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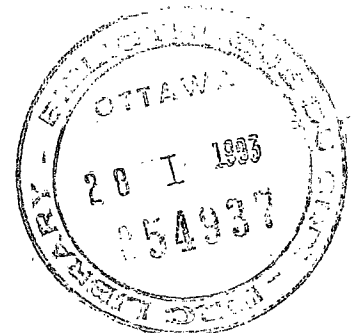
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# IDRC--ITS POLICY AND ENERGY ACTIVITIES

PRESENTED AT THE SYMPOSIUM ON INTERNATIONAL PROGRAMS

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\* The views expressed in this paper are those of the author and do not necessarily represent those of IDRC.

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## I POLICY

The International Development Research Centre (IDRC) was created in 1970 by the Parliament of Canada as an autonomous public corporation ". . . to initiate, encourage, and support research in the developing regions of the world, to apply and adapt scientific, technical and other knowledge to the economic and social advancement of those regions . . . "

IDRC is unique among international institutions. Funded by an annual grant from the Parliament of Canada, its policies are set by a twenty-one member Board of Governors representing Canada, other industrialized nations and the Third World. IDRC has sought to place in perspective the role of the scientist in international development and has encouraged developing countries to use the talent of their own scientific communities. It was the first organization set up specifically to support research projects totally conceived and managed by developing country researchers in terms of their countries' own priorities. It has helped to create research networks through which developing countries can share common experiences, conduct studies with a common design in areas of mutual concern and learn from each other as they work toward common goals. Also, it has fostered co-operation between developing country researchers and their counterparts both in Canada and in other industrialized countries.

In line with its mandate IDRC endeavours to accept and support research priorities as perceived by the developing countries themselves. It focuses support on researchers indigenous to developing regions and on practical applied research. In other words, the research must close

the gap in living standards between rural and urban areas. IDRC recognizes the importance of local research opportunities and training of Third World research scientists and technologists.

Although IDRC-supported projects are conceived, planned and executed by Third World scientists, the Centre does reserve the right of audit and of periodic reviews of the projects it supports. This function is carried out for the well-being of the project either by IDRC staff from headquarters in Ottawa or from one of the regional offices: at Singapore, Cairo, Nairobi, Dakar, and Bogota.

## II PROGRAMS

IDRC's activities are carried out by four program divisions, namely: Agriculture, Food and Nutrition Sciences (AFNS)

Health Sciences (HS)

Information Sciences (IS)

Social Sciences (SS).

The AFNS Division accounted for almost 40 per cent of the Centre's total project budget over the first ten years. Up to 1980, the AFNS program had appropriated some \$73 million in grants for 344 projects with the greatest concentration in the semi-arid tropics. Research supported by AFNS is grouped under five main headings: crops and cropping systems; fisheries and aquatic resources; animal sciences; forestry; and post-production systems.

During the first ten years the Health Sciences Division supported 168 projects with grants totaling \$25 million. In order to help clarify the interrelationships between health population and development and in order to deal with some of the specific technical problems involved,

this division's research support is divided under five main headings: rural health care delivery; tropical disease research; water supply and sanitation; fertility regulation methods; and occupational health.

The Information Sciences Division, over the last ten years, has supported 116 projects totaling \$22.2 million in grants. These projects dealt with some aspect of international co-operative information systems (AGRIS, DEVSIS), specialized information centres (cassava, grain legumes, irrigation, sorghums and millets, coconuts, rural youth activities, packaging materials and techniques, geotechnical engineering, ferrocement, environmental sanitation), information for non-scientists (Famille et Développement), industrial extension, (Technonet), cartography, or home activities (SALUS, MINISIS).

To date, the Social Sciences Division has been directly involved in approximately 350 projects disbursing some \$40 million in grants, which represents some 30 per cent of the Centre's project budget. In the broadest sense the research supported by the SS division is to help societies gain a better understanding of the processes of development and their effect on people and social institutions. This division presently supports four program areas: economics; education; population and development; and science and technology policy.

In addition to the aforementioned program divisions a Co-operative Programs (CP) unit was created within IDRC to provide a linkage between the Canadian scientist and his Third World counterpart. One million dollars was allocated for the 1981-82 fiscal year. The amount is expected to rise progressively in future years. The CP unit cuts across all four program divisions in that it provides support for co-operative research in any subject area proved to be important to

developing countries and in which Canadian expertise is recognized. Some examples of this type of co-operative project are: research on the extraction of gonadotropin for fish breeding at the University of British Columbia; the development of triticale at the University of Manitoba; and the development of a mechanical dehuller suitable for Third World crops, at the Prairie Regional Laboratory of the National Research Council at Saskatoon. Each of these have sister projects in the developing world. For example, the dehuller developed by PRL was field tested in Philippines, Lebanon, Botswana, Tanzania, Sudan, Sénégal, Ethiopia, Ghana and Nigeria.

Further information about IDRC in general, or on any of the four program divisions in particular, may be obtained by writing to IDRC, Box 8500, Ottawa, K1G 3H9.

### III INFORMATION DISSEMINATION

IDRC has a central library at Ottawa as well as smaller collections at each of the regional offices. At present the total holdings consist of some 35,000 books and a considerable number of journals. The library provides information and services to IDRC staff and projects, the Canadian international development community and, as resources permit, other development communities. In addition, the library acts as a test bed for technological, methodological, and bibliographical development and standards that may be appropriate for adaption by the international community and for implementation in IDRC projects. The library also provides advice and training on these developments and standards.

One of the services provided to IDRC staff and projects are current and retrospective literature searches. This is largely possible through

the in-house development of an information retrieval system (MINISIS), based on a set of computer programs (ISIS) developed by the ILO, which can run on the HP3000 mini-computer owned by the Centre (ISIS will only run on large mainframe computers). Anyone interested in learning more about MINISIS could write to the MINISIS support centre.

The Communications Division provides a valuable service as a publisher and information dissemination unit which gives the Canadian public an idea of the rôle of science and technology in development and the activities of IDRC through the publication of various brochures, pamphlets and magazines (in English, French and Spanish). The Communications Division also has in-house facilities for the dissemination of research results between scientists through the publication of monographs, giving research results; technical studies, reporting either the state-of-the art or advances in a specialized subject; or manuscript reports which report on preliminary research results but do not undergo the rigorous editing necessary for monographs or technical studies. Many of the IDRC publications have been written by Third World scientists, some by IDRC staff and a few by IDRC consultants. IDRC maintains an active mailing list of Third World institutions which are sent IDRC publications relating to their interests. A list of available IDRC publications is available from the Communications Division.

#### IV PRESENT AND FUTURE ACTIVITIES

Activities related to energy are primarily dealt with by the science and technology policy group with Social Sciences, and the forestry and post-production systems groups within AFNS.

Policy options facing the less developed countries include increasing the supply of primary energy, increasing the efficiency with which existing resources are utilized and more effectively managing the demand for energy. In terms of research, the first need is to identify the precise form of the various energy problems and various options open to solve them. Subsequent research aims at evaluating these options in terms of local needs and conditions, developing local production capabilities, or implementing programs of action.

In terms of energy-related projects, the largest number fall within the scope of the post-production systems (PPS) program. Projects in PPS look at either improving the quality or quantity of food, or reducing the amount of energy required (or changing its source) for a particular post-harvest process.

Post-production systems projects wherever possible use a multi-disciplinary approach to solve the problem. For example, in a grain storage project in Bangladesh the research team consists of an economist, agricultural engineer, pathologist, entomologist, physiologist, and agronomist--each contributing to the project in his area of expertise and interacting with other scientists on the team. On energy projects, mechanical engineers, agricultural engineers, economists and food scientists often work together. In fact, it was the apparent general lack of a multidisciplinary approach in many developing country drying projects that prompted IDRC to hold a workshop on food drying in July, 1981. The workshop brought together engineers, food scientists, and home economists to ensure that the engineer knew the rudiments about product quality and consumer acceptance while the food scientist and home economist gained an insight into heat and mass transfer, dryer design, etc.



IDRC has funded several surveys on energy utilisation and requirements. One such project is being carried out by the University of Alexandria as part of the PPS program. Three hundred households have been surveyed using an extensive questionnaire to determine what the energy requirements are and what options the households have to meet these requirements. At present results are being analyzed and it is hoped the report will be available by mid-1982. Another survey, funded through the Social Sciences Division is now completed and is described in the IDRC publication Rural Energy in Fiji: a survey of domestic rural energy use and potential. This publication discusses the present use of current energy in rural Fiji, evaluates alternative sources of energy supplies, assesses the advisability of expanding the use of biogas and looks at possible ways of improving domestic cooking practices notably through conservation. There has been follow-up action by the government of Fiji which is now also looking at urban energy use. Both of these surveys are a first for these countries.

The major thrust of energy projects with the PPS program (some thirty or more) are in drying of foodstuffs, either by use of solar energy, or by use of energy from agricultural wastes. Post production systems projects strive to introduce a technology which is technically feasible, socially acceptable, and economically viable. To me this implies use of simple dryers which can dry several local crops, and are built of local materials by the local people.

An example of an IDRC-funded solar rice (paddy) drying project is in progress at Fourah Bay College at Freetown. The project team carried out a survey of 1,000 farms throughout the country to determine farmer needs for a dryer. By knowing the required dryer capacity, time

of drying, total quantity to be dried and by having a good knowledge of what constitutes good quality paddy, the team was able to develop a promising prototype which will be field-tested throughout Sierra Leone during the next two years.

An example of a project using agricultural wastes is one at the Central American Research Institute for Industry (Instituto Centroamericano de Investigacion y Tecnologia Industrial--ICAITI) in Guatemala. In this project, coffee pulp is being used as a heat source for drying coffee. A project in India is using sorghum stalks to dry sorghum and several institutes in South East Asia are using rice husks as a fuel source for rice drying.

Post production systems projects in the future will probably examine the actual technology transfer to ensure that dryers developed do not end up as antiques in a laboratory. It is possible that future research will include topics other than drying, i.e. passive cooling, integrated energy village, hydro-electric power generated from small streams, etc.

The greatest quantity of energy used within the Third World countries is for the preparation of meals and for general home use. IDRC is funding projects within its Forestry program which look at conventional options in increasing efficiency of energy utilisation for this use. For example, each person in towns in the semi-arid areas verging on the Sahara needs one cubic metre of stacked firewood per year for cooking and heating purposes. It takes two hectares of natural forest to provide this and as cities grow, this can only mean a wider and wider search for fuel. On the other hand, research has shown that a single hectare of Eucalyptus in a plantation irrigated from a river

can supply the needs of fifty people. Drought resistant species such as Acacia and Prosopis supply the needs of twenty-five people in rainfed conditions where there is less than 500 mm of rainfall a year.

Although production of more wood is probably the most readily acceptable option to the consumer, in the long range others may be more practical. It has been estimated that as much as 90 per cent of heat provided by firewood is lost when used in cooking over an open fire or by use of an inefficient stove. In an IDRC-sponsored project in Tanzania a household survey was carried out in two towns to determine the extent of use of wood and charcoal and to assess different charcoal stoves used. After the survey some twenty stoves were brought in from rural Tanzania, other areas of Africa, and Asia to the project and they are now being compared and tested in an attempt to design an efficient stove that meets African conditions and is accepted by the women.

Another aspect of energy for meal preparation is that expended by the housewife herself. Survey results in Sénégal indicate that the housewife spends 10-17 hours daily obtaining wood and water, dehulling and milling grain and assisting in field work and looking after her family. Since the dehulling and milling of grain is a strenuous task both in Sénégal and other countries of the Third World, research on the development of a suitable mechanical milling system for crops such as sorghum, millet, maize and a variety of grain legumes, has received high priority in the PPS program.

Recognizing that charcoal is an alternative if wood cannot be obtained close by (since volatile gases are burned off in the charcoal

making process, these account for nearly 70 per cent of the heat value of wood), IDRC is looking into the future to supporting research on improved charcoal-making as well as on the use of tree species which have no value other than for firewood.

It is the belief of the Social Science division that energy policies, to be realistic, have to be built on a comprehension of total energy usage--renewable and non-renewable--for both the urban and rural sectors. To achieve such policies, developing country governments need information about the social and economic impact of different energy sources by which they can establish their own energy options.

The Centre has supported a number of studies in the past that contribute to an improved understanding of energy use. These have concentrated principally on the effects of energy technologies within the rural sector such as biogas in S.E. Asia, rural energy patterns in Fiji as described previously, and survey techniques. Following the Board's encouragement, a number of other studies were funded or are under development in 1981/82 on wider aspects of energy use and behaviour with relevance to developing country policy-making, and include studies on energy pricing (Bangladesh), urban energies (Fiji), intermediate technology for the countryside (Pakistan, Kenya, Indonesia), and energy use surveys for the household, government and business sectors (Argentina). The Division expects to spend \$400,000 this year on energy policy studies as part of the Science and Technology program.

The proposed areas for support in this expanded energy policy program are:

- a) Research which identifies and specifies the nature of Developing

Country problems--Developing countries must clarify the set causal relations that make up the pattern of energy use rather than define problems in terms of available technologies. Projects in this category would examine energy supply and demand at the macro and micro level, with special emphasis on energy of rural populations.

- b) Research to evaluate and identify energy technologies, particularly small-scale technologies with a predominantly rural application--Many countries require an independent assessment of current technologies for particular national and regional needs, and which emphasize options under actual operating conditions.
- c) Research for energy planning--Research in this area would examine non-technical policy options such as pricing, transport systems, and conservation. Other research issues include the way energy research is to be undertaken, gaps in research knowledge and the development of local capabilities for research planning, negotiation, implementation and training in the Third World. The Centre has already been approached as a direct result of the Nairobi conference, to participate in a research and review group that looks at energy research at a world level and its application and assessment in Third World conditions.