Moresby, Papua New Guinea
- University of Swansea, Swansea, UK
- Wau Ecology Institute, Wau, Papua New Guinea

#### Projected

- Agricultural University, La Molina, Lima, Peru
- Autonomous Agricultural University "Antonio Narro," Saltillo, Mexico
- Central Arid Zone Research Institute, Jodhpur, India
- Chung-Ang University, Seoul, Republic of Korea
- East-West Center, Honolulu, Hawaii, USA
- Kagoshima University, Kagoshima, Japan
- Southeast Asian Fisheries Development Center, Manila, Philippines
- Tanzania National Scientific Research Council, Dar-es-Salaam, Tanzania
- University of Campinas, Campinas, Brazil
- University of Hamburg, Hamburg, Federal Republic of Germany
- University of Kyushu, Fukuoka, Japan
- University of Malaya, Kuala Lumpur, Malaysia

### MEETINGS AND WORKSHOPS

- Workshop on Geothermal Training, Laugarvatn, Iceland, July, 1978
- Programmatic workshop on Highland-lowland Interactive Systems and Agro-forestry Systems, Port Moresby, Papua New Guinea, July 1978
- Workshop on Rural Energy Systems, Ile-Ife, Nigeria, August 1978
- Workshop on Water-land Interactive Systems, Bogor, Indonesia, September 1978
- Programmatic workshop on Arid Lands Management, Khartoum, the Sudan, October 1978
- Programmatic workshop on Highland-lowland Interactive Systems, Chiang Mai, Thailand, November 1978
- Joint WHP-NRP international conference on the State-of-the-Art of Bioconversion of Organic Residues for Rural Communities, followed by a two-day task force meeting, Guatemala City, Guatemala, November 1978
- Intercongress meeting of International Geographical Union Working Group on Desertification in and around Arid Lands and UNU-NRP Arid Lands Sub-programme, Tucson, Arizona, USA, January 1979
- Conference on Energy Alternatives, Honolulu, Hawaii, USA, January 1979
- Steering Committee and Advisory Committee meeting, Tokyo, Japan, January 1979
- Workshop on Agro-forestry as a Tool for Development in Tropical American Region, Tropical Agricultural Research and Training Centre, Turrialba, Costa Rica, March 1979
- Task force on Natural Hazards Mapping, Kathmandu, Nepal, April 1979
- Task force on Resource Systems Theory and Methodology, Seoul, Republic of Korea, May 1979
- Mini-symposium on Decentralized Recycling Methods for Waste Management in Industrialized Countries, Stockholm, Sweden, May 1979
- Joint WHP-NRP task force meeting on the State-of-the-Art of Bioconversion of Organic Residues for Rural Communities, Stockholm, Sweden, June 1979
- Seminar on Solar Technology in Rural Settings: Assessments of Field Experiences, Atlanta, Georgia, USA, June 1979

# PUBLICATIONS

The University's publications programme grew considerably during the year as the results of initial programme research activities became available.

Two periodicals were launched:

The *Food and Nutrition Bulletin*, published quarterly, carries scientific articles and technical information on the world hunger problem and efforts to combat it, with special attention given to the work of the World Hunger Programme. Published in collaboration with the Sub-Committee on Nutrition of the UN Administrative Committee on Co-ordination, it incorporates and continues the *PAG Bulletin*, formerly published by the UN Protein-Calorie Advisory Group.

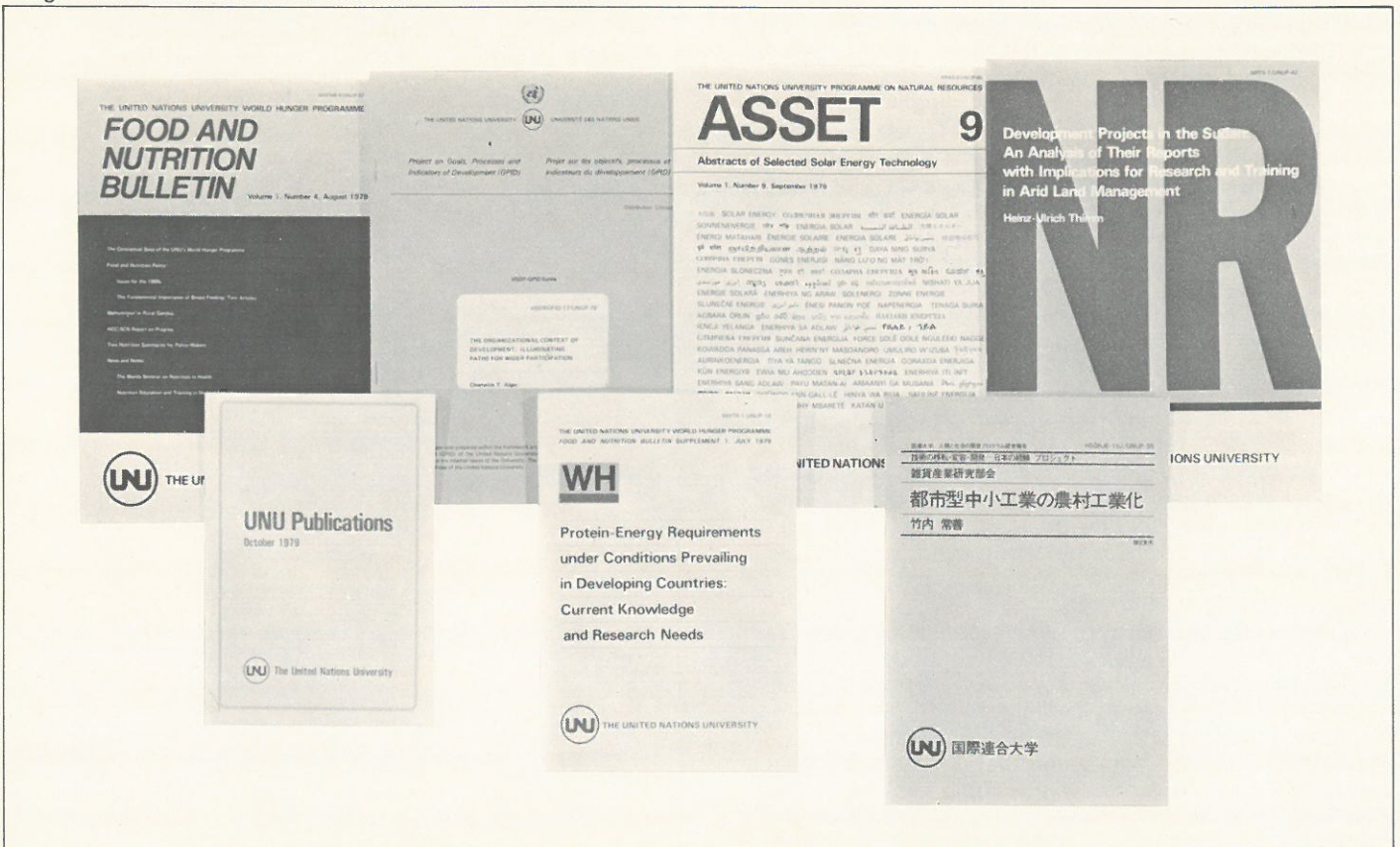
*ASSET (Abstracts of Selected Solar Energy Technology)* is published monthly. It contains abstracts of currently available books, articles, reports, and conference papers, with emphasis on information of value to rural communities in the developing countries. *ASSET* is distributed free-of-charge to scientists and engineers in the energy field in developing countries. It forms the basis of an information network among developing country scientists in this field who might otherwise remain isolated from one another and from valuable information.

During the year, the University also issued 30 other publications designed to inform scientists and scholars about the work of its programmes. The World Hunger Programme began a Technical Report Series which contains reports of programme workshops, conferences, and other meetings. The Human and Social Development Programme launched three publication series: Human and Social Development Publication Series, Research Paper Series, and Programme Documents. These series serve as media for

increased international dialogue and dissemination of information about the emerging concepts of development and related approaches and policies discussed and analysed at meetings around the world. The Programme on the Use and Management of Natural Resources began two series, Technical Series and Report Series, which present research results, reports of meetings, and state-of-the-art reports on subjects relevant to the programme's interests. Publications in these series are designed to be useful not only to ecologists, environmental scientists, geographers, and agriculturalists, but also to social scientists and other development specialists who are concerned with development in rural settings.

University publications are co-ordinated by the Academic Services division which also maintains the University Centre library and information referral services. In addition to its continuing expansion of the library, Academic Services has started an on-line retrieval system.

The University's Information Services also produced a variety of brochures, leaflets, and other material over the year designed to increase world-wide awareness of the work of the University. It began a "Work in Progress" supplement to the quarterly *UNU Newsletter* containing excerpts from research reports and proceedings of workshops and symposia of the University. Information Services also expanded its distribution of the University film, "Knowledge Without Boundaries," and, in co-operation with the Department of Public Information, United Nations, New York, completed work on an updated film which will be available in late 1979.



# FUND-RAISING, FINANCE AND BUDGET

There were significant break-throughs in fund raising during the period 1 July 1978 to 15 December 1979. Major pledges to the Endowment Fund were made by two leading industrialized countries: the United Kingdom pledged approximately US\$9.8 million and the Federal Republic of Germany approximately US\$4.3 million. Among the developing countries, Thailand made an endowment-level pledge of US\$0.5 million. The Governments of Chile, Ethiopia, Malaysia, Nigeria, Sri Lanka, and the United Republic of Tanzania made annual pledges or contributions for the first time. Japan contributed another US\$10 million, bringing its total contribution to US\$80 million against its generous pledge of US\$100 million.

The British pledge was made to that section of the Endowment Fund designated for work concerning the developing countries; provision for pledges for this purpose was approved by the Council of the University at its ninth session in December 1977. The new pledges received this year further endorse the importance of the endowment fund principle for the financing of the University and reflect confidence in its programme activities.

In all, a total of approximately US\$ 27.4 million was pledged and/or contributed during the period under review. Of the total, approximately US\$ 14.6 million constitutes new endowment pledges, the remainder being payments on pledges already made and annual contributions. Pledges to the Endowment and Operating Funds from 28 Governments now total US\$ 141.9 million, of which US\$93.9 million has been received.

Contributions for projects were also received from a number of government-related and non-governmental sources. Part of these funds were provided directly to hosts of UN University events. During the period under review, a total of approximately US\$368,580 was received from or promised by the following sources: Canada—International Development Research Center; Japan—Toyota Foundation, Japan World Exposition Commemorative Fund, and Agricultural Chemical Society/Japanese Society of Food and Nutrition; Mexico—Centre for Economic and Social Studies on the Third World; USA—Ford Foundation, Henry Luce Foundation, Rockefeller Foundation, and the Long Beach Chapter of the United Nations Association; and International Planned Parenthood Federation: Contributions have also been received from individuals in Japan. UNESCO has committed a total of US\$18,000 for programme activities.

A number of Governments, institutions and others have contributed funds in cash and in kind towards the organization of consultative meetings, workshops, and seminars which are difficult to quantify. It should also be noted that the University's financial support to associated institutions, research units, and other elements of the University network has in turn helped in obtaining extra funds for the activities of those institutions from Governments and other sources within their countries.

The Rector and the Vice-Rector for Planning and Development visited or revisited 15 countries between 1 July 1978 and 15 December 1979. In addition, staff members of the Planning and Development Division visited some of these countries and 15 others. The University Information Representative in London has undertaken a number of preparatory visits to countries in Europe. The University liaison office in New York keeps in regular contact with the Permanent Missions to the United Nations. Dr. I. Wesley

## Pledges and Contributions from Governments to the Endowment Fund as of 15 December 1979 \*

	Pledged	Paid
Japan	US\$100,000,000	US\$80,000,000
Venezuela	10,000,000	4,000,000
United Kingdom (£5,000,000)	9,784,736	1,988,072
Saudi Arabia	5,000,000	2,070,000
Sudan	5,000,000	—
Germany, Federal Republic of (DM8,000,000)	4,324,324	1,085,482
Ghana	2,500,000	1,500,000
Senegal	1,028,807	226,193
India	750,000	243,750
Thailand	500,000	100,000
Sweden	(231,215)	231,215
Holy See	(50,000)	50,000
<b>TOTAL:</b>	<b>US\$139,169,082</b>	<b>US\$91,494,712</b>

\* Pledges are payable over a period of normally five years. A few countries have made pledges in convertible currencies other than U.S. dollars, and as payments are received during the course of the year, the University's financial statements are adjusted to reflect the dollar equivalents at the end of each year.

## Operating Contributions and Project Support from Governments as of 15 December 1979

Austria	US\$300,400	January & October 1977
	72,000	September & November 1978
	112,470	June & September 1979
Sweden	208,877	November 1977
	114,155	February 1979
Norway	180,018	April 1976
	189,251	May 1977
	194,780	February 1978
	196,715	November 1979
Switzerland	171,717	Pledged February 1978; paid \$113,287
Netherlands	100,000	July 1976
	100,000	July 1977
	100,000	December 1978
Zaire	100,000	July 1977
Libyan Arab Jamahiriya	50,000	December 1976
	50,000	February 1977
	50,000	Pledged August 1977
	25,000	Pledged September 1978
	25,000	Pledged September 1979
Philippines	50,000	Pledged June 1978; paid \$20,000
Nigeria	50,000	Pledged December 1978; paid \$10,000
Greece	20,000	January 1976
	20,000	December 1977
	25,000	July 1978
	30,000	June 1979
Senegal	22,087	January 1975
	24,006	July 1978
United Republic of Tanzania	20,000	Pledged February 1979
Ghana	29,540	May & November 1975
	14,790	June 1977
Malaysia	10,000	July 1978
	10,000	March 1979
Tunisia	5,183	September 1978
	5,183	June 1979
Chile	5,000	March 1979
Sri Lanka	5,000	Pledged November 1979
Ethiopia	2,000	July 1979
Cyprus	1,292	June 1978
<b>TOTAL</b>	<b>US\$2,689,464*</b>	

\* Pledged and/or paid. Actual contributions received amount to US\$2,436,034.

Tanaskovic, Chairman of the Council, participated in the University Consultative Meetings, held in March 1979 in Accra and Nairobi, where the question of contributions to the University was discussed with a number of governments.

Dr. Abdelsalam Majali, Council member, accompanied the Vice-Rector for Planning and Development on a fund-raising mission to Kuwait and Iraq in October 1978. His participation proved to be extremely valuable in establishing high-level contacts with government officials.

During the period under review, the Planning and Development Division, in co-operation with the programme and other divisions of the University, evolved specific fund-raising strategies for various regions of the world. The Division also helped draw up a medium-term budgetary plan for the University. The basic premise is that the University has reached a level at which, without major growth in administrative costs, it is possible to further develop the programme activities throughout the world if adequate funds are obtained. While the long-term goal for the Endowment Fund still remains at US\$500 million, the University could confidently continue on a steady course of programme development, provided that pledges and contributions to the Endowment Fund reach a level of approximately half the US\$500 million goal by the mid-1980s.

To mobilize the full co-operation and support of the embassies of various countries located in Tokyo and the Permanent Missions to the United Nations in New York, the

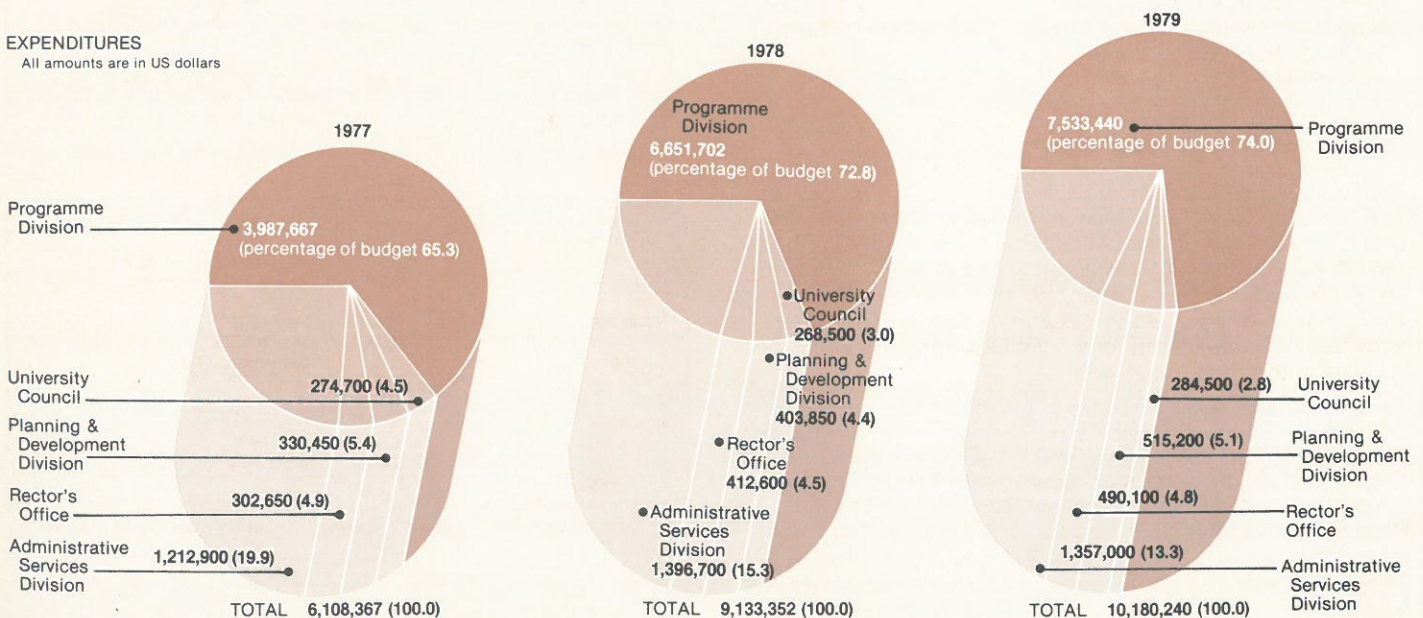
Planning and Development Division has organized comprehensive briefing sessions for embassy officials; similar briefings have been held, both individually and collectively, for members of a number of missions to the United Nations. These briefings have proved to be very useful and will be continued.

It should be recalled that, unlike most United Nations organizations, the University is not financed by annual subventions from the General Assembly or Member States. Income is derived mainly from interest from an Endowment Fund which is a capital fund made up of voluntary contributions from Member States. The Endowment Fund has two parts: one for support of all the University's activities and the other, limited to support of activities concerning developing countries. In addition, the University receives annual operating contributions and project support.

The endowment fund concept provides stability for the planning and execution of the University's programme activities, ensures the objectivity of the University's research, and protects it from many pressures that might accompany other forms of funding. The University's Charter grants it autonomy within the framework of the United Nations, including full authority to allocate its funds as it deems appropriate for its programme activities. Its financial administration is conducted within the rules and regulations of the United Nations, and its funds are audited by the United Nations Board of Auditors.

#### EXPENDITURES

All amounts are in US dollars



# ADVISORY COMMITTEE MEMBERS AND PROGRAMME CO-ORDINATORS

## World Hunger Programme

### Members of the Advisory Committee

- \* Dr. Guillermo Arroyave, Interregional Co-ordinator for Western Hemisphere and UNU Resident Co-ordinator
- Dr. Moisés Béhar, Chief, Nutrition Unit, World Health Organization, Geneva, Switzerland
- Mr. Sol H. Chafkin, Division of National Affairs and Social Development, The Ford Foundation, New York, USA
- Dr. Freda Chale, Nutrition Officer (Field Programme), Food Policy and Nutrition Division, Food and Agriculture Organization, Rome, Italy
- Dr. Wenche Barth Eide, Institute for Nutrition Research, School of Medicine, University of Oslo, Oslo, Norway
- Dr. Yujiro Hayami, Faculty of Economics, Tokyo Metropolitan University, Tokyo, Japan
- Dr. Hou Hsiang-Chuan, Institute Professor and Adviser, Department of Nutrition, Institute of Nutrition and Public Health, Shanghai, People's Republic of China
- Dr. Morgens Jul, Professor of Food Preservation, Royal Veterinary and Agricultural University, Copenhagen, Denmark
- Dr. Paul Luhnven, Chief, Food and Nutrition Assessment Service, Food Policy and Nutrition Division, Food and Agriculture Organization, Rome, Italy
- Dr. H.A.B. Parpia, Senior Adviser, United Nations Conference on Science and Technology for Development, Research Development Centre, Agriculture Department, Food and Agriculture Organization, Rome, Italy
- Dr. D. Picou, East Caribbean Medical Scheme, University of the West Indies General Hospital, Trinidad, West Indies
- \* Dr. Fred T. Sai, Interregional Co-ordinator for Africa, Middle East, and Europe
- Prof. Tasho A. Tashev, Institute of Nutrition, Sofia, Bulgaria
- Dr. Roger G. Whitehead, Director, Dunn Nutritional Laboratory, University of Cambridge and Medical Research Council, Cambridge, UK

### Co-ordinators

- Dr. Guillermo Arroyave, UNU Resident Co-ordinator, UNU-WHP Interregional Co-ordinator for Western Hemisphere, Institute of Nutrition of Central America and Panama, Guatemala City, Guatemala
- Dr. J. C. Dillon, UNU Resident Co-ordinator, Centre for Research in Nutrition, Laval University, Quebec, Canada
- Dr. Rodolfo Florentino, UNU Resident Co-ordinator, Nutrition Center of the Philippines, Makati, Philippines
- Dr. Miguel Layrissa, UNU Resident Co-ordinator, Venezuelan Institute for Scientific Research, Caracas, Venezuela
- Dr. Shinji Matsuura, UNU Resident Co-ordinator, National Food Research Institute, Tsukuba, Japan
- Dr. C.P. Natarajan, UNU Resident Co-ordinator, Central Food Technological Research Institute, Mysore, India
- Dr. R. Orraca-Tetteh, UNU Resident Co-ordinator, Department of Nutrition and Food Science, University of Ghana, Legon, Ghana
- Dr. Fred T. Sai, UNU-WHP Interregional Co-ordinator for Africa, Middle East and Europe, Institute of Statistical, Social and Economic Research, University of Ghana, Legon, Ghana
- Dr. E.M. Thain, UNU Resident Co-ordinator, Tropical Products Institute, London, UK
- Dr. Ricardo Uauy, UNU Resident Co-ordinator, Institute of Nutrition and Food Technology, University of Chile, Santiago, Chile
- Dr. Barbara Underwood, UNU Resident Co-ordinator, Programme Assistant to the Senior Adviser of WHP, the International Food and Nutrition Policy Program, Massachusetts Institute of Technology and the Harvard School of Public Health, Cambridge, Massachusetts, USA

\* Ex-officio member

## Human and Social Development Programme

### Members of the Advisory Committee

- \* Dr. Anouar Abdel-Malek, Project Co-ordinator
- Dr. Samir Amin, Director, African Institute for Economic Development and Planning, Dakar, Senegal
- Dr. Elise Boulding, Professor, Dartmouth College, Hanover, New Hampshire, USA
- Dr. Celso Furtado, Professor of Economic Development, University of Paris, Paris, France
- \* Dr. Johan Galtung, Project Co-ordinator
- Dr. Hab. J.W. Golebiowski, Professor and Director, Labour Institute, Warsaw University, Warsaw, Poland
- Dr. Manuel Perez Guerrero, State Minister in Charge of International Economic Affairs, Caracas, Venezuela
- \* Dr. Takeshi Hayashi, Project Co-ordinator
- \* Dr. Amilcar Herrera, Project Co-ordinator
- Dr. J. Ki-Zerbo, former Director of Education, National Ministry of Education, Ouagadougou, Upper Volta
- Dr. Rajni Kothari, President, Indian Council of Social Science Research, New Delhi, India
- Dr. Michio Nagai, Professor of Education, International College, Sophia University, Tokyo, Japan; former Minister of Education, Japan
- Dr. K. Soedjatmoko, Adviser, National Development Planning Agency, Republic of Indonesia, Jakarta, Indonesia
- \* Mr. Chandra Soysa, Project Co-ordinator
- Dr. Rodolfo Stavenhagen, El Colegio de Mexico, Mexico City, Mexico
- Dr. Alain Touraine, Institute of Human Sciences, National Centre of Scientific Research, Paris, France

### Co-ordinators

- Dr. Anouar Abdel-Malek, Project Co-ordinator for the Project on Socio-Cultural Development Alternatives in a Changing World, Institute of Human Sciences, National Centre of Scientific Research, Paris, France
- Dr. Johan Galtung, Project Co-ordinator for the Project on Goals, Processes and Indicators of Development, c/o UNITAR Office in Geneva, Geneva, Switzerland
- Dr. Takeshi Hayashi, Project Co-ordinator for the Project on Technology Transfer, Transformation, and Development: The Japanese Experience, Research Planning and Co-ordinating Office, Institute of Developing Economies, Tokyo, Japan
- Dr. Amilcar Herrera, Project Co-ordinator for the Project on Research and Development Systems in Rural Settings, State University of Campinas, Campinas, São Paulo, Brazil
- Mr. Chandra Soysa, Project Co-ordinator for the Project on Sharing of Traditional Technology, Marga Institute, Colombo, Sri Lanka

# UNIVERSITY STAFF

## Programme on the Use and Management of Natural Resources

### Members of the Advisory Committee

- \* Dr. Eric Bird, Project Co-ordinator  
Mrs. Margaret Biswas, International Institute for Applied Systems Analysis, Laxenburg, Austria
- \* Dr. Gerardo Budowski, Project Co-ordinator  
Dr. James M. Harrison, Adviser and Consultant, former Assistant Deputy Minister, Department of Energy, Mines and Resources, Canada, and former Assistant Director-General, Programme on Science and Technology, UNESCO, Ottawa, Canada  
Dr. Carl-Göran Héden, International Federation of Institutes for Advanced Study, Solna, Sweden
- \* Dr. Jack D. Ives, Project Co-ordinator  
Dr. I. Kobori, Professor, Faculty of Science, University of Tokyo, Tokyo, Japan  
Dr. F.O. Kwami, Dean, Faculty of Engineering, University of Science and Technology, Kumasi, Ghana
- \* Dr. Maurice Lévy, Project Co-ordinator
- \* Dr. Jack A. Mabbutt, Project Co-ordinator
- \* Dr. G.J. Afolabi Ojo, Project Co-ordinator
- \* Dr. Kenneth Ruddle, Project Co-ordinator  
Dr. Sanga Sabhasri, Secretary-General, National Research Council of Thailand, Bangkok, Thailand  
Dr. Didin S. Sastrapradja, Deputy Chairman for Natural Resources, Indonesian Institute of Sciences, Jakarta, Indonesia  
Dr. Gilbert F. White, former Director, Institute of Behavioral Science, University of Colorado, Boulder, Colorado, USA  
Dr. Michael J. Wise, Professor, London School of Economics and Political Sciences, London, UK

### Co-ordinators

- Dr. Eric Bird, Project Co-ordinator for the Project on Coastal Zone Management, Department of Geography, University of Melbourne, Parkville, Victoria, Australia
- Dr. Gerardo Budowski, Project Co-ordinator for the Project on Agro-Forestry Systems, Head, Natural Renewable Resources Programme, Tropical Agricultural Research and Training Center, Turrialba, Costa Rica
- Dr. Jack D. Ives, Project Co-ordinator for the Project on Highland-Lowland Interactive Systems, Director, Institute for Arctic and Alpine Research, University of Colorado, Boulder, Colorado, USA
- Dr. Maurice Lévy, Project Co-ordinator for the Project on Energy for Rural Communities, Laboratory of Theoretical and High Energy Physics, Pierre and Marie Curie University, Paris, France
- Dr. Jack A. Mabbutt, Project Co-ordinator for the Project on Assessment of the Application of Knowledge to Arid Lands Problems, The University of New South Wales, Sydney, Australia
- Dr. G.J. Afolabi Ojo, Project Co-ordinator for the Project on Rural Energy Systems, Department of Geography, University of Ife, Ife-Ife, Nigeria
- Dr. Kenneth Ruddle, Project Co-ordinator for the Project on Water-Land Interactive Systems and Consultant, Research Associate, National Museum of Ethnology, Osaka, Japan



Dr. Hester Dr. Kwapong Dr. Mushakoji Dr. Manshard Dr. Scrimshaw

### Office of the Rector

- Dr. James M. Hester, Rector
- Dr. Michio Nagai, Senior Adviser to the Rector
- Dr. Jose Abueva, Secretary of the University
- Mr. Jose Mata, Special Assistant

### Planning and Development

- Dr. Alexander A. Kwapong, Vice-Rector
- Mr. S. Chidambaranathan, Senior Governmental and Institutional Relations Officer
- Mr. Vagn Kjellberg, Governmental and Institutional Relations Officer

### World Hunger Programme

- Dr. Nevin S. Scrimshaw, Senior Adviser to the Rector
- Dr. Maria A. Tagle, Senior Programme Officer
- Mrs. Rozanne Chorlton, Assistant Programme Officer
- Dr. William Rand, Research Co-ordinator

### Human and Social Development Programme

- Dr. Kinhide Mushakoji, Vice-Rector
- Dr. Ponna Wignaraja, Senior Programme Officer
- Dr. Pedro Henriquez, Programme Officer
- Dr. Hossam Issa, Programme Officer

### Programme on the Use and Management of Natural Resources

- Dr. Walther Manshard, Vice-Rector
- Dr. Richard S. Odingo, Senior Programme Officer
- Dr. Walter C. Shearer, Programme Officer
- Mr. Lee H. MacDonald, Assistant Programme Officer

### Academic Services

- Mr. Shigeo Minowa, Chief

### Information Services

- Mr. R.A. Fleming, Director

### Administrative Services Division

- Mr. Douglas T. Manson, Director of Administration
- Dr. Zdenek Seiner, Legal Counsel
- Mr. Akio Komatsuki, Chief of Finance and Japanese Government Liaison Officer

### New York Liaison Office

- Mr. Hironobu Shibuya, Chief, Liaison Office, United Nations Headquarters

### Information Office for Europe

- Mr. C.T. Isolani, Representative, United Nations Information Centre, London

## ASSOCIATED INSTITUTIONS

### WH WORLD HUNGER PROGRAMME

Central Food Technological Research Institute, Mysore, India  
Centre for Research in Nutrition, Laval University, Quebec, Canada  
Department of Nutrition and Food Science, University of Ghana, Legon, Ghana  
Institute of Nutrition of Central America and Panama, Guatemala City, Guatemala  
Institute of Nutrition and Food Technology, University of Chile, Santiago, Chile  
International Food and Nutrition Policy Program, Massachusetts Institute of Technology and the Harvard School of Public Health, Cambridge, Mass., USA  
Nutrition Center of the Philippines, Makati, Philippines  
Tropical Products Institute, London, UK  
Venezuelan Institute for Scientific Research, Caracas, Venezuela

### HSD HUMAN AND SOCIAL DEVELOPMENT PROGRAMME

El Colegio de Mexico, Mexico City, Mexico  
Institute of Developing Economies, Tokyo, Japan  
Institute of Development Studies, Geneva, Switzerland  
Marga Institute, Colombo, Sri Lanka  
The Latin American Faculty of Social Sciences (FLACSO), Mexico City, Mexico

### NR PROGRAMME ON THE USE AND MANAGEMENT OF NATURAL RESOURCES

Bogor Agricultural University, Bogor, Indonesia  
Chiang Mai University, Chiang Mai, Thailand  
National Energy Authority, Reykjavik, Iceland  
National Organization for Scientific Research, Algiers, Algeria  
Tropical Agricultural Research and Training Centre, Turrialba, Costa Rica  
University of Colorado, Boulder, Colorado, USA  
University of Ife, Ife-Ife, Nigeria  
University of Khartoum, Khartoum, the Sudan  
University of New South Wales, Sydney, Australia  
**Projected**  
Academia Sinica, Beijing, People's Republic of China  
Institute for Animal Nutrition Research, Wageningen, Netherlands  
(jointly with World Hunger Programme)

## RESEARCH AND TRAINING UNITS

Research and training units of the University are based at the following institutions:

### WH WORLD HUNGER PROGRAMME

National Food Research Institute, Tsukuba, Japan

### HSD HUMAN AND SOCIAL DEVELOPMENT PROGRAMME

**Project on Goals, Processes, and Indicators of Development**  
Institute of Development Studies, Geneva, Switzerland (co-ordinating institution)  
African Institute for Economic Development and Planning, Dakar, Senegal  
Bariloche Foundation, San Carlos de Bariloche, Argentina  
Bureau of Resource Assessment and Land Use Planning, University of Dar-es-Salaam, Dar-es-Salaam, Tanzania  
Centre for Policy Research, University of Science Malaysia, Penang, Malaysia  
Center for the Study of Developing Societies, New Delhi, India  
Chair in Conflict and Peace Research, University of Oslo, Oslo, Norway  
Committee "Poland Year 2000," Polish Academy of Science, Warsaw, Poland  
Department of Extension Studies, University of Papua New Guinea, Port Moresby, Papua New Guinea  
Department of Sociology, University of Auckland, Auckland, New Zealand  
Division of Systems Studies, University of Bucharest, Bucharest, Romania  
El Colegio de Mexico, Mexico City, Mexico  
GAMMA, University of Montreal, Montreal, Canada  
Institute for Peace Science, Hiroshima University, Hiroshima, Japan  
Institute of International Relations, University of the West Indies, Kingston, Jamaica  
International Institute for Environment and Society, Science Centre Berlin, Berlin (West)  
Marga Institute, Colombo, Sri Lanka  
Mershon Center, Ohio State University, Columbus, Ohio, USA  
Peace Research Institute, Sweden, Göteborg, Sweden  
Project Group "Development and Underdevelopment/World Economy," Max Planck Institute, Starnberg, Federal Republic of Germany  
Science Policy Research Unit, University of Sussex, Brighton, UK  
Society for International Development, Rome, Italy  
Union of International Associations, Brussels, Belgium  
United Nations Institute for Training and Research (UNITAR), Geneva, Switzerland  
World Future Studies Federation, Rome, Italy  
**Project on Socio-Cultural Development Alternatives in a Changing World**  
National Centre of Scientific Research, Paris, France (co-ordinating institution)  
Caribbean Development and Co-operation Committee, Port of Spain, Trinidad and Tobago  
Centre for East Asian Studies, McGill University, Montreal, Canada  
Centre for Economic and Social Research and Studies, University of Tunis, Tunisia  
Centre for Political Studies, School of Social Sciences, Jawaharlal Nehru University, New Delhi, India

Centre for the Study of the Practices and Representations of Socio-Economic Changes, University of Grenoble, Grenoble, France  
Department of Bengali, University of Chittagong, Chittagong, Bangladesh  
Department of Political and Social Sciences, Complutensian University of Madrid, Madrid, Spain  
Department of Social Anthropology, University of Cambridge, Cambridge, UK  
Department of Sociology, University of Auckland, Auckland, New Zealand  
Department of Sociology, University of Ibadan, Ibadan, Nigeria  
East Asian History of Science Library, University of Cambridge, Cambridge, UK  
Faculty of Social Sciences, University of Warsaw, Warsaw, Poland  
Fernand Braudel Center for the Study of Economics, Historical Systems and Civilizations, State University of New York at Binghamton, Binghamton, USA  
Institute for Peace Science, Hiroshima University, Hiroshima, Japan  
Institute of Arab Research and Studies, Cairo, Egypt  
Institute of International Relations for Advanced Studies on Peace and Development in Asia, Sophia University, Tokyo, Japan  
Institute of Pacific Studies, The University of the South Pacific, Suva, Fiji  
Institute of Peruvian Studies, Lima, Peru  
Thai Khadi Research Institute, Thammasat University, Bangkok, Thailand  
**Project on Research and Development Systems in Rural Settings**  
Latin American Faculty of Social Sciences (FLASCO), Mexico City, Mexico, (co-ordinating institution)  
Economic Development Foundation, Rizal, Philippines  
Ethiopian Science and Technology Commission, Addis Ababa, Ethiopia  
Institute for Studies of Rural Development "Maya A.C.," Mexico City, Mexico  
State University of Campinas, São Paulo, Brazil  
**Project on Sharing of Traditional Technology**  
Marga Institute, Colombo, Sri Lanka (co-ordinating institution)  
Consumers Association of Penang, Penang, Malaysia  
Development Research and Communication Group, Kathmandu, Nepal  
Dian Desa, Yogyakarta, Indonesia  
Gakushuin University, Tokyo, Japan  
Institute of Philippine Culture, Quezon City, Philippines  
Thai Khadi Research Institute, Thammasat University, Bangkok, Thailand  
**Project on Technology Transfer, Transformation, and Development: The Japanese Experience**  
Institute of Developing Economies, Tokyo, Japan (co-ordinating institution)  
Bunkyo Women's College, Tokyo  
Department of Agriculture, University of Tokyo, Tokyo  
Department of Engineering, Tokyo Institute of Technology, Tokyo  
Department of Humanities, Tsukuba University, Tsukuba  
Department of Law and Economics, Aichi University, Toyohashi  
Faculty of Arts, Rikkyo University Tokyo  
Faculty of Arts, Hanazono University, Kyoto  
Faculty of Commerce and Economics, Senshu University, Tokyo  
Faculty of Commerce, Hitotsubashi University, Tokyo  
Faculty of Economics, Hosei University, Tokyo

Faculty of Economics, Kanazawa College of Economics, Kanazawa  
Faculty of Economics, Toyo University, Tokyo  
Faculty of Education, Niigata University, Niigata  
Faculty of Humanities, Ibaragi University, Mito  
Faculty of Law and Letters, Kanazawa University, Kanazawa  
Faculty of Political Science and Economics, Hiroshima University, Hiroshima  
Faculty of Social Sciences and Humanities, Tokyo Metropolitan University, Tokyo  
Faculty of Sociology, Hitotsubashi University, Tokyo  
Faculty of Sociology, Kansai University, Osaka  
Faculty of Technology, Toyo University, Tokyo  
Institute of Economic Research, Hitotsubashi University, Tokyo  
Japan Export Metal Flatware Industry Association, Tsubame  
Land Utilization Section, Department of Farm Management and Land Utilization, National Institute of Agricultural Sciences, Tokyo  
Mitsui Research Institute for Social and Economic History, Tokyo  
Niizu High School, Niizu  
Nuttari High School, Nuttari  
Office of Policy Formation, Tokyo Metropolitan Government, Tokyo  
Planning Division, Planning and Co-ordination Bureau, National Land Agency, Tokyo  
Sanjo City Library, Sanjo  
Sendai Dai-ichi High School, Sendai  
Toei Ironware Co. Ltd., Sanjo  
Tokyo Gakugei University, Tokyo  
Tsubame High School, Tsubame  
Tsubame Industrial High School, Tsubame  
Wako University, Tokyo

### NR PROGRAMME ON THE USE AND MANAGEMENT OF NATURAL RESOURCES

International Institute for Aerial Survey and Earth Sciences, Enschede, Netherlands  
National Institute of Oceanology of the Indonesian Institute of Sciences, Jakarta, Indonesia  
National Institute of Science and Technology, Manila, Philippines  
National Planning Commission, Kathmandu, Nepal  
University of Papua New Guinea, Port Moresby, Papua New Guinea  
University of Swansea, Swansea, UK  
Wau Ecology Institute, Wau, Papua New Guinea  
**Projected**  
Agricultural University, La Molina, Lima, Peru  
Autonomous Agricultural University "Antonio Narro," Saltillo, Mexico  
Central Arid Zone Research Institute, Jodhpur, India  
Chung-Ang University, Seoul, Republic of Korea  
East-West Center, Honolulu, Hawaii, USA  
Kagoshima University, Kagoshima, Japan  
Southeast Asian Fisheries Development Center, Manila, Philippines  
Tanzania National Scientific Research Council, Dar-es-Salaam, Tanzania  
University of Campinas, Campinas, Brazil  
University of Hamburg, Hamburg, Federal Republic of Germany  
University of Kyushu, Fukuoka, Japan  
University of Malaya, Kuala Lumpur, Malaysia



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