INTERNATIONAL FOUNDATION FOR SCIENCE

IFS WORK 1974 - 1983

RURAL TECHNOLOGY

The International Foundation for Science, a non-governmental, non-profit organization, is established to promote and support in developing regions of the world meritorious research in the fields of the natural and social sciences and in technology.

The Foundation will provide young scientists and technologists of outstanding merit from developing countries with financial and other support in their work.

A condition is that the research activity shall take place in the territory of a developing country.

INTERNATIONAL
FOUNDATION
FOR SCIENCE

GREV TUREGATAN 19
S-114 38 STOCKHOLM
SWEDEN

FOREWORD

By 1972, the year the International Foundation for Science was founded, scientists, academics, and policy makers interested in development aid had long recognized the difficult situation faced by young scientists from developing countries. Research opportunities did not exist in their countries, or if they did, they were reserved for senior and well-established researchers.

The need for an organization that could enable young scientists to pursue a career of research in their homelands was clear, and in 1972 Sweden and Canada provided the initial funds to establish such an organization, the IFS. Since then France, the Federal Republic of Germany, the Netherlands, Belgium, Norway, Switzerland, Nigeria, the United States, Australia and UNESCO have joined as donors of the Foundation. Member Organizations--scientific academies, research councils, and royal societies--from 65 countries advise the IFS on policy and promote its activities.

In the past ten years the IFS has awarded grants to nearly 800 scientists in 78 developing countries for research within a granting programme that includes Aquaculture, Animal Production, Food Crops, Afforestation and Mycorrhiza, Fermentation and Applied Microbiology, Natural Products, and Rural Technology. The grantees were selected based on the recommendations of the IFS Scientific Advisers, specialists in the IFS scientific areas who serve the IFS voluntarily and in a personal capacity.

The grants are modest (normally not more than USD 10 000) and can be awarded up to four times per grantee. Since the institute of the grantee provides a salary and facilities, IFS grants are devoted to purchasing the basic tools of research--equipment, expendable supplies, literature. Because grantees often face isolated and difficult conditions, because they are young and inexperienced, the IFS provides more than financial support.

Workshops are arranged on behalf of the grantees and are attended by IFS Scientific Advisers. These advisers provide guidance to grantees on such occasions, as well as by mail and visits to research sites.

The IFS was founded because there was no other organization providing this kind of support to developing countries. Today, ten years later, the IFS is still unique among organizations. This was the conclusion reached by a 1981-82 evaluation of the

FOREWORD

IFS commissioned by the IFS Sponsors and conducted by an external panel headed by Dr Francisco Sagasti of Peru and Prof Geoffrey Oldham of the United Kingdom. The panel also concluded that the IFS had succeeded in reaching the intended target group of young and well-educated scientists and had provided them with research opportunities in their own countries that would not otherwise have been available. The panel was satisfied with the selection of grantees and the quality and relevance of the research done by these scientists.

The panel made a number of recommendations for future activities. The proportion of grants given to scientists in Latin America and Africa should be increased in order to balance the geographic distribution between these continents and Asia. Because of the importance of the IFS Scientific Advisers to the success of the IFS activities, their number should be increased. The Foundation has implemented both of these recommendations.

The most important recommendation was that the IFS increase the scope of its activities. The need for such an increase is reflected by the number of applications received by the Foundation. Today the IFS is able to provide support for only one out of every three applicants. The IFS is making concerted efforts to seek additional funds that such a recommendation, and such a need, imply.

Gordon Butler
President

GUIDE TO IFS WORK
RURAL TECHNOLOGY

This report is a chapter of the IFS WORK, which includes chapters of all the scientific areas of the IFS granting programme: A, Aquaculture; B, Animal Production; C, Food Crops; D, Afforestation and Mycorrhiza; E, Fermentation and Applied Microbiology; F, Natural Products; G, Rural Technology. These other chapters have also been printed individually and are available from the IFS Secretariat.

The chapter RURAL TECHNOLOGY presents in numerical order the names and institutions of grantees who have received grants in this scientific area during the years 1974 - 1983. The title, a short summary, and subject descriptors (taken from the OECD MACROTHESAURUS; those not found in the OECD publication are preceded by asterisks ***) are included as well as the amount of funding provided by the IFS. These amounts are given in SEK, Swedish Crowns. The funding dates coincide with the year of the award. Completed projects are indicated by a date; when no such date appears, the project is active as of 1983.

A brief introduction of the scientific area was written by the IFS Scientific Secretary Dr Lennart Prage. There are two indexes: one by subject descriptor, the other by country.

The summaries of the projects were written at the IFS Secretariat and submitted to the grantees for their approval.

The information contained in the IFS WORK is part of a database created for sharing project information, the International Development Research Information System (IDRIS). The system, in the pilot project stage, is being hosted by the International Development Research Centre (IDRC) of Canada. The database is stored in the Centre's minicomputer, which uses MINISIS software. MINISIS processors were used to extract the information for the printing of the IFS WORK.

Ms Judith Furberg, Information Secretary, was responsible for the compilation and editing of the IFS WORK 1974 - 1983.

RURAL TECHNOLOGY

The development of technologies specifically adapted to the needs of rural areas in developing countries can reduce or eliminate the discomforts in which their inhabitants live and work. Such technologies should as far as possible make use of locally-available materials in order to minimize the dependence and cost of transportation and importation. The research usually aims at solving local problems; cultural and socio-economic factors need to be considered in order to produce usable results.

Since the great majority of developing countries' populations live in rural areas, it is of great importance that conditions be improved. Better housing, working places, sanitation, and agricultural production can be developed by the research efforts of chemists, physicists, engineers, geologists, and other scientists. Scientific investigation of traditional techniques and of the use of locally-available raw materials can result in improved methods for the production of energy, building materials, tools, chemicals, drinkable water, and food. They can also promote the creation of a healthy environment.

Projects supported within Rural Technology must be scientifically oriented and measure up to national and international scientific standards. Projects should be original and innovative and not merely a transfer of technology.

The IFS began supporting such research in 1979 and has awarded grants to 31 researchers. About half of these are working on energy production suitable to rural areas and utilizing local biofuels. Four grantees are studying the technology of producer gas production using fuels like coconut shells, bagasse, and other agricultural wastes. Two grantees are investigating technological problems in biogas production, and another the design and efficiency of locally-made stoves. Some 7 grantees are developing methods to dry various products with the help of solar energy. These studies have involved drying technology of such diverse products as fish, onions, fruit, rubber, and timber. One researcher has been looking into the possibility of using solar energy to run a water circulation system for fish culture and water plant farming.

A number of grantees are studying the potential use of locally-available materials for construction purposes. They investigate the suitability of tree and plant materials for roofing and insulation, and also brickmaking using local clays. One grantee

Previous Page Blank

RURAL TECHNOLOGY

has studied the making of concrete, using local materials to retard the setting and entrain air in a hot climate. Two grantees have been characterising little known and underutilized wood species which are normally discarded as wastes. Based on such research these materials can be used for construction, artisan work, or other useful purposes.

Technology related to the other six IFS research subject areas has also been supported. Research on hydrology, the construction of greenhouses and poultry houses, beehives, and the design of cheap equipment for oil extraction is supported. One grantee has studied the water quality in a local river to evaluate the suitability for fishery management, consumption and irrigation.

This area is the smallest and most recently supported in the IFS granting programme, but is expected to grow. There is an increasing need for the characterisation of various natural materials for technology purposes to improve living standards in rural areas and to meet the demand of local industries. This research is the work of chemists, engineers, geologist and physicists. Scientific investigation on traditional methods can also result in improved or new technology.

Research on environmental conditions is also crucial for developing countries. Studies on water conditions and the quality of water is of great importance and involves both geological and hydrological research.

Geographically, of the 31 grantees 15 are located in Asia, 12 in Africa and 4 in Latin America.

RURAL TECHNOLOGY

Grantee G004: Dr Oumar Diallo, Département de Physique, Faculté des Sciences, Université de Dakar, DAKAR-FANN, Senegal

"Improved sun-drying of fish"

IFS funding: 16200 SEK 1974 Completed 1979

Dr Diallo is studying the construction of improved ovens for sun-drying fish. Fish is an important source of animal protein in Senegal, but the traditional methods of fish-drying lead to considerable losses in quantity and quality of the sun-dried fish. Improved processing methods are urgently required.

/solar energy/ /drying/ /fish preservation/

Grantee G132: Mr Sudjana Rusman, National Institute for Chemistry, Jalan Cisitu Sangkuriang, BANDUNG, Indonesia

"Development of a cheap, simple and effective artificial dryer for onions"

IFS funding: 24200 SEK 1976 20425 SEK 1979

An efficient method for onion preservation is necessary to avoid storage losses. Sun drying is still the prevalent method, especially in the Java region, where onion production is important. This method is, however, limited to the dry season, and does not allow for satisfactory control. Mr Rusman will try to develop a simple and cheap onion dryer to be made locally. A thorough investigation of drying characteristics, e.g., moisture content, air humidity, drying time, temperature, will be carried out, as well as an evaluation of the dried product as to texture, colour, flavour, package and storage life.

/drying/ /food preservation/ /onions/

RURAL TECHNOLOGY

Grantee G259: Dr Mohamed Siddiqueullah, Jutton Project, BCSIR, Mirpur Road, Dhanmondi, DACCA-5, Bangladesh

"Corrugated roofing board from jutestick for rural houses"

IFS funding: 28200 SEK 1978

Most rural houses in Bangladesh have thatched roofs, which last for one or two years. Corrugated iron sheets are expensive, and to provide an alternative roof material, Dr Siddiqueullah will use jutestick, a waste product from jute cultivation, to produce low-cost building material. Most of the jutestick is used as domestic fuel. Mechanical-chemical methods will be used to make jutestick pulp that will be processed into corrugated boards. To establish a method to produce boards of good quality, various experiments will be made, e.g., on selection of resin that will give the best results. The board will also be exposed to natural weathering to determine the durability of the boards.

/construction materials/ /jute/

Grantee G360: Dr Isaac Okoh, Forest Products Research Institute, The Council for Scientific and Industrial Research, (CSIR), P O Box 63, KUMASI, Ghana

"Solar drying of timber in Ghana - development of low-cost technology for rural and agricultural construction"

IFS funding: 25400 SEK 1979

A problem for wood utilization in Ghana is the lack of efficient lumber drying facilities. Air drying is inexpensive but takes much time; kiln dryers are efficient, but expensive to install and operate. Dr Okoh will investigate the feasability of using solar energy for lumber drying. The effect of different materials on the efficiency of the solar dryer will be determined as well as absorption and heat losses. The drying capacity of the chosen dryer model will be determined in terms of drying rate and cost. The results will be compared with those obtained by the drying methods used at present, such as steam heated kilns and air drying.

/solar energy/ /drying/ /timber/

RURAL TECHNOLOGY

Grantee G399: Mr Nidoua Savadogo, Institut Supérieur Polytechnique, Université de Ouagadougou, B P 7021, OUAGADOUGOU, Upper Volta

"Methods for hydrological investigations in Upper Volta"

IFS funding: 30100 SEK 1979

As a result of the drought in recent years in the Sahel countries, the number of wells has increased. The knowledge of the amount of available groundwater and its renewal is very incomplete. Isotope analyses in Upper Volta have demonstrated the existence of fossil underground water. Mr. Savadogo will develop suitable methods of studying the water infiltration and the groundwater levels with relation to the various geological and geomorphological features of the region. The purpose is to determine available groundwater resources, both renewable and fossil ones, as a basis for rational water use.

/hydrogeology/ /groundwater/

Grantee G401: Mr Paisan Wuttijumnong, Department of Agro-Industry, Faculty of Natural Resources, Prince of Songkla University, HAAD YAI, Thailand

"Development of a solar dryer for marine product drying at Tambon Kaosan village"

IFS funding: 21500 SEK 1979

Marine products in Southern Thailand are usually salted and dried. Traditionally, fish are dried on bamboo mats; the quality of the product is usually low because of chemical changes and contamination from flies. Mr Paisan Wuttijumnong will design small-scale solar dryers made of locally-available material. The best type for fish drying will be developed and further quality tests will be made on the dried products. The dryer will then be demonstrated to local fisherman for more extensive utilization.

/solar energy/ /drying/ /fish preservation/

RURAL TECHNOLOGY

Grantee G402: Mr Víctor Carrasco N, Conferencia Episcopal Boliviana, Secretariado Nacional de Estudios y Acción Social, Casilia 4349, LA PAZ, Bolivia

"Design of greenhouses suitable for the altiplano in Bolivia"

IFS funding: 21500 SEK 1979 Completed 1983 50000 SEK 1981

The cold and dry climate of the Bolivian highlands is favourable for agriculture. Many crops need to be acclimatized, and for this purpose Mr Carrasco will design simple greenhouses made of different kinds of cheap building material. Natural sources of energy for light and heating will be investigated and economically evaluated. The best type of greenhouse will be further tried to better suit agricultural needs.

/greenhouses/

Grantee G444: Dr Dhammika de Silva, Wood and Cellulose Technology Section, Ceylon Institute of Scientific and Industrial Research, (CISIR), P O Box 787, COLOMBO 7, Sri Lanka

"Designs of stoves to utilize wood charcoal for domestic cooking"

IFS funding: 16600 SEK 1980 45750 SEK 1982 31000 SEK 1981

Increased kerosene oil prices have forced consumers to use firewood and charcoal for domestic cooking. The price of firewood tends to rise with kerosene and diesel fuel prices, as much of the cost is due to transport. Charcoal with its more moderate cost and smokeless burning qualities is a viable alternative to the traditional fuels. Charcoal has never been utilized for domestic cooking in Sri Lanka. Therefore, success will depend to a great extent on the stove. Dr de Silva will improve the basic design of charcoal stoves. Besides being durable, cheap and simple to operate, they should preferably have a heat transfer rate above 30% and provisions for heat regulation.

/stoves/ /charcoal/

RURAL TECHNOLOGY

Grantee G493: Dr Lee Cherl-Ho, Department of Food Technology, College of Agriculture, Korea University, 1 Anamdong, Sungbuk-ku, SEOUL, 132, Republic of Korea

"Development of a low-cost food dehydration system using solar energy and coal for food preservation in Korean villages"

IFS funding: 36080 SEK 1980 55100 SEK 1982
67500 SEK 1983 Completed 1982

Insufficient drying before storage is the major cause of crop losses in Korea. The conventional sun drying takes too long and is not efficient. Dr Lee will initiate this study by a survey of present food drying and storage practices on farms and then try to develop an improved drier. Different types of simple solar energy collectors and supplemental coal heaters will be tried. The drying characteristics of selected foods treated in the modified drier will also be studied.

/solar energy/ /drying/ /food preservation/

Grantee G494: Mr Nguyen Thuyen, Institut de Projet d'Architecture Rurale, Ministère de l'Agriculture, HANOI, Viet Nam

"Improvement of the micro-climate in poultry houses in hot and humid climates"

IFS funding: 35200 SEK 1980

A good micro-climate in poultry houses is essential to obtain reasonable productivity of eggs or broilers. Heat and humidity reduce the productivity considerably. The grantee will study the influence of the external climate on the micro-climate in traditional poultry houses and then try different methods to control the micro-climate, e.g., by isolation, reflecting roofing material, and improved ventilation systems. It is expected that standards for poultry houses can then be formulated to decrease chicken mortality due to climatic conditions.

/animal housing/ /poultry/

RURAL TECHNOLOGY

Grantee G495: Mr Rashad Maudarbocus, Sugar Industry Research Institute, REDUIT , Mauritius

"Testing bagasse for use as fuel for internal combustion engines"

IFS funding: 44000 SEK 1980

Mauritius depends on imported oil for most of its energy requirements. Bagasse is a by-product from the sugar industry, which can be used in combustion engines to provide energy. Mr Maudarbocus will install a pilot producer gas unit connected to an internal combustion engine. The conversion efficiency of the bagasse into producer gas will be studied, and the gas will be analysed as to moisture and combustible fraction. The efficiency of the installation will be assessed, and a cost/benefit analysis will be made. Attention will also be given to pollution aspects and health hazards in connection with the operation of the unit.

/fuels/

*** /producer gas/ /bagasse/

Grantee G496: Dr Naksitte Coovattanachai, Department of Mechanical Engineering, Faculty of Engineering, Prince of Songkla University, HAAD YAI, Thailand

"Producer gas as an alternative source of energy in Thailand"

IFS funding: 39600 SEK 1980 56000 SEK 1981
75000 SEK 1983

Energy shortage is a problem in Thailand, and the search for alternative energy sources is being intensified. Dr Naksitte Coovattanachai will try to develop the utilization of producer gas for mechanical work and electricity in rural areas. Various agricultural residues mixed with charcoal will be tried for fuel. Optimum moisture contents and size of the fuel will be investigated. Both gasoline and diesel engines will be used in the experiments.

/engine fuels/ /rural environment/

*** /producer gas/

RURAL TECHNOLOGY

Grantee G497: Mr Sumphorn Manodham, Comité d'Etat pour la Science et la Technique, B P 167, VIENTIANE, Lao People's Democratic Republic

"Utilization of producer gas"

IFS funding: 13200 SEK 1980 46400 SEK 1982

Laos is rich in forests, which provide an important source of energy. Transport of fossil fuels to this landlocked country is expensive and difficult. Mr Manodham will try charcoal, sawdust, and wood from different kinds of wood to run a producer gas unit connected to a vehicle motor. The type of fuel producing the best gas composition will be determined. An economic evaluation of the utilization of producer gas, especially in rural areas, will also be made.

/fuels/ /fuelwood/

*** /producer gas/

Grantee G498: Mr Philip Chong Seng, Seychelles Electricity Corporation Ltd., Unity House, P O Box 174, VICTORIA, Mahe, Seychelles

"Seychelles integrated energy project: biomass conversion as an energy source for the Outer Islands"

IFS funding: 44000 SEK 1980

Seychelles is composed of 92 islands; the distribution of the population is very uneven, partly because of a lack of energy. Mr Chong Seng will set up a gas unit to generate electricity or to power vehicles. Different locally-available fuels will be tested to define the quantities necessary for satisfactory operation of the unit. The availability of different kinds of fuel on different islands will also be investigated. After initial testing, the gas unit will be tried on chosen islands to verify its usefulness and to train local people to operate and maintain the unit. An economical evaluation of the operation will also be made.

/renewable energy sources/ /biomass/

*** /producer gas/

RURAL TECHNOLOGY

Grantee G539: Mr Felipe Vinluan Junior, Southern Mindanao Agricultural Research Center, University of Southern Mindanao, Kabacan, NORTH COTABATO 9311, Philippines

"Design and development of low-cost brickmaking machines and kilns for rural areas"

IFS funding: 45000 SEK 1981 Completed 1983

The shortage of building material in the Philippines has resulted in increased prices for wood products and other durable construction materials, which has had serious effects on housing in poor and remote areas of the country. Mr Vinluan Junior will try to develop a method to produce low-cost building materials for rural areas. A suitable non-energy intensive machine for making bricks from clay soil will be designed, as well as kilns and furnaces for baking the bricks. Locally-available fuels, such as rice hulls, coconut husks, and corn cobs will be tried to run the brick manufacturing units.

/construction materials/ /bricks/

Grantee G540: Mr Chukiat Kooptarnond, Department of Mechanical Engineering, Faculty of Engineering, Prince of Songkla University, HAAD YAI, Thailand

"Producer gas as fuel for agricultural machinery in Thailand"

IFS funding: 50000 SEK 1981

A large proportion of Thai export revenues comes from agricultural products. Farm mechanization is an important tool to increase the production. High oil prices make it necessary to search for alternative sources of energy. Mr Chukiat Kooptarnond will develop a system of utilizing producer gas to run agricultural machinery. Experiments will be carried out to study the performance of these machines when run with producer gas units. Modifications of the units and the engines will be made in order to optimize the results. IFS is already supporting a project (No grantee No G496) at the same university, which tries different types of fuel; these two projects are carried out in close cooperation.

/engine fuels/ /agricultural machinery/

*** /producer gas/

RURAL TECHNOLOGY

Grantee G576: Ms Muliawati Siswanto, Physics Department, Faculty of Mathematics and Sciences, Universitas Indonesia, Jalan Salemba Raya 4, JAKARTA, Indonesia

"Studies on photovoltaic thin film p-n heterojunction for electric generation in rural areas"

IFS funding: 44800 SEK 1981 60000 SEK 1982
48000 SEK 1983

The majority of the population of Indonesia live in rural areas. As Indonesia is an archipelago, the provision of electricity is difficult in many areas. Ms Siswanto will try to develop a solar cell system suitable for rural areas in Indonesia. The research will be focused on the physical properties of the highest efficiency thin film solar cell to obtain a better understanding of the solar cell degradation processes.

/solar energy/ /electricity/

Grantee G577: Mr Rafael Sarmiento, Southern Mindanao Agricultural Research Center, University of Southern Mindanao, Kabacan, NORTH COTABATO 9311, Philippines

"Utilization of solar energy and agro-wastes for drying of natural rubber"

IFS funding: 42000 SEK 1981

Natural rubber has to a great extent been replaced by oil-based synthetic rubber. However, what with increasing oil prices, natural rubbber has become competitive again. About half the processing cost for natural rubber is attributed to the drying and smoking of the rubber. The smoke acts as a preservative since it inhibits mould growth. Mr Sarmiento will try to design low-cost driers and smokehouses. Locally-available fuels, such as rice hulls, coconut husks, rubber seed hulls, and charcoal derived from these materials will be used. A solar dryer for milled rubber will also be designed and tested.

/solar energy/ /drying/ /rubber/

RURAL TECHNOLOGY

Grantee G578: Mr Chirapol Sintunawa, Faculty of Environment and Resource Studies, Mahidol University, c/o R.S. Hotel, Larn Laung Road, Bangkok 1, Thailand

"Potential for biomass energy in Thailand"

IFS funding: 39480 SEK 1981

The Thai economy has traditionally relied upon the export of agricultural products to generate foreign exchange. However, the import of oil and oil products causes increasing strains on the balance of trade of the country. Mr. Chirapol Sintunawa will survey the availability of biofuels, and try to assess whether it is feasible to rely on such fuels to a greater extent. Data on cultivation areas will be collected to assess the potential for the establishment of biomass cultivations. The response of main crops to agricultural inputs will be established by manpower, cost and energy analyses. Technologies to convert biomass into energy will also be surveyed.

/renewable energy sources/ /biomass/

Grantee G620: Mr Mbwana Khatibu, Rural Industries Innovation Centre, Private Bag 11, KANYE, Botswana

"Research and development of biogas technology for water pumping in rural Botswana"

IFS funding: 69600 SEK 1982

It is estimated that more than 40 000 tons of cattle dung is produced per day in Botswana. The gas energy produced from this amount should be enough to supply more than 20 times the water need of Botswana by pumping from boreholes. Since the cattle herds are found around the waterholes, the collection of dung for biogas production is relatively easy. Botswana lacks forests and petroleum deposits and is therefore in urgent need for alternative energy sources. Mr Khatibu will find out the appropriate design for Botswana conditions of a biogas production unit run on cattle dung and convert the existing diesel engine to operate on dual-fuel for water pumping from boreholes. The size of the unit will be adequate for supplying over 600 cattle and 30 familiies with water.

/biogas/ /pumps/ /manures/

RURAL TECHNOLOGY

Grantee G657: Dr Janardan Rohatgi, Universidade Federal do Rio Grande do Norte, Campus Universitária, NATAL RN-5900, Brazil

"Optimizing Savonius rotor and water pump system for irrigation in the rural areas of Northeast Brazil"

IFS funding: 49125 SEK 1982 40000 SEK 1983

The northeast of Brazil occupies 400 000 square miles, most of which is a semi-arid region with irregular and unpredictable rainfall. This has resulted in a continuous migration of people from rural areas to cities. Dr Rohatgi will investigate the possibilities of running the Savonius rotor on wind energy. He will determine the optimum rotor geometry for maximum aerodynamic efficiency, including wind tunnel studies. The resulting prototype will then be tested for irrigation purposes.

/wind energy/ /pumps/ /irrigation/

Grantee G695: Mr Edi Kouassi Achi, Centre Technique Forestier Tropical, B P 33, ABIDJAN 08, Ivory Coast

"Evaluation of the technological characteristics of underutilized tree species in Ivory Coast"

IFS funding: 75000 SEK 1983

Ivory coast has almost 4 million hectares of forests representing about 120 million m3 wood, counting only trees with a diameter more than 60 cm. In these forests there are about 30 tree species which are not well known and which constitute a substantial economical potential. Mr Kouasse Achi intends to study the technological properties of some of the less known tree species in Ivory Coast. This involves measurement of technical parameters like bending characteristics, elasticity of the wood, axial compression, suitability for nailing, etc. The results of this project will indicate the possible use of the various tree products.

/forest trees/ /wood processing/

RURAL TECHNOLOGY

Grantee G696: Dr Ahmed-Faouzi Senhaji, Institut Agronomique et Vétérinaire Hassan II, B P 6202, RABAT-INSTITUTS, Morocco

"Development of techniques adapted to rural Moroccan conditions for pretreatment, solar drying and conditioning of fruits"

IFS funding: 78750 SEK 1983

About 85% of the Moroccan apricot production is located in the Marrakech region and its is restricted in time to one month during the year. Most of it is canned and exported, leaving very little for the poorer national market. Improved preservation techniques should allow access to inexpensive apricot products during a greater part of the year. Dr Senhaji intends to devise a pretreatment system and a solar drying technique for apricots with a view to obtain a good-quality product with good conservation characteristics at a reasonable cost.

/food preservation/ /fruits/ /drying/ /solar radiation/

Grantee G697: Dr Anil Mungikar, Department of Botany, Marathwada University, AURANGABAD 431004, India

"The development of optimal systems for green crop fractionation on small farms in Indian villages"

IFS funding: 52500 SEK 1983

More than 75% of the Indian population lives in villages intimately connected with agriculture and livestock. It is an urgent need to make the most efficient use of small farms and their resources, and crop fractionation may be one way of reaching this objective. Dr Mungikar intends to develop methods to fractionate locally-available green crops to produce feed for the livestock. The project includes the design of a screw press appropriate to the available crop materials and the development of a coagulation system to retrieve the utilizable products.

/feed production/ /appropriate technology/

RURAL TECHNOLOGY

Grantee G698: Mr Maharadi Dicko, Division de la Recherche Forestière et Hydrobiologique, Direction Nationale des Eaux et Forêts, B P 275, BAMAKO, Mali

"Comparison between different types of beehives for rural adaptation in Mali"

IFS funding: 66150 SEK 1983

Mali is one of the largest exporters of honey in West Africa and the national consumption is considerable. Presently the honey is harvested by burning the bee colonies, resulting in uncontrolled fires and the irreversible destruction of the colonies. Mr Dicko intends to develop beehives which are appropriate to the Malian rural conditions and which allow harvesting of honey without the use of fire and enabling permanent bee colonies. He will study three types of beehives in four ecologically representative regions of Mali by measuring the honey production during various periods.

/apiculture/ /animal housing/

Grantee G748: Dr Souleymane Kane, Ecole des Sciences, Université de Niamey, B P 10 662, NIAMEY, Niger

"Integration of fish and plant farming in a closed water circulation system using solar energy"

IFS funding: 60800 SEK 1983

Niger has suffered badly from the Sahel droughts and extensive losses of livestock. It is therefore necessary to encourage alternative ways of producing protein. Dr Kane will combine agricultural waste water treatment in a recirculation system for fish culture with production of algae and other water plants. Solar energy will be utilized for the circulation pumps.

/aquaculture/ /solar energy/ /waste waters/

RURAL TECHNOLOGY

Grantee G749: Dr Nequssie Retta, Department of Chemistry, Addis Ababa University, Box 1176, ADDIS ABABA, Ethiopia

"Endod as a set-retarding and air-entraining agent in the making of concrete"

IFS funding: 49600 SEK 1983

The berries from Phytolacca dodecandra, commonly called endod, can be dried and then suspended in water to produce a detergent solution. The bush is common in Ethiopia and its berries are traditionally used for washing purposes in rural areas.
Dr Nequssie Retta will investigate the potential use of endod as a set-retarding and air-entraining agent in the making of concrete. The study aims at making a low-cost and light-weight concrete which has a prolonged workability and therefore is suited to hot climates.

/cement/ /plant resources/

Grantee G750: Ms Gloria Mazariegos, Escuela de Ingeniería Química, Universidad de San Carlos de Guatemala, Ciudad Universitaria, Zona 12, P O Box 1545, GUATEMALA, Guatemala

"Design of equipment for the process of Corozo seed oil extraction"

IFS funding: 60900 SEK 1983

Corozo, Orbignya cohune, is an oilseed palm which grows wild in Guatemala. It is estimated that around 165 000 metric tons of corozo seeds are produced every year, only part of which is harvested. The seed contains an oil which may be utilized in various industrial processes. Due to difficulties in breaking the outer shell, the oil has not been produced in larger quantities. Ms Mazariegos will study various methods to separate the corozo seed from the outer shell and extract the oil. She also intends to characterize the fatty acids of the corozo seed. The ultimate goal is to design a process for large-scale production of corozo seed oil which may reduce costly coconut oil imports.

/oil palms/ /oilseeds/ /edible oils/

RURAL TECHNOLOGY

Grantee G751: Mr Venant Baratakanwa, Centre d'Etude Burundais des Energies Alternatives (CEBEA), Ministère des Travaux Publics, de l'Energie et des Mines du Burundi, B P 745, BUJUMBURA, Burundi

"Utilization of household wastes in the tropics by fermentation"

IFS funding: 80000 SEK 1983

Household wastes constitute an unutilized source of energy in small as well as large communities. Utilization of such wastes may also decrease pollution problems and improve hygienic conditions. Mr Baratakanwa will study a two-phase process for the anaerobic digestion of solid household wastes. He will investigate the microbial flora and the gas composition in order to optimize biogas producton. The biogas is intended for small-scale domestic consumption.

/biogas/ /domestic wastes/

Grantee G752: Dr Vincente Costanza, Instituto de Desarrollo Tecnológico para la Industria Química, (INTEC), Güemes 3450, 3000 SANTA FE, Argentina

"Development of technology for insulation of rural buildings with local trash trees"

IFS funding: 40000 SEK 1983

There are several locally-available tree specios which are discarded in the forestry industry. These include trees of low density such as Erythrina sp., Chorisia speciosa and C. insignis. Dr Costanza intends to study hygroscopical and thermal properties of trash trees in order to evaluate their potential as insulation in rural buildings. He will also investigate the chemical engineering and control problems for small-scale production of insulation boards.

/construction materials/ /trees/

RURAL TECHNOLOGY

Grantee G753: Mr I S A Nather Khan, Zoology Department, Universiti Malaya, Lembah Pantai, KUALA LUMPUR, Malaysia

"Biological surveillance and water quality monitoring of the Lingii River"

IFS funding: 54130 SEK 1983

The Lingii River is located in a rapidly developing part of Malaysia. As a result of industrialization and urbanization, the river has huge amounts of untreated industrial and urban effluents. Mr Nather Khan will investigate the correlation between simplified biological classifications and the suitability of water for the various requirements for fishery management, water consumption, and irrigation. The research will also include studies on the effect of water quality upon the production and species composition of the periphyton community.

INDEX BY SUBJECT DESCRIPTORS

This index is comprised of the subject descriptors used at the end of each grantee's research summary. Most of the terms are taken from the OECD MACROTHESAURUS. Asterisks *** indicate that they are not from this source.

INDEX BY SUBJECT DESCRIPTORS

AGRICULTURAL MACHINERY
G540

ANIMAL HOUSING
G494 G698

APICULTURE
G698

APPROPRIATE TECHNOLOGY
G697

AQUACULTURE
G748

BAGASSE ***
G495

BIOGAS
G620 G751

BIOMASS
G498 G578

BRICKS
G539

CEMENT
G749

CHARCOAL
G444

CONSTRUCTION MATERIALS
G259 G539 G752

DOMESTIC WASTES
G751

DRYING
G004 G132 G360 G401 G493 G577 G696

Previous Page Blank

INDEX BY SUBJECT DESCRIPTORS

EDIBLE OILS
G750

ELECTRICITY
G576

ENGINE FUELS
G496 G540

FEED PRODUCTION
G697

FISH PRESERVATION
G004 G401

FOOD PRESERVATION
G132 G493 G696

FOREST TREES
G695

FRUITS
G696

FUELS
G495 G497

FUELWOOD
G497

GREENHOUSES
G402

GROUNDWATER
G399

HYDROGEOLOGY
G399

IRRIGATION
G657

JUTE
G259

INDEX BY SUBJECT DESCRIPTORS

MANURES
G620

OIL PALMS
G750

OILSEEDS
G750

ONIONS
G132

PLANT RESOURCES
G749

POULTRY
G494

PRODUCER GAS ***
G495 G496 G497 G498 G540

PUMPS
G620 G657

RENEWABLE ENERGY SOURCES
G498 G578

RUBBER
G577

RURAL ENVIRONMENT
G496

SOLAR ENERGY
G004 G360 G401 G493 G576 G577 G748

SOLAR RADIATION
G696

INDEX BY SUBJECT DESCRIPTORS

STOVES
G444

TIMBER
G360

TREES
G752

WASTE WATERS
G748

WIND ENERGY
G657

WOOD PROCESSING
G695

INDEX BY COUNTRY

This index presents grantees by country.

INDEX BY COUNTRIES

ARGENTINA
G752

BANGLADESH
G259

BOLIVIA
G402

BOTSWANA
G620

BRAZIL
G657

BURUNDI
G751

ETHIOPIA
G749

GHANA
G360

GUATEMALA
G750

INDIA
G697

INDONESIA
G132 G576

IVORY COAST
G695

LAO PEOPLE'S DEMOCRATIC REPUBLIC
G497

MALAYSIA
G753

MALI
G698

MAURITIUS
G495

MOROCCO
G696

NIGER
G748

PHILIPPINES
G539 G577

REPUBLIC OF KOREA
G493

SENEGAL
G004

SEYCHELLES
G498

SRI LANKA
G444

THAILAND
G401 G496 G540 G578

UPPER VOLTA
G399

VIET NAM
G494

Previous Page Blank