

EVALUATION OF THE
INTERNATIONAL FOUNDATION FOR SCIENCE
(IFS)
1974 - 1981

Final Report

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55.

Lima, April 1983

Evaluation of International Foundation for Science
(IFS)

Old evaluation report number was 2.4.1

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Lima, April 30, 1983

Dr. Camilla Odhnoff
Chairman of the Sponsors' Committee
International Foundation for Science
c/o Swedish Agency for Research
Cooperation with Developing Countries
S 105 25 Stockholm
Sweden

Dear Dr. Odhnoff:

Attached you will find the final report of the evaluation of the International Foundation for Science (IFS) commissioned by the Sponsors' Committee of the Foundation. It takes into account comments made at a meeting of the Sponsors' Committee held in Washington in early April 1983, where a preliminary version of the report was presented.

The report covers the period 1974-1981. Therefore, we have not been able to examine the effects of changes introduced during 1982 by the President and the Director of the Foundation, who were appointed at the General Assembly in November 1981. However, some figures pertaining to 1982 have been incorporated, particularly with regards to administrative matters.

We would like to leave on record our appreciation for the help and assistance received by all the persons connected with the IFS during the conduct of the evaluation. In particular we are grateful to the scientific advisors who took their time to write thoughtful responses to our queries, the Secretariat staff members who provided us with detailed information regarding IFS operations, Dr. Herlofson and his team who gave us detailed statistical information on IFS grants and grantees, the members of the Sponsors' Committee who shared their views and ideas with us, the authorities of National Member Organizations and of Host Institutions whom we interviewed, and also the grantees who provided us with valuable insights into the functioning of the IFS and its impact on their careers.

Finally, my colleagues in the Panel and myself are grateful for the confidence the Sponsors' Committee placed on us by commissioning the evaluation report. We trust it will be of assistance to you and the IFS community in general.

Yours sincerely,



Francisco R. Sagasti
Chairman of the
IFS Evaluation Panel

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I_N_T_R_O_D_U_C_T_I_O_N

The Sponsors' Committee of the International Foundation for Science (IFS) at its December 1981 meeting in Bonn agreed that an independent evaluation of the Foundation should be conducted. The Committee appointed a panel consisting of Dr. Francisco Sagasti from TEAD S.A., Lima, Perú, and Professor Geoffrey Oldham, Director of the Science Policy Research Unit at the University of Sussex, with the assistance of Doctors Pisit Vorauri, Vice-Rector of the Chiang Mai University in Thailand, and P. Thiongane, Director of the Institute of Agricultural Research in Senegal, to carry out the evaluation.

The IFS faced no immediate problems or difficulties, but after 8 years of operation the members of the Sponsors' Committee considered that an independent review of the Foundation's operation would provide useful information to help in charting the future course of evolution for the IFS. The Director and the members of the Secretariat shared, in the main, the views of the Sponsors' Committee, and agreed that the Secretariat would benefit from the opinions of an external panel regarding the performance of the IFS. In addition, it was made clear by the members of the Sponsors' Committee and of the Secretariat that the Panel's suggestions regarding the functioning of the IFS and the options it faces in the future would be welcome.

The Evaluation Panel undertook the tasks of reviewing the performance of the IFS and of making suggestions for the future. The Panel members devoted a combined total of 7 man-months to the evaluation during 1982, which precluded an in-depth assessment of each and every aspect of the operations of the IFS.

The present report is divided into three chapters. The first provides general information about the International Foundation for Science, covering a brief history of the IFS, the role it plays in relation to other funding agencies, and some basic features of the IFS' style of operation. The second chapter contains the main findings of the Evaluation Panel and is organized around several issues identified by the Panel during the conduct of the evaluation: the organizational structure of the IFS, the granting process, the grants, the grantees, the national member organizations and host institutions, the scientific areas, the funding patterns, the IFS Secretariat, and the impact of the Foundation. Finally, the third chapter contains a summary of the main conclusions and policy recommendations regarding options for the future.

The preparation of the present report in a short period of time would have been impossible without the enthusiastic and efficient collaboration of many persons related to the IFS. The Evaluation Panel would like to acknowledge the support and help provided by the Secretariat, in particular by Dr. Nikolai Herlofson, former Director, and Dr. Hans Sarap, present Director of the IFS. The time taken by the Project Secretaries, Mr. Jacques Galliard and Mr. Lennart Prague, by Bo Gohl, former project Secretary, and by the other members of the Secretariat, to answer the queries of Panel members is also gratefully acknowledged. The Scientific Associates of the IFS provided the Panel with a wealth of information and ideas on the granting process and the impact of the Foundation. During the field trips the staff members of the National Member Organizations, the personnel of the host institutions of the grantees, and the grantees themselves, provided the Panel members with information, opinions, and helped to obtain a view of the IFS from the field.

The team headed by the former Director of the IFS, Dr. Nikolai Herlofson, provided the Panel with a complete and very useful compilation and analysis of statistical data on IFS grantees. The time given to the members of the Evaluation Panel by Doctors Sven Brohult and Gordon Butler, former and present Presidents of the IFS, respectively, was most valuable, as were the interviews conducted with Nag Chaudhuri, Ruth Zagorin and Roger Revelle by one of the members of the Panel. The lengthy and detailed interviews conducted with the members of the Sponsors' Committee were also of considerable assistance.

The Evaluation Panel also made use of reports and articles on the IFS prepared by Louis Berlinguet, Rober Revelle, Stephen Awokoya, Gordon Butler and Jacques Galliard. The Institute for Scientific Information provided data on scientific authors.

Finally, the Panel would like to express its recognition to the members of the Sponsors' Committee for commissioning the review, which was a challenging task, and also for sharing their concerns regarding the operation of the IFS. The Panel hopes that the present report will help to consolidate the significant achievements of the International Foundation for Science, and to maintain and improve the excellent performance of the Foundation in the past.

C H A P T E R _ _ _ 1

GENERAL CHARACTERISTICS OF THE INTERNATIONAL FOUNDATION FOR SCIENCE

1.a. INTERNATIONAL SUPPORT FOR SCIENCE AND TECHNOLOGY IN DEVELOPING COUNTRIES

Evidence gathered during the last 20 years has shown a close interrelation between scientific and technological capabilities and the process of socio-economic development. The intimate connection between the acquisition of an endogenous science and technology capacity on the one hand, and productivity increases, better use of resources, improvements in the provision of social services on the other, has been extensively documented, to the extent that, at the close of the XXth Century, when scientific advances are permeating all productive and service activities, science and technology have become indispensable components of any development strategy.

The sixteen years elapsed between 1963, when the First United Nations Conference on Science and Technology for Development was held, and 1979 when the Vienna Conference on the same subject took place, witnessed a change in the perspective from which these issues are viewed. The relatively simple vision of a shelf of technologies, developed in the industrialized countries and available for purchase and transfer to the developing world, has been replaced by a more complex perspective, in which the acquisition of endogenous scientific and technological capabilities takes the central place and becomes a pre-condition even for taking advantage of existing technologies.

At present there is a growing awareness that developing countries must establish their own scientific research tradition and acquire a minimum level of technological capabilities. In order to achieve this, and because of the international nature of the scientific and technological enterprise, it is necessary to forge close links between the local and international science and technology communities. In this regard, international funding agencies and foundations play a very important role. For example, it is acknowledged that obtaining international support is of considerable help in obtaining local recognition for scientists, and also that international support provides a measure of quality control that helps to raise the standards of scientific and technological research carried out in developing countries.

Many international organizations are actively involved in the support of science and technology in the developing countries, even though this does not imply, by any means, that the level of international financial support is adequate. As an illustration, Table No. 1 shows some selected scientific and technological activities, ranging from individual research efforts to large scale research and implementation programmes, as well as their requirements, and characteristics. The Table also indicates the approximate level of funding in U.S. dollars per year involved in each activity and the funding agencies that provide resources for them.

It can be appreciated that while some private foundations provide support for individual research efforts, the International Foundation for Science is the only institution exclusively devoted to this purpose. There is a relatively large number of agencies providing support for research projects ranging between US\$10,000 and US\$150,000 per year, while for the large scale research and implementation

programmes that exceed US\$150,000 per year and could reach several million U.S. dollars, there is a comparatively smaller number of institutions and a relative predominance of international banks and lending agencies.

There appears to be an implicit division of labour among international organizations that provide funds for the three categories of scientific and technological activities indicated in Table No. 1. For example, the total amount of resources channelled by the IFS to grantees in 1981 was approximately US\$1.25 million, corresponding to 168 new grantees or renewals, while the agricultural sciences division of the Canadian International Development Research Centre (IDRC) initiated 51 projects totalling US\$12.1 million in 1981. In comparison, the total expenditures of the Consultative Group in International Agricultural Research (CGIR), exceeded US\$120 million in the same year.*

1.b. BRIEF HISTORICAL BACKGROUND ON THE IFS**

The idea of providing support to individual scientists in developing countries, helping them to fill the gap between the completion of a graduate degree and becoming fully established members of the international scientific community, was present from the beginning of the IFS. At the time the Foundation was established

* Throughout the report figures in US dollars will be used, even though the fluctuations in exchange rates, particularly with regards to the Swedish Krona, introduces some distortions. For this reason, some totals may not coincide.

** See Gordon C. Butler, "Science and Development: The Role of the International Foundation for Science", mimeo, n.d.; Wendy Barnaby and Roger Revelle, "International Foundation for Science", Bulletin of the Atomic Scientists, November 1981, pp. 26-32; and IFS Triennial Report 1981.

TABLE N° 1

TYPES OF SCIENTIFIC AND TECHNOLOGICAL (S&T) ACTIVITIES
AND SOURCES OF INTERNATIONAL SUPPORT

<u>TYPES OF S&T ACTIVITIES</u>	<u>REQUIREMENTS AND CHARACTERISTICS</u>	<u>RANGE OF FUNDING (US\$ per year)</u>	<u>FUNDING AGENCIES THAT PROVIDE SUPPORT</u>
Individual Research efforts	<ul style="list-style-type: none"> - Scientific capabilities and creativity - Interaction with peers - Access to literature and (possibly) travel - Access to scientific equipment and materials in a limited scale - One scientist with (possibly) technical assistants - Minimum of managerial skills - 1-4 years 	Less than \$10,000	<p>I F S</p> <p>Private Foundations (Ford, Rockefeller, etc)</p>
Research Projects	<ul style="list-style-type: none"> - Scientific and technical capabilities and creativity - Interaction with peers and with users of research results - Access to literature and travel - Access to specialized scientific equipment and materials in a continuous fashion - Multidisciplinary teams (e.g. 3-5 researchers plus assistants) - Access to (possibly) pilot plants and small scale field trials - Intermediate level of managerial skills - 2-5 years 	\$10,000-150,000	<ul style="list-style-type: none"> - SAREC - BOSTID (AID/NAS) - UNESCO - UN Agencies - UNDP - NUFFIC - IDRC - CIDA - AID - ORSTOM - SIDA - GTZ - Other bilateral agencies (Dutch, British, Belgian, Italian, etc.)
Large-scale Research and Implementation Programmes and Projects (possibly including extension work, industrial implementation and training)	<ul style="list-style-type: none"> - Technical and scientific capabilities - Interaction with other research groups, farmers, industry, government agencies, international agencies, etc. - Access to literature, travel and frequent field trips - Access to specialized laboratories and materials exclusively for the programme or project - Large multidisciplinary teams (e.g. 5-20 researchers plus assistants) - Access to pilot plants and industrial facilities, large scale field trials - High level of managerial skills and control - 4 or more years 	more than \$150,000, reaching in some cases several million US dollars	<ul style="list-style-type: none"> - WHO (tropical diseases) - CGIR - World Bank - IFAD - ADB - IDB

SOURCE: compiled by the authors

there was no international organization administering a program of small research grants devoted exclusively to this purpose. Indeed, the support provided to the IFS by other funding agencies in the field of science and technology for development (SAREC, IDRC, etc.) was based on the fact that, while they recognized the need for a programme of small individual grants, it was rather expensive and difficult for organizations geared to provide project funding to run efficiently a program of small grants for individual researchers.

The idea to establish the International Foundation for Science was first discussed at two Pugwash conferences in 1965 (Venice) and 1969 (Sochi). Roger Revelle, Abdus Salam, Robert Marshak and Pierre Auger were among the leading scientists involved in the early stages. Their ideas were discussed at a meeting of the United Nations Advisory Committee on Science and Technology, where Sven Brohult, then President of the Royal Swedish Academy of Engineering Sciences, heard about the idea and became its most active promotor. In 1970 a meeting was held in Stockholm with the participation of 50 scientists from nearly 20 countries to discuss the general characteristics of the Foundation, and by 1972 the Foundation had been established in Stockholm as a non-governmental organization.

One of the key decisions during the early stages of the IFS referred to the selection of fields of scientific research to be supported. While a broad range of fields, encompassing theoretical physics, molecular biology, civil engineering, agriculture, and many others were considered, an extensive survey carried out during 1971 and 1972 by Sven Brohult and Olle Edqvist led to a programme focused on food production

T A B L E N ° 2

BRIEF CHRONOLOGY OF THE INTERNATIONAL FOUNDATION FOR SCIENCE

- IN 1972 IFS was established by national academies or research councils from 12 countries. In 1981 it encompassed 60 research councils, academies of science and similar organizations in 55 countries. Two thirds of the present member organizations represent developing countries.
- IN 1973 Sweden and Canada, followed by France, provided initial financial support. In 1981 nine countries -and UNESCO- are financial sponsors. The annual budget is approximately \$2 000 000.
- The Interim Board of Trustees in 1973 decided to confine its activities to supporting research in six areas within agricultural and biological sciences. Subject to available funds, the Foundation would later enter into further fields of science and technology.
- IN 1974 The first 45 grants were awarded. Until the middle of 1981 support had been awarded to more than 500 grantees, and about 200 renewals of original grants has been awarded.
- IN 1975 The Foundation held its first General Assembly with 42 delegates from 23 countries. At the 2nd General Assembly in 1978, the Board of Trustees was advised to initiate expansion into a new area, "Rural Technology". The 3rd General Assembly was held in Chiang Mai in northern Thailand in November 1981 and introduced minor changes in the Statutes.

and forestry products. These fields are closely related to development problems and could lead to improvements in food production and in the quality of rural life. Furthermore, the provision of small individual grants for young researchers makes sense in these fields, while the same could not be said of other scientific areas where research requires support on a larger scale. Brohult and Edqvist recommended six subjects for consideration: aquaculture, animal production, vegetable production, mycorrhiza and afforestation, food fermentation and natural substances. These fields were endorsed by the Board of Trustees in 1973, and have remained the basis of the granting programme until the present day, with the addition of the field of rural technology in the late 1970s.

1.c. BASIC FEATURES OF THE IFS

The basic characteristics of the IFS, which differentiate this institution from other granting agencies, can be summarized as follows:

- The main objective of the International Foundation for Science is to promote the development of scientific and technological capabilities in the developing countries. This is done through the provision of financial support for research conducted by young scientists, helping them in their transition from completing their graduate work to becoming fully-fledged members of the international scientific community. It can be said that the IFS is involved both in supporting research and in providing on-the-job training opportunities for young scientists.

- The IFS funds developing country researchers working in developing countries, seeking to contribute to the creation of a research atmosphere with the young scientist at its centre. This involves greater risk than comparable operations in developed countries, but the fact that the IFS provides relatively small grants allows to take risks to a larger extent than other organizations that provide project financing.
- Grants are given in a selected number of areas, concentrating the resources, maintaining continuity, and helping to build networks of developing countries' scientists.
- Small grants (maximum US\$10,000 per year) are provided to young scientists, whose institution is supposed to pay his basic salary. In practice, the International Foundation for Science supports cooperative projects with the host institutions, whose contribution (the researcher's salary) may be of an equal order of magnitude to that of the IFS. Therefore, it can be said that the IFS works in concert with a very large number of research institutions in more than 60 developing countries.
- The IFS maintains a personal relationship and provides services to its grantees upon request, in the form of bibliographic assistance, purchase of equipment and materials, travel arrangements, assistance for workshops, and also provides some technical guidance to its grantees through its pool of Scientific Advisors and through the Project Secretaries.

- The grants provided by the IFS cover only the "research" end of the research and development spectrum. No resources are provided for the transition from laboratory results to pilot plants and production. In this sense, the International Foundation for Science has found its niche in the implicit division of labour among international science and technology funding organizations, leaving the implementation of research results to other agencies.
- The International Foundation for Science aims at setting international standards for supporting the work of young scientists in developing countries. To this end the Scientific Advisors and the Project Secretaries screen grant applications, keeping the criteria of scientific and technological merit in mind. The Foundation also organizes regional symposia where the IFS grantees can present the results of their work to an international group of scientific peers.
- The International Foundation for Science is basically an international, multilateral, non-governmental organization, and it derives its freedom and flexibility of action from this fact. It would not be possible to operate with the same flexibility and efficiency were governments directly involved in it, or were it burdened by the administration of bilateral programmes.

These basic features confer the IFS its unique character, and constitute the basis of what many scientists in developed and developing countries perceive as the success of the IFS.

C H A P T E R 2

THE FUNCTIONING AND PERFORMANCE OF THE INTERNATIONAL FOUNDATION FOR SCIENCE

There are no standard and well defined procedures available for evaluating an organization like the IFS. The special features of the Foundation, the wide geographical spread of its activities, and the inherent difficulties in defining the "output" of the institution, make it impossible to use standard evaluation procedures for organizations. For this reason, the Evaluation Panel adopted a pragmatic approach, combining interviews with grantees, Scientific Advisors, Secretariat staff members, and other persons associated with the Foundation, with an analysis of statistical data on the grants and grantees, and with a study of documents and reports concerning the IFS. However, time and budget limitations precluded the Panel from carrying out a thorough study of each and every aspect of the IFS operations. Furthermore, even though there was close interaction with the IFS personnel, the Evaluation Panel has maintained an independent perspective in accordance with the external character of the evaluation requested by the Sponsors' Committee.

The sources of information used in the present evaluation of the IFS are multiple and varied. A detailed statistical analysis of grantees was requested by the Evaluation Panel, and a special team headed by the former Director of the IFS, Dr. Nikolai Herlofson, worked at this task, which provided most of the information regarding grants and grantees. A questionnaire

was also sent by the IFS Secretariat to all grantees, covering the grantees' research career and publishing activities. The Evaluation Panel sent questionnaires to all the National Member Organizations, asking for their views and opinions on the IFS, and also sent questionnaires and requested the views of the Scientific Advisors. In addition, interviews with grantees, authorities from the host institutions, and staff members from the National Member Organizations were conducted in South and South East Asia, West Africa and Latin America by the members of the Panel. These were complemented with interviews with members of the Secretariat, of the Sponsors' Committee, with some trustees, and with other persons concerned with the Foundation. Finally, the Evaluation Panel also benefited from access to other evaluation reports, in particular those conducted by Dr. Louis Berlinguet regarding the practical applications of IFS projects, and Dr. Stephan Awokoya, regarding an overall assessment of the IFS.

The present chapter covers several aspects of the operations of the IFS, including: the organization structure, the granting process, the grants, the grantees, the National Member Organizations and host institutions, the scientific areas, the funding patterns, the IFS Secretariat, and the impact of the IFS grants. As will become apparent, the different length of the sections reflect the selective attention given by the Evaluation Panel to the various aspects of the operation of the IFS, in accordance with the interests of the Sponsors' Committee.

2.a. THE ORGANIZATIONAL STRUCTURE OF THE IFS

The basic organizational structure and the functions of the various IFS bodies are defined in the statutes of the IFS. The main bodies involved in the IFS are the General Assembly, the Board of Trustees and its Executive Committee, the Sponsors' Committee, the Programme Committee, the Director, Project Secretaries and other members of the Secretariat staff, and the Scientific Advisors. In addition, there are other entities such as the National Member Organizations, the host institutions and the sponsoring agencies, which in addition to the grantees, conform the cluster of agencies and individuals related to the IFS.

Figure N°1 contains a description of the structure of the International Foundation for Science as indicated in the IFS statutes. In addition, the Evaluation Panel has interpreted the present organizational structure of the IFS as shown in Figure N°2 indicating the lines of authority and interrelations among the various IFS organs.

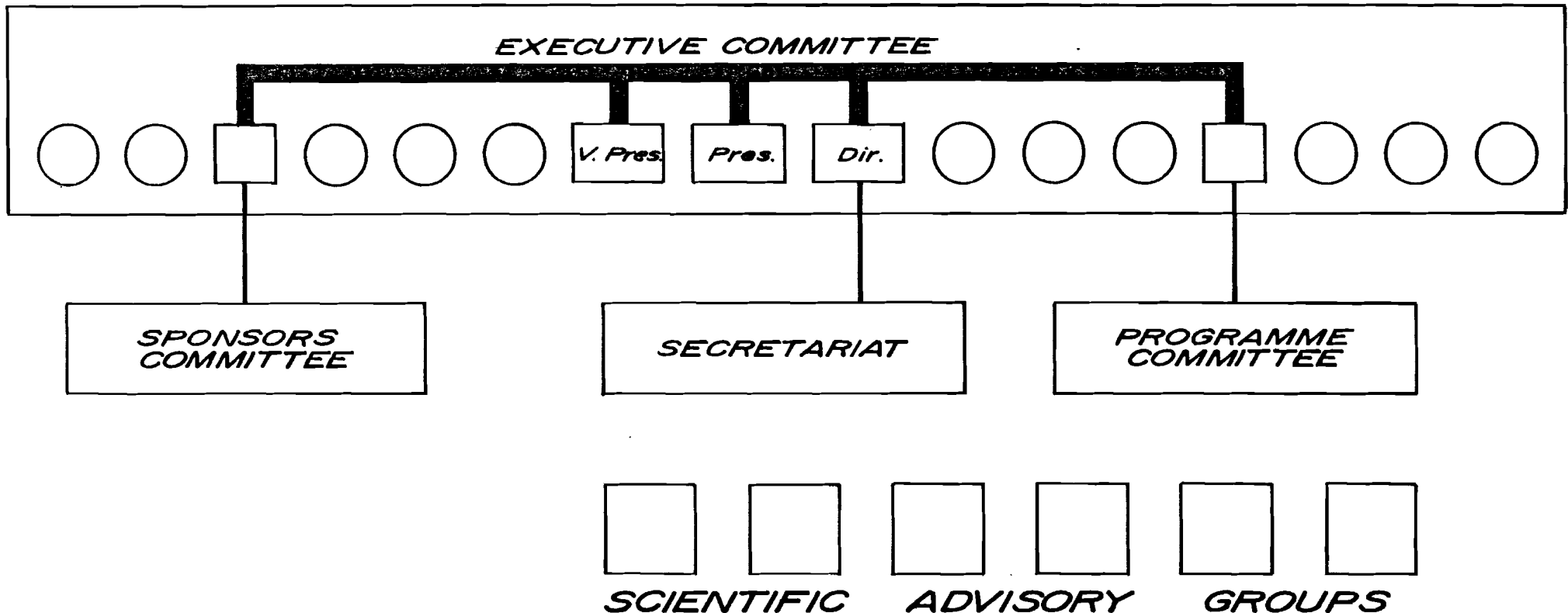
The General Assembly is the maximum body of the IFS and consists of representatives from the members of the Foundation. It has the general functions of admitting new members to the Foundation, electing trustees, approving annual reports, making recommendations to the Board of Trustees, amend statutes and, in general, giving overall guidance to the IFS. It meets every three years.

The Board of Trustees is the governing body of the IFS which determines policies and fulfills the corporate responsibilities of the Foundation. It has 16 members,

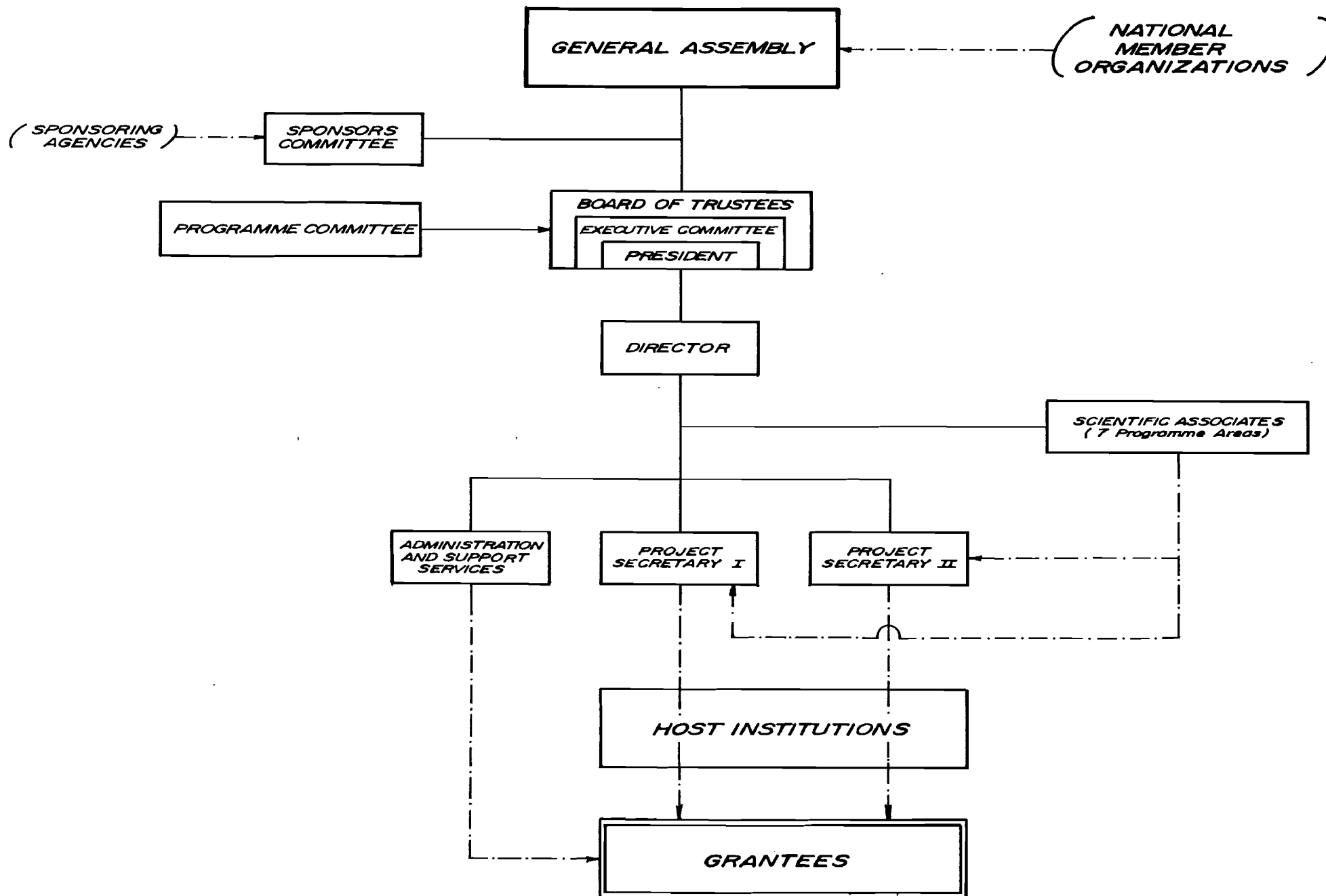
STRUCTURE OF THE INTERNATIONAL FOUNDATION FOR SCIENCE (AS INDICATED IN THE IFS STATUTES)

BOARD OF TRUSTEES

EXECUTIVE COMMITTEE



PRESENT ORGANIZATION CHART OF THE INTERNATIONAL FOUNDATION FOR SCIENCE
(AS INTERPRETED BY THE EVALUATION PANEL)



including the President, who are appointed by the General Assembly, even though up to five trustees are appointed upon by the Sponsors' Committee and one upon nomination by the International Council for Scientists. The Board of Trustees is responsible for the conduct of the affairs of the Foundation, and its functions include supervising the administration, determining financial plans and programs, supervising the granting activities of the Foundation, and appointing the Director and the other members of the Secretariat staff. It meets once a year and has final budgetary and granting authority.

The Board of Trustees has an Executive Committee of five members --the President, the Vice-President, the Chairman of the Sponsors' Committee, the Chairman of the Programme Committee, and the Director-- which is entrusted to exercise and perform all the functions of the Board in between meetings of the Board, excepting altering any fundamental policy of the Board, and increasing the total budget authorized by the Board. It should provide detailed information to the Board on the decisions it has taken in between Board meetings.

The Sponsors' Committee advises the Board on financial matters, helps in fund-raising activities and serves as a forum for the exchange of views among donors to the IFS. It is composed of a Chairman appointed by the Board of Trustees and of one person appointed by each donor agency that exceeds a minimum contribution, at present SK 300,000, during the preceding financial year. The Sponsors' Committee can also appoint up to five members to the Board of Trustees. More recently, the function of advising the

Board of Trustees on general policies has been added to those of the Sponsors' Committee.

The recently established Programme Committee has the function of advising the Board on scientific and technological matters related to the objectives of the Foundation and on the granting policies of the Foundation. The Programme Committee is composed of a Chairman and of not less than 6 persons of distinction in the natural or social sciences or in technology, and is appointed by the Board of Trustees.

The President of the Foundation is nominated by the Board, and is the Chairman of the Board of Trustees and of the Executive Committee. The Director is the principal executive officer of the Foundation and acts on behalf of the Board. He is responsible for the conduct of granting activities, for handling financial and administrative affairs and is also the legal representative of the Foundation. He also acts as Treasurer and has the authority to commit the Foundation for the receipt and disbursement of funds, the execution of contracts, and for employing the Secretariat staff. The Director is assisted by several staff members, and relies on the Project Secretaries for the identification of potential grantees, the processing of applications, the servicing of various committees involved in the granting process, and for keeping in touch with the grantees. In a real sense, the Project Secretaries constitute the technical core of the Secretariat of the Foundation.

The Scientific Advisors, organized in seven advisory groups programme areas, are one of the key components of the Foundation's operations. They have the

responsibility of assessing the scientific merit of eligible applicants and of advising the Board on the approval or rejection of grants. They serve voluntarily and on a personal capacity, and not as representatives of any agencies, institutions or other organizations. Their comments and recommendations concerning applications are processed by the Secretariat, and the Director has the responsibility of channelling the recommendations to the Executive Committee and the Board of Trustees.

The Evaluation Panel has found that, from a scientific and technical perspective, one of the basic factors in the success of the operation of the IFS has been the significant role played by the Scientific Advisors and their close working relationship with the Project Secretaries. The Scientific Advisors in a particular advisory group receive the applications sent to them by the Project Secretaries for comments and usually reply by mail. In addition, a small group of up to five Scientific Advisors from each field meet twice a year to review the applications processed by the Secretariat and to consider the opinions of other Scientific Advisors sent by mail. The willingness and interest of the Scientific Advisors to commit their time to reviewing applications on a voluntary basis and without compensation has been one of the unique features of the IFS.

Outside the organizational structure of the Foundation, there are the National Member Organizations, which are national academies, research councils, or other representative bodies in the field of natural and social sciences and technology. In addition to attending the General Assembly every three years and electing the Board of Trustees, the National Member Organiz-

ations have the general function of disseminating information about the IFS in their respective countries and of building up a constituency that would support the operations of the Foundation. At present there are more than 50 National Member Organizations in more than 40 countries.

The Host Institution to which the grantee belongs is another body that plays a significant role in the IFS operations. In the first place, it has to endorse or approve a grantee's application before it is considered formally by the IFS, and it also covers the salary of the grantee during the period of the award. This makes the IFS grants truly collaborative endeavours between the International Foundation for Science and the host institutions to which the grantees belong. In addition, the host institution usually plays a supporting role to the grantee, providing administrative services for the management of the grant.

Finally, there are the grantees themselves, who are the beneficiaries of the Foundation and to whom all the organization is directed to serve. They relate to the IFS through the Project Secretaries during the granting process, and often receive services provided by the Foundation to assist them in the conduct of the research.

In general, the present organizational structure of the IFS appears to be consistent with the objectives and functions of the Foundation, even though there also appears to be room for a certain simplification, particularly with regard to the number of committees and meetings. However, this will become more clear after an examination of the granting process in the following section.

2.b. THE GRANTING PROCESS

The granting process is the collection of activities, decisions, and procedures that begin with the potential pool of applicants for the IFS grants and takes them through the successive stages to the point when the grant is completed. The basic structure of the granting process has remained the same during the eight years of operations of the IFS, even though it has evolved slowly to the point where it processed nearly 200 applications in 1981. Figure N°3 shows a flow chart of the present granting process as interpreted by the Evaluation Panel on the basis of conversations with Secretariat staff members, Scientific Advisors, grantees and other organizations related to the IFS.

Reception and Processing of Applications

The potential pool of applicants comprises all those young scientists, preferably recent graduates, who have obtained their Masters or PhDs at home or abroad, and who are interested in pursuing a scientific career in any of the seven scientific areas supported by the IFS. They obtain information about the IFS from a variety of sources, including the Secretariat, the National Member Organizations and, to a large extent, former and present IFS grantees. The approximate total of enquiries reaches 300 per year. There follows an exchange of information between the Secretariat and the potential applicant, which results in approximately one hundred of them being considered unsuitable as candidates for an IFS grant. Nearly 200 applications are submitted after this preliminary filter for evaluation by the IFS Secretariat.

FLOW CHART OF THE PRESENT IFS GRANTING PROCESS

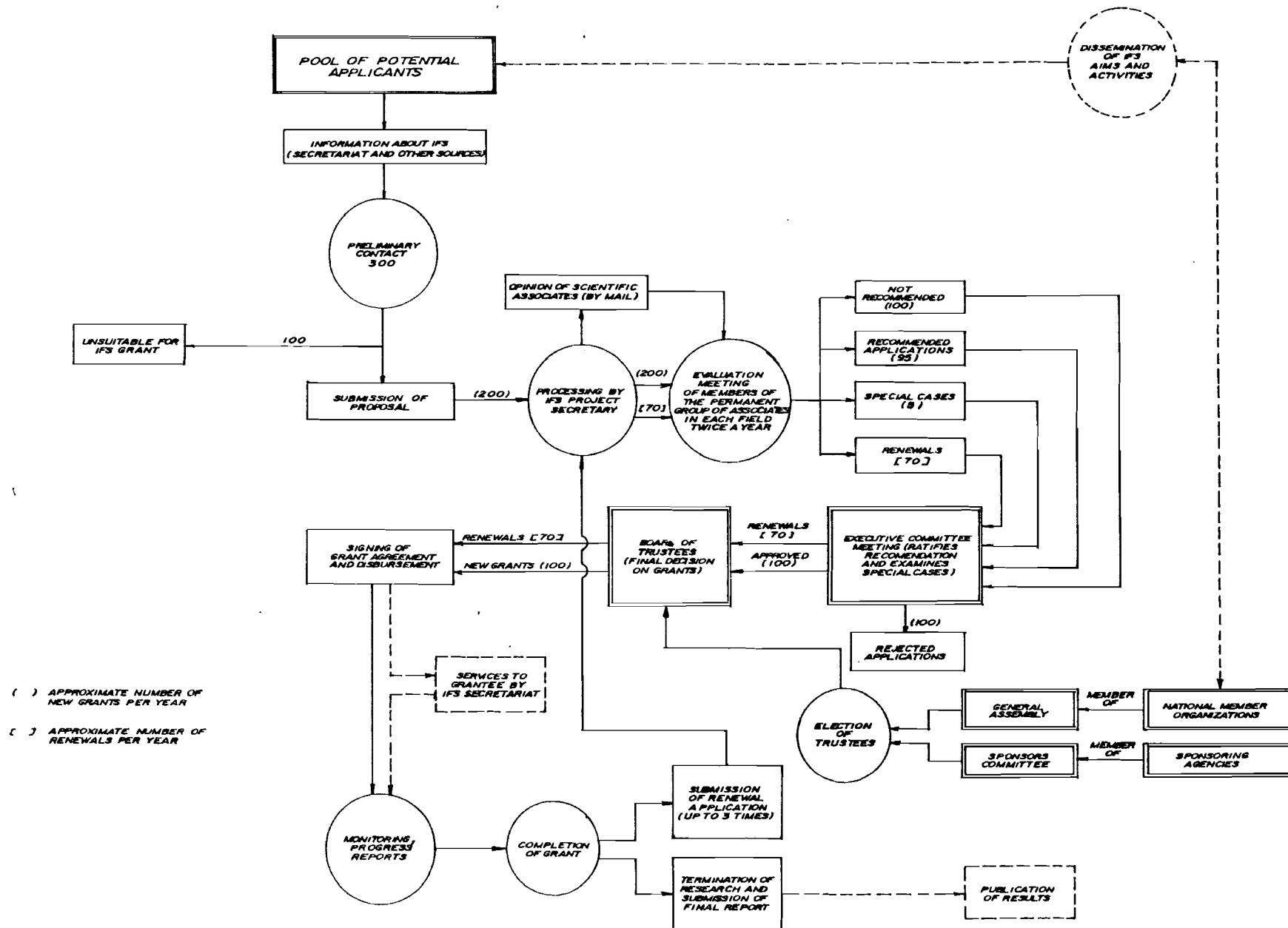


FIGURE No. 3

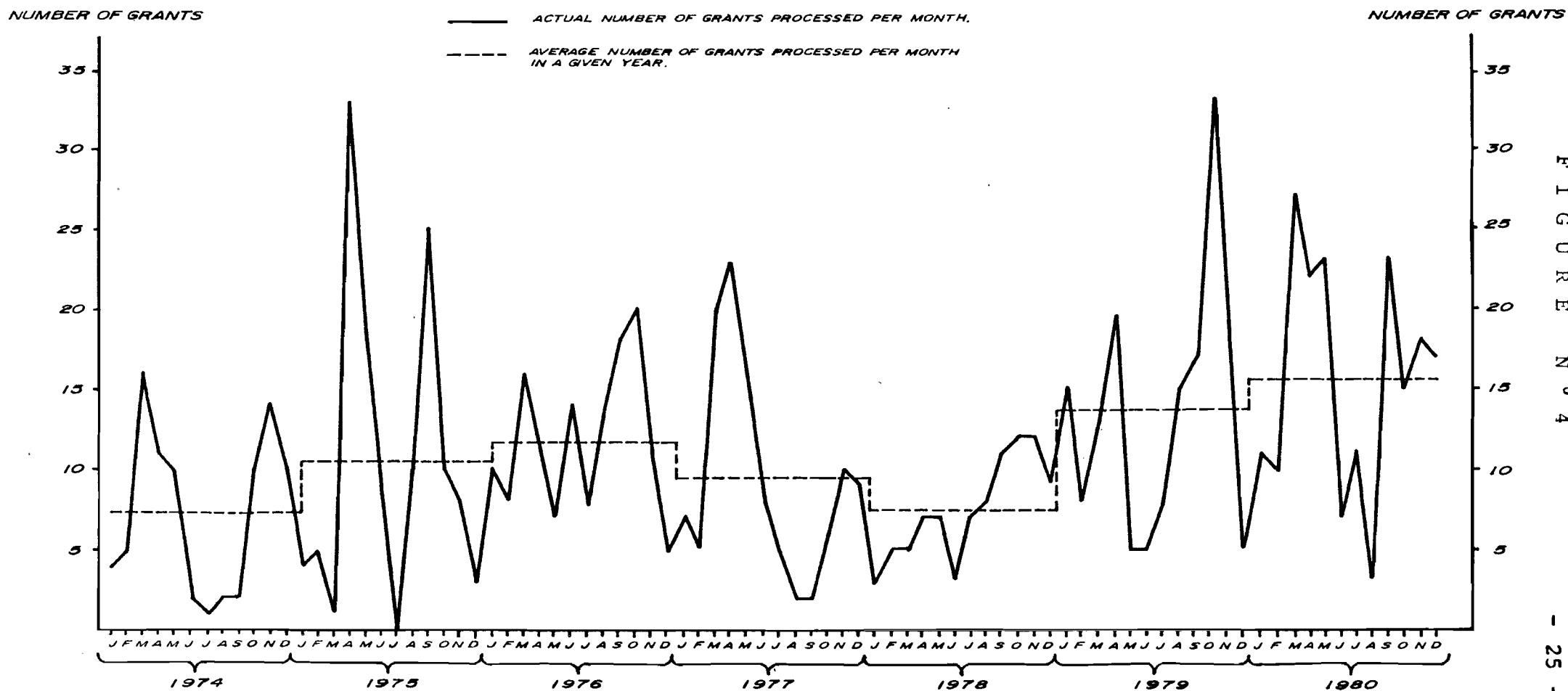
In order to be accepted for processing proposals must come from a developing country researcher in a developing country, the scope of the project must follow in one of the seven programme areas of the IFS, and all the project information must be contained in the project application forms. While the processing of 200 proposals per year would be equivalent to slightly more than 16 proposals per month, in fact there is great seasonal variation in the number of applications processed monthly by the Project Secretaries (Figure N°4).

These figures would imply that Project Secretaries should process, on average, one application every two days, but the frequent and long trips and the fact that many proposals are received after the Project Secretaries' field trips, lead to great differences in the number of applications processed monthly. In addition, the Project Secretaries have to schedule the meetings of the permanent members of the advisory groups before the Executive Committee meetings. All of this means that the Project Secretaries and the Director of the IFS have a very uneven working load with regards to the processing of applications.

Evaluation of Applications

Once an application is accepted for processing by the Secretariat, the Project Secretary sends the proposals to the permanent members of the scientific advisory groups, and also selects two other members from the scientific advisory groups to be consulted by mail. The replies received from the Scientific Advisors and all the pertinent material on each application is put together in a dossier by the Project Secretary and taken to the meeting of the permanent members of the Scientific Advisory Group. Each of the proposals under consider-

NUMBER OF GRANT APPLICATIONS PROCESSED BY THE IFS PROJECT SECRETARIES ON A MONTHLY BASIS (1974 - 1980)



SOURCE: IFS Secretariat

ation is reviewed carefully, with the Scientific Advisors commenting on the quality of the proposal, its relevance, the chances that it will be completed successfully, and its relation to the state of the art in the field. The comments sent by mail by the other advisors are also read at the meetings, and the Project Secretaries put forward their opinions and their knowledge of the local conditions, the host institution, and the grantee if they know him personally. It is interesting to notice that in most cases (around 85 to 90%) the judgement of the permanent group of Advisors in a scientific field coincides with that of the Project Secretary.

In the process of evaluation, the critical piece of information is the "description of research" contained in the application forms. After the evaluation meetings of the Scientific Advisors and the Project Secretaries in each of the scientific areas, applications could be either rejected, recommended (new and renewals), or they may fall in a "special case" category to be examined and decided by the Executive Committee.

There are certain interesting features of the evaluation process and of the criteria for evaluating grants. To a large extent, the Scientific Advisors tend to emphasize the scientific and technical feasibility and soundness of the proposals, paying relatively less attention to the personal characteristics of the applicants and the conditions prevailing in the host institution and in the country of the researcher. On the other hand, the Project Secretaries, who frequently know personally the applicants and their institutions and have a general background knowledge of the prevailing local conditions, tend to put more emphasis

on the applicant's potential for development. The criteria related to the project proposed by the applicant, and those referring to his potential for scientific and technical development are combined before making a recommendation to the Director and to the Executive Committee. Furthermore, in many cases the Scientific Advisors themselves are familiar with an applicant's background, institution and with local research conditions.

Processing of Grant Renewal Applications

The Project Secretaries process the applications for renewal of grants taking into account information regarding the progress during the preceding period. Renewals are given first priority over new grants and, in general, the procedures for evaluating renewal applications are simpler and more straightforward than those for new grant applications.

Approval of Grants

All the pertinent information regarding the applications and the recommendations of the Scientific Advisors is put together by the Director, with the assistance of the Project Secretaries and presented at an Executive Committee meeting. This Committee takes a decision on the approval or rejection of new grants and renewals, and forwards them to the Board of Trustees for ratification.

In this way, there are four instances for the approval of grants. In the first place, applications are discussed at the meetings of the Scientific Advisors;

taking into account the input from the Project Secretaries; second, recommendations are made by the Scientific Advisors to the Executive Committee; third, decisions taken by the Executive Committee and forwarded to the Board; and, finally, there is the ratification by the Board of Trustees. In a given year, this process requires a total of 14 meetings of scientific advisory groups, 2 meetings of the Executive Committee, and 1 meeting of the Board of Trustees, although one of the Executive Committee meetings takes place concurrently with the Board of Trustees.

Grant Agreement and Disbursement

After the Executive Committee and the Board of Trustees make the final decision on grants, the grantees are informed, grant agreements are signed, and funds disbursed to the grantees. In some cases, the IFS Secretariat provides services to the grantees, consisting primarily in the purchase of scientific equipment and of expendable supplies, the provision of literature, and making travel arrangements.

Monitoring and Follow-up

After a grant is awarded there is usually very little contact between the grantee and the IFS Secretariat, except in the cases where services are provided by the Secretariat. The monitoring of grantees and the follow-up of their research activities take place in a more or less ad-hoc fashion, through travels by the Project Secretaries, visits by some Scientific Advisors, and also through the organization of regional workshops in a specific programme area. However, there are cases

where progress reports by grantees are not followed by the Project Secretaries, primarily because of the excessive workload and the time-consuming nature of monitoring activities. A more systematic review of the progress of the grantees takes place when the grantee applies for a renewal; there are special forms in which advances in research and the results obtained should be described.

Once a particular grant is completed, the researcher can either apply for renewals up to three times, and his application is processed by the IFS Secretariat following the procedures indicated above. When the research is terminated, it is expected that the results would lead to publication.

Some General Remarks on the Granting Process

There are several interesting issues that emerge from the analysis of the granting process. First, Project Secretaries have a very heavy workload with regard to the processing of applications and there appear to be several instances where the same information is reviewed and similar decisions are arrived at (meetings of the Scientific Advisors, the Executive Committee and the Board of Trustees). This should be avoided. Second, there is the problem of standards applied by the Scientific Advisors and Project Secretaries in evaluating proposals, and whether there should be different standards according to regions or countries. When the criteria referring to the applicant, its host institution and the local conditions for scientific research are balanced against the scientific merits of the proposal, it is

impossible to avoid a certain differentiation that would take into account the personal characteristics of the applicant, the type of institution, and the local scientific environment. Aggregated over time and accross scientific areas, this may lead to the application of different standards for different regions and countries. In principle, this would allow to correct biases that are likely to emerge in the award of grants because of the different levels of scientific and technological development, and may constitute a desirable feature for the granting process.

In the third place, the Scientific Advisors, whether they give their opinions by mail or are part of the permanent group in each scientific area, have emerged as one of the keys to the success of the IFS. The fact that they review applications voluntarily and without compensation (excepting travel expenses) shows their committment to the IFS. Another indication of the interest of the Scientific Advisors is the relatively large number of responses to the questionnaires sent by the Evaluation Panel.

In effect, Table N° 3 shows the total number of Advisors* in each scientific area, indicating whether they are from developed countries. A total of 33 Scientific Advisors out of 60 responded to the questionnaire, and most of them gave very thoughtful and lengthy answers to the queries of the Evaluation Panel. Indeed, the opinions of some of the Advisors are interesting enough to warrant quoting in the evaluation report, and Table N° 4 contains some of the most interesting quotations found in the Scientific Advisors' letters.

* In this report the titles of "Scientific Associate" and "Scientific Advisor" are used interchangeably.

T A B L E N ° 3

RESPONSES FROM SCIENTIFIC ASSOCIATES
TO THE EVALUATION PANEL QUESTIONNAIRE

<u>Scientific Area</u>	<u>N° of Associates</u>	<u>N° from Developed Countries</u>	<u>N° from Scandinavia</u>	<u>N° who Replied</u>
Acquaculture	15	11	2	10
Animal Production	7	4	3	5
Vegetables	20	12	2	10
Mycorrhiza	6	5	2	5
Fermentation	4	3	3	1
Natural Products	6	5	3	1
Rural Technology	2	2	2	1
	—	—	—	—
T O T A L	60	42	17	33
	==	==	==	==

SOURCE: Compiled by the Evaluation Panel

T A B L E N ° 4

SELECTED QUOTES FROM ADVISORS' LETTERS

"General impression is that the IFS is an efficient organization which in spite of limited means is of great importance for the progress of science in many parts of the world"

"IFS is by far the most efficient funding agency with which I have dealt since I began work in tropical agriculture"

"The IFS Secretariat is sympathetic, helpful, understanding and efficient: unfortunately the same cannot be said for most other international agencies and institutions"

"I would conclude by emphasizing my appreciation of the contribution which IFS has made, and continues to make, towards the formation of young scientists in developing countries. In terms of the cost benefit of the exercise, it is my belief that the IFS has been very much more effective than any other International Agency, in this respect."

"I believe the great strength of the IFS lies in its personal and flexible approach to the problems of scientists in developing countries"

"I think IFS Programme has been successful because it has nominated broad areas of interest and has then asked individual scientists in developing countries what they want to do"

"I am a scientific advisor some about 3 or 4 years and I do not hesitate to say that this is one of the many honorary jobs I have to do which I am doing with the greatest of pleasure. I am of the opinion that the IFS is of very great help to young scientists of developing countries with only a minimum of bureaucratic expense"

A fourth issue deserving special attention is that until 1980 the applications recommended for approval roughly matched the available resources of the Foundation in a given year. This is to say, that the total amount of money involved in the grants worthy of support was of the same order of magnitude as the resources available to the Foundation. However, for the first time in the history of the IFS, in 1981 the resources required for grants recommended for approval exceeded the availability of funds, and this forced the rejection or postponement of certain applications, even though they should have been supported according to the IFS criteria. This is a problem that must be examined carefully, and may require that the IFS resources be increased or that standards for grant approval be raised in certain scientific areas or regions.

2.c. ANALYSIS OF THE GRANTS PROVIDED BY THE IFS

Until the end of December 1981 IFS had awarded a total of 886 grants in 69 countries, distributed as follows:*

	<u>Amount</u>	<u>Average size</u>
549 new grants	\$ 3.544.700	\$ 6.420
245 first renewals	1.519.200	6.160
77 second renewals	513.400	6.600
<u>15 third renewals</u>	<u>95.900</u>	<u>6.470</u>
TOTAL 886 grants	\$ 5.673.200	\$ 6.400

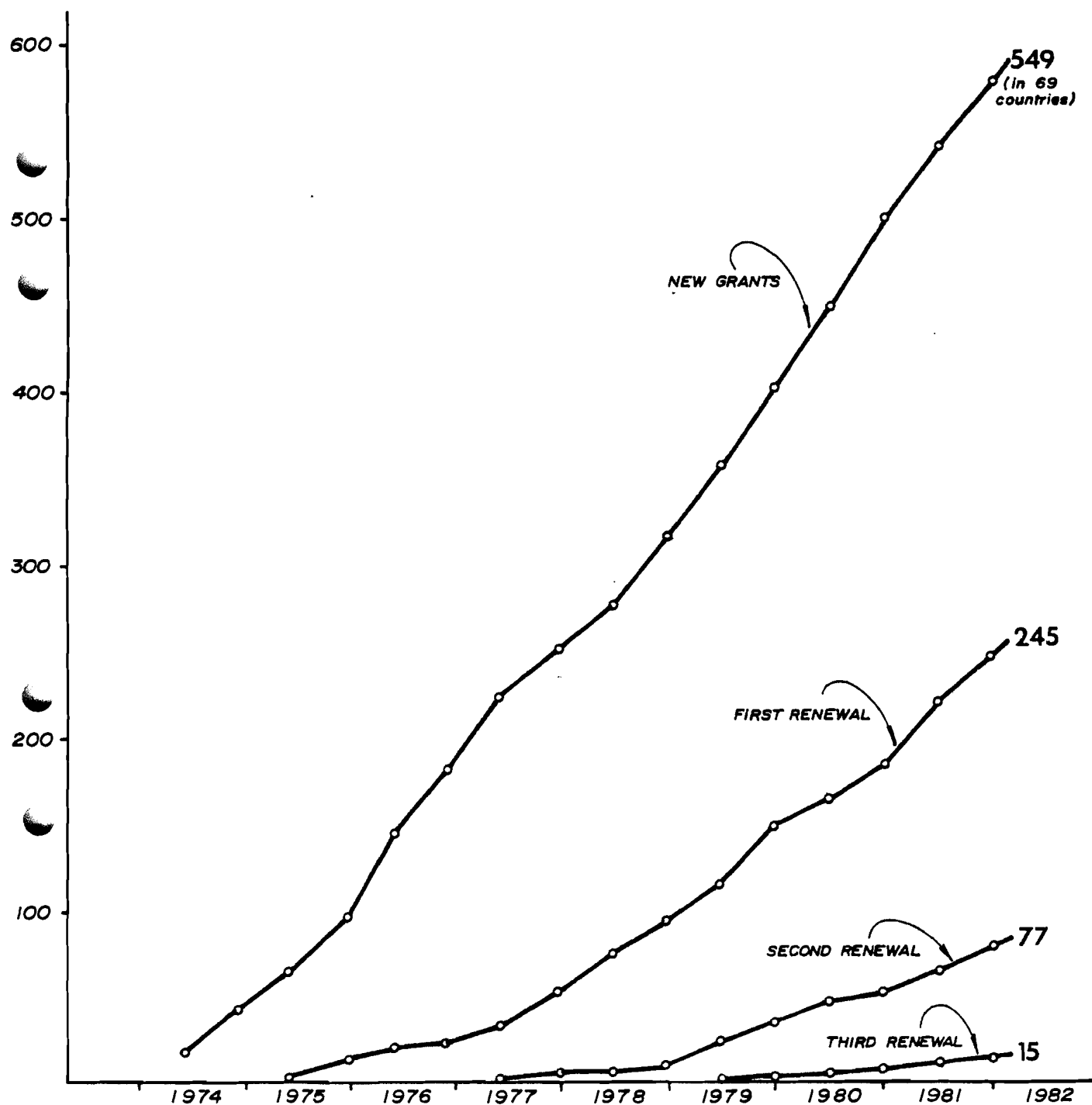
While the total amount of resources may not appear impressive when compared to the amounts disbursed by other funding agencies in the field of science and technology, the fact that nearly 600 grantees had been reached in approximately 70 developing countries shows that the IFS has made a significant effort to reach and support young scientists in developing countries all over the world.

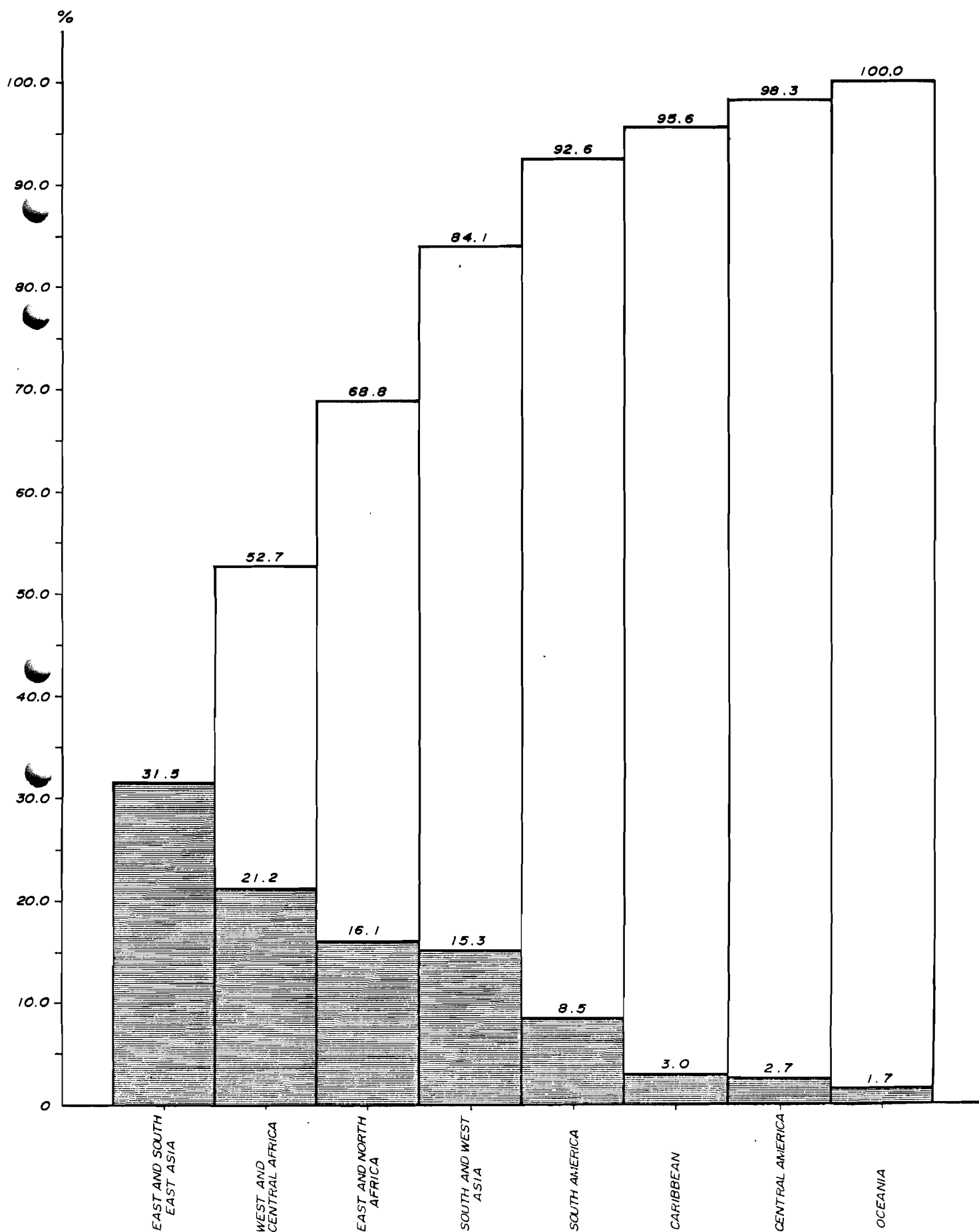
The grants awarded by the Foundation will be examined in terms of several categories of analysis, comprising geographical distribution, distribution according to the scientific and technological level of the recipient countries, relative weight of scientific areas in the various regions, status of the grants, grant renewals, average size of the grants, structure of cost items of the grants, etc. A few general remarks on the nature of the grants completes this section.

Distribution of Grants by Region and Country

An analysis of the distribution of grants awarded by regions indicate that East and South East Asia, with 31.5% of the total amount of the resources provided IFS grants, is the largest beneficiary of the Foundation. West and Central Africa account for 21.2%, and together with East and South

* Note that 29 new grants formally approved, but never disbursed due to a variety of reasonable causes, are excluded.

CUMULATIVE TOTAL OF GRANTS APPROVED*(till December 1981)*SOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

DISTRIBUTION OF IFS GRANTS BY REGIONS

East Asia the two regions account for more than 50% of the total resources provided by the IFS. The other three regions -East and North Africa, South and West Asia, and Latin America (divided into three sub-regions)- account each about 15% of the total resources provided by the IFS. Lastly, Oceania accounts for only 1.7% of the total resources.

Considering broader regional areas, Asia concentrates 46.8%, Africa comes second with 37.3%, while Latin America and the Caribbean account for 14.2% of the resources provided by the Foundation. Thus, Asia receives more than three times than Latin America and the Caribbean, while Africa receives more than twice the corresponding amount for Latin America and the Caribbean.

In principle, there is no reason why there should be an equitable geographical distribution of the resources, although there appears to be a need for expanding IFS operations in Latin America and the Caribbean. Possible reasons for the relative lack of involvement of the IFS in the region are: the fact that the Foundation does not have a Spanish speaking Project Secretary and does not process applications in Spanish; that the contacts between the IFS and the region have been sporadic; and that Scandinavian and Northern European countries have been traditionally involved with Africa and Asia.

Breakdown of Grants awarded by Country within Regions

To examine the degree of concentration of awards in countries within each region and the level of scientific development of the main recipient countries, an analysis was made of the number of countries that account for a certain percentage of the resources allocated to IFS grantees, and of the number

of authors publishing in international scientific journals each of these countries in 1980.*

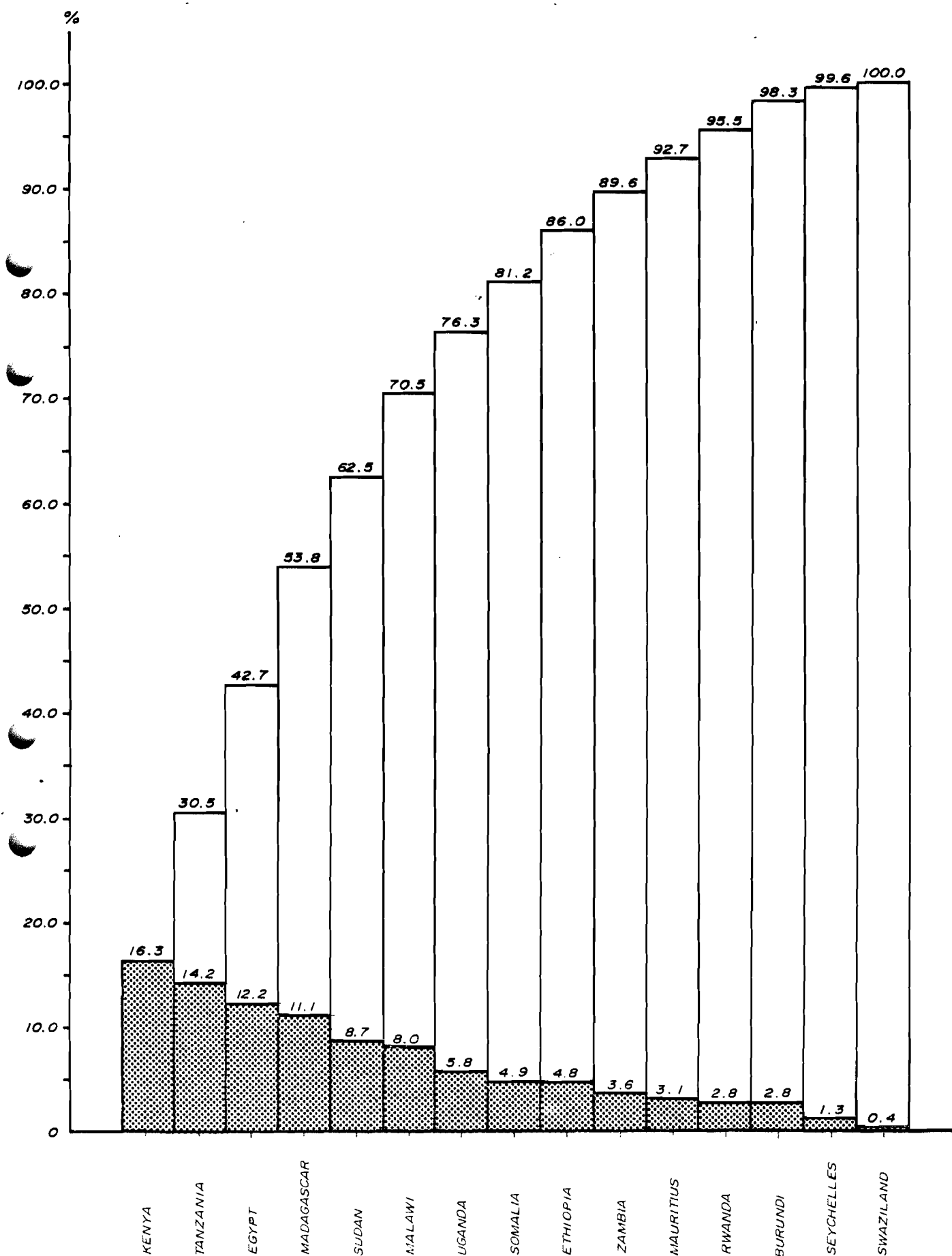
Within West and Central Africa, three countries -Nigeria, Ghana, and Ivory Coast- account for nearly 50% of the resources provided to IFS grantees, while another 13 countries account for the rest. These three countries are among the top four in that region in terms of number of scientific authors, with Nigeria having 878 authors, Ivory Coast 84, and Ghana 71. Morocco with 92 authors is the only country included in the second group of thirteen countries that do not receive a substantive amount of resources through IFS grants (Figure N°7). It is also worthwhile noticing that Nigeria and Ghana are the countries in this region that spend the largest amount in research and development and have the largest scientific manpower.

Within the East and North African region, Kenya, Tanzania, Egypt and Madagascar, concentrate 53.8% of the total resources channelled by the IFS, while eleven other countries account for the rest (Figure N°8). Kenya, Egypt and Tanzania are also among the countries with the largest number of scientific authors in this region, and spend the highest amount of resources in research and development.

Within the South American region (excluding Central America and the Caribbean) Perú, Colombia and Chile, account for 78.4% of the resources provided by IFS grants, while six countries account for the remainder. It is interesting to notice that within this region neither Argentina nor Brasil, which have the largest number of scientific authors, receive a large proportion of the resources

* The information on authors was provided by the Institute for Scientific Information in Philadelphia.

EAST AND NORTH AFRICA: DISTRIBUTION OF IFS GRANTS BY COUNTRIES.



SOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

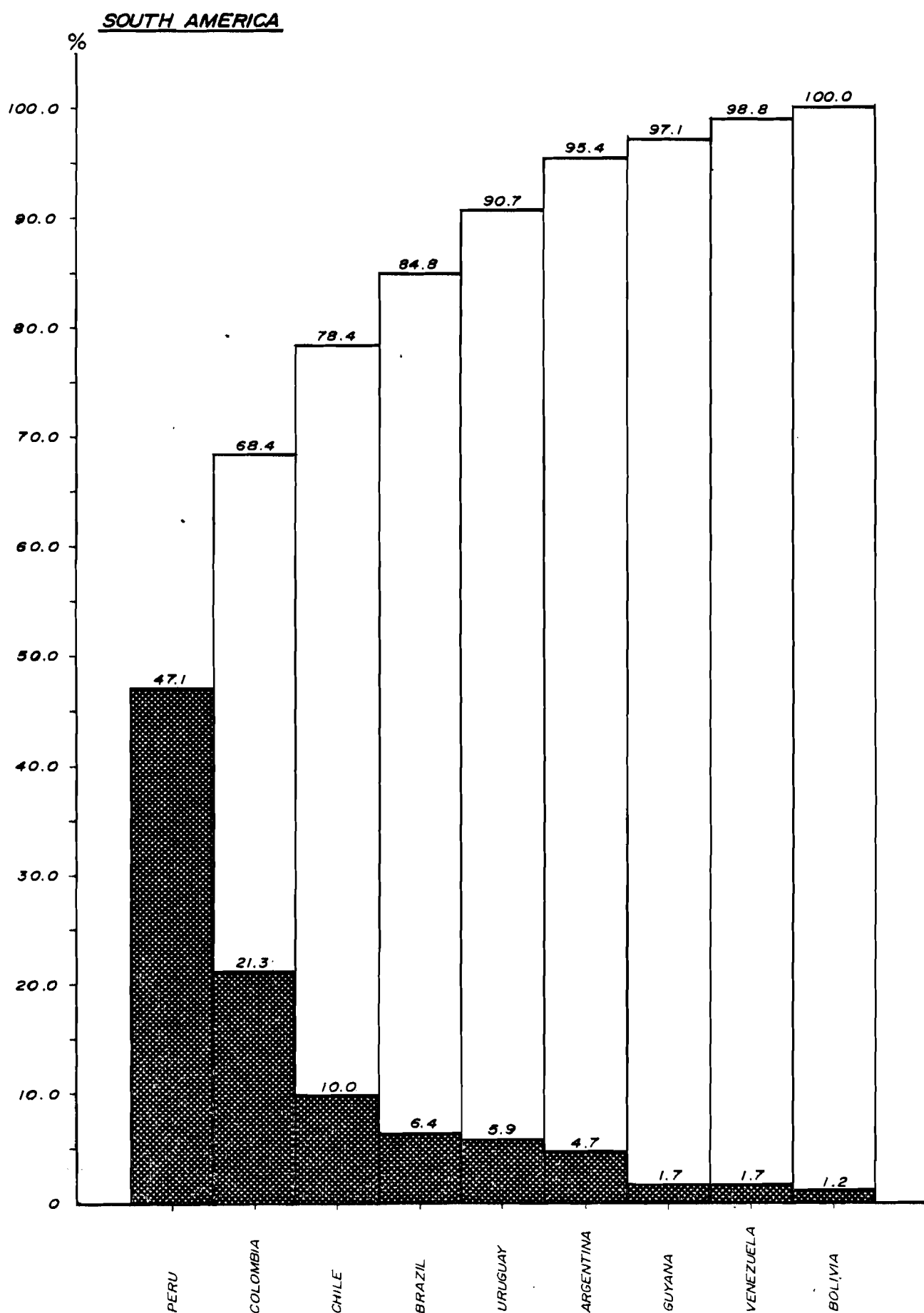
channelled through IFS grants. The countries receiving the largest proportion of IFS grants in the region are those with a middle-size scientific community, an impression that is confirmed by examining the figures on R & D expenditures and manpower.

Turning to the South and West Asia region, four countries -India, Sri Lanka, Bangladesh and Pakistan- account for 90.7% of the resources channelled through IFS grants, and these are quite diversified with regard to the scientific and technological capacity. Excluding India, which accounts for 37.8% of the grants and is one of the countries in the world with the largest number of scientific authors in 1980 (10,741), the other countries have a relatively small scientific and technological community as measured by the number of scientific authors. Three other countries account for the rest of resources provided through IFS grants.

In the East and South East Asia region, four countries -Thailand, Philippines, Malaysia and Indonesia- account for 85% of the resources provided by the IFS to the grantees, while 7 countries account for the rest. These countries have between 84 and 303 scientific authors, which put them at the high end of the spectrum among countries supported by the IFS in terms of the number of scientific authors. It is interesting to notice that Taiwan and Hong Kong, which have a relatively high number of scientific authors in this region, are not among the top four recipients of IFS grants.

Finally, within the sub-region of Central America, it is possible to find Mexico concentrating 57.4% of the resources from IFS grants out of 4 countries, that are included in this sub-region; Cuba accounts for over 55%

DISTRIBUTION OF IFS GRANTS BY
COUNTRIES
(PERIOD 1974 - 1981)

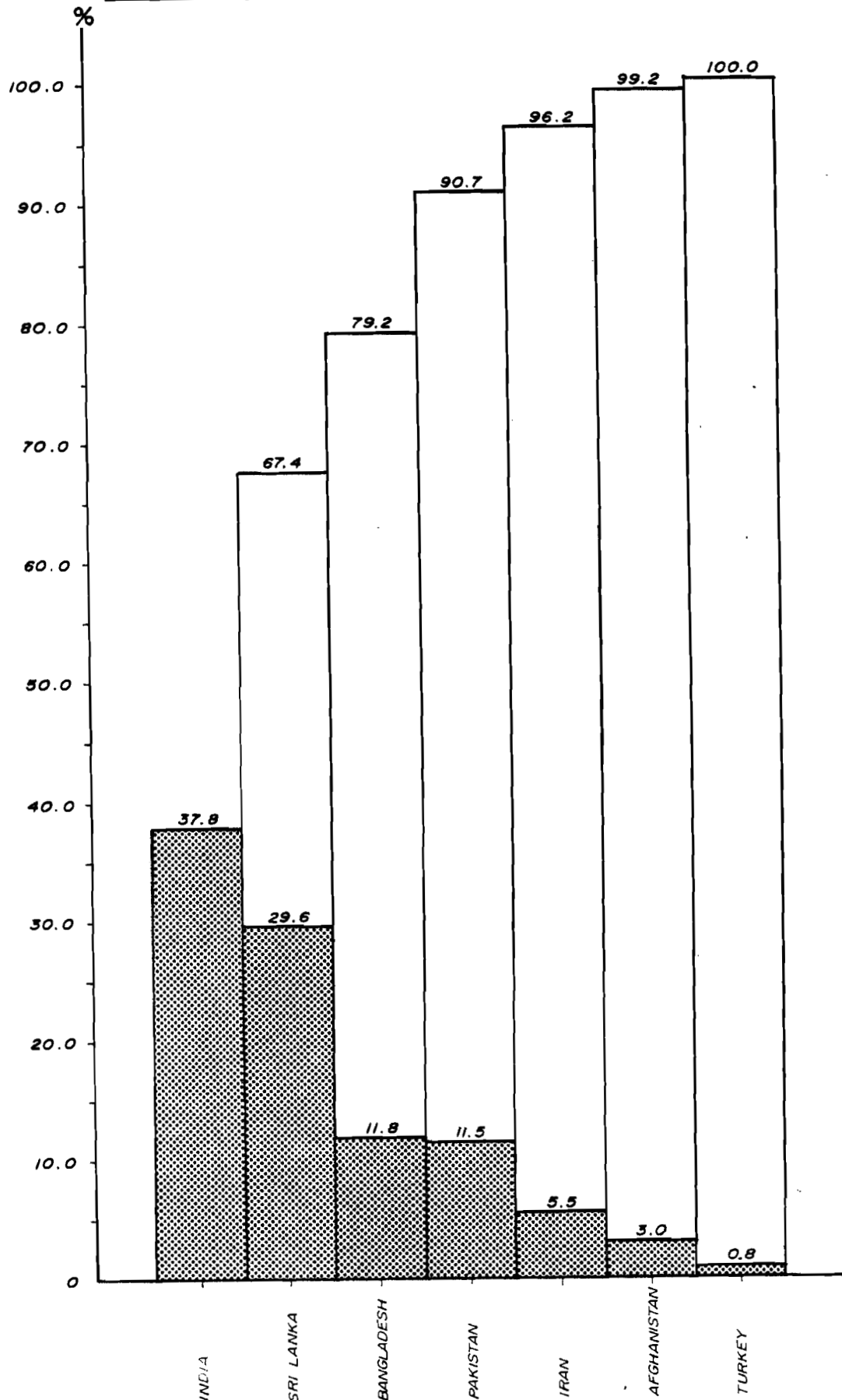


SOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

DISTRIBUTION OF IFS GRANTS BY
COUNTRIES

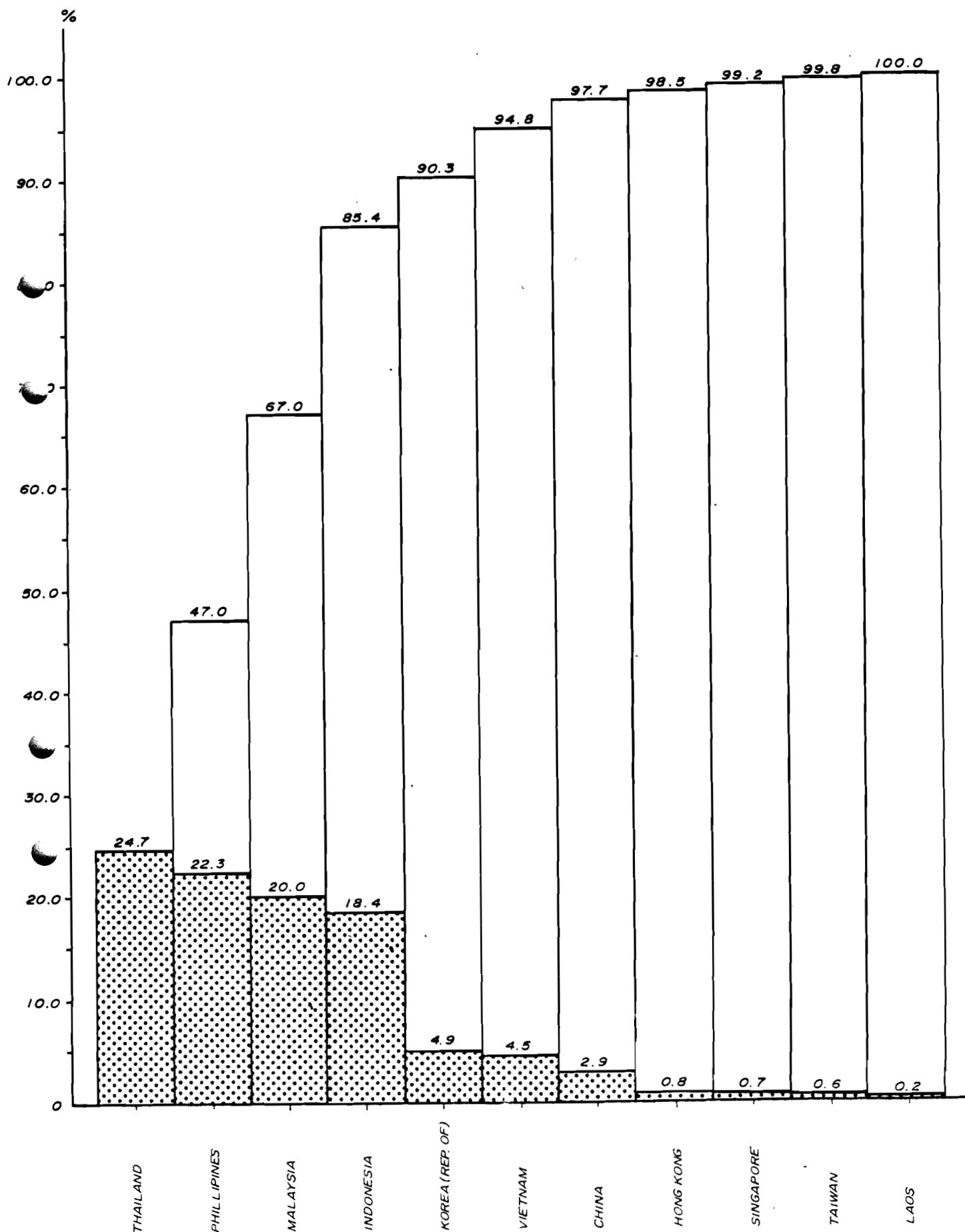
(PERIOD 1974-1981)

SOUTH AND WEST ASIA



SOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

EAST AND SOUTH EAST ASIA: DISTRIBUTION OF IFS GRANTS BY COUNTRIES



SOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

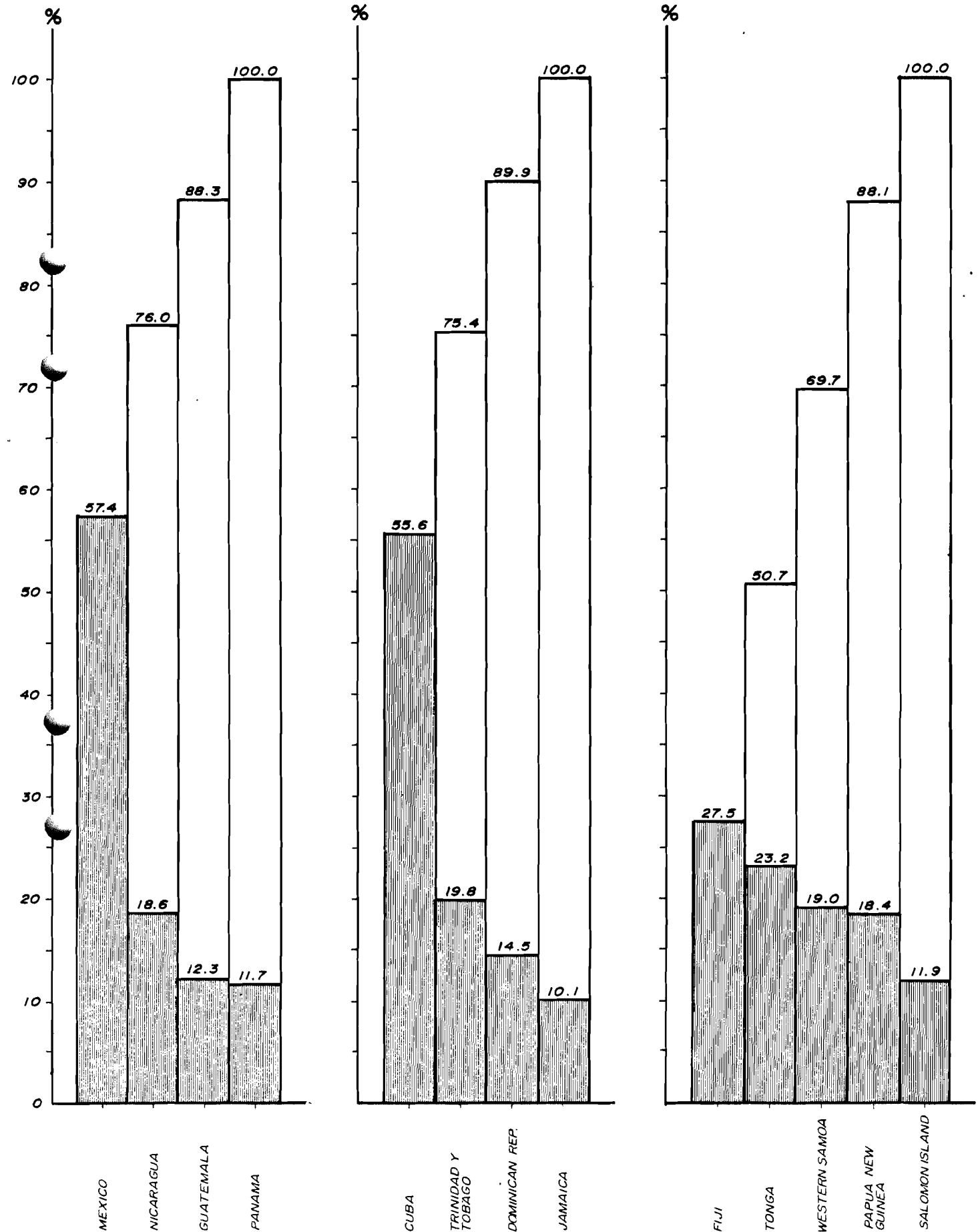
of the total grants provided to the Caribbean; while in Oceania two countries -Fidji and Togo account each for about half of the resources received through IFS grants. Excluding Mexico and Jamaica which have 936 and 111 authors, respectively, all the countries in these three sub-regions have less than 100 scientific authors in 1980.

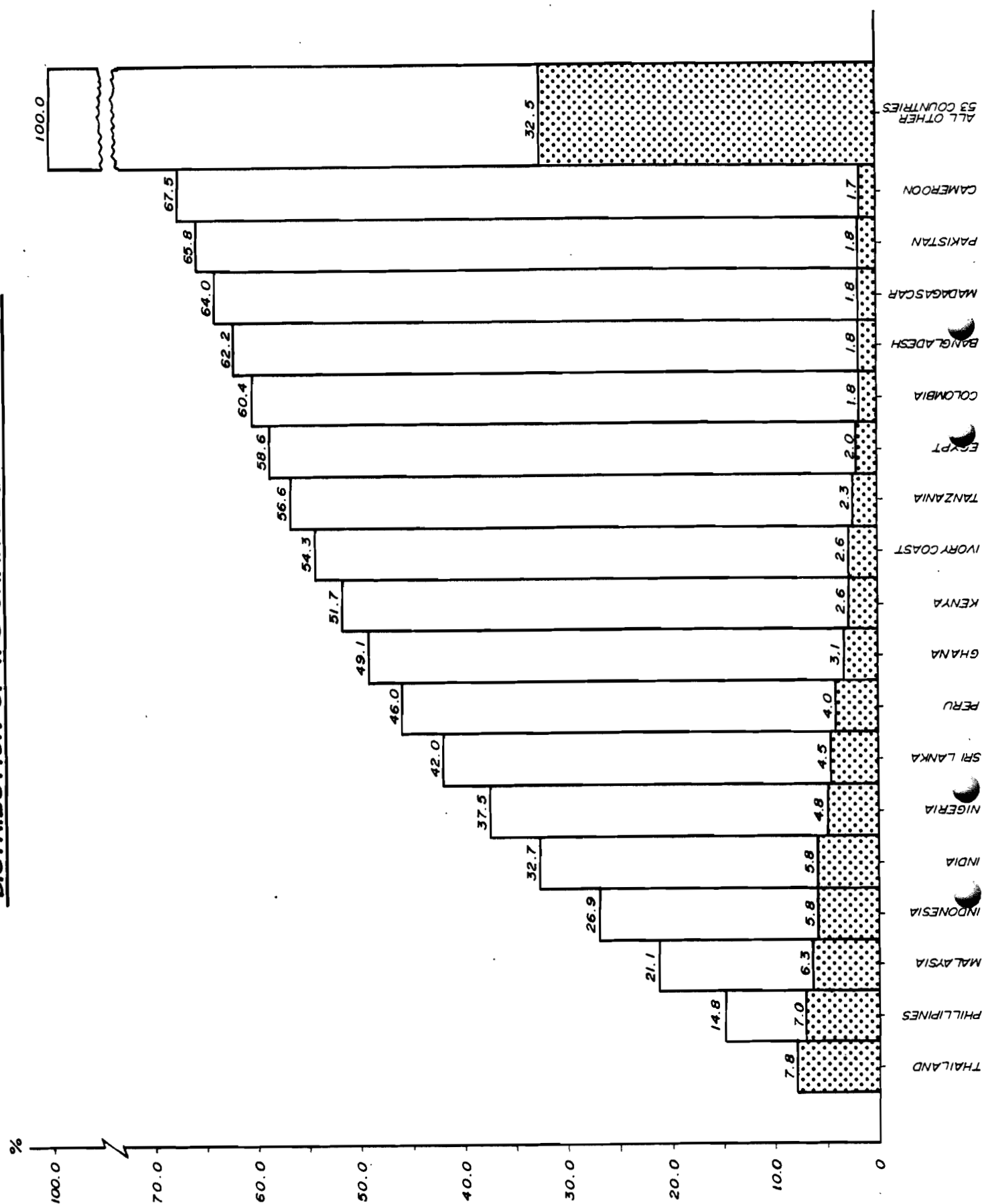
Distribution of IFS Grants on a Global Scale

Considering now the distribution of resources through grants to countries on a global scale, without dividing them into regions and sub-regions, it is possible to observe that 10 countries account for half of the resources provided by IFS grants, in the period 1974-1981. These 10 countries are:

- Thailand	7.8%
- Philippines	7.0%
- Malaysia	6.6%
- Indonesia	5.8%
- India	5.8%
- Nigeria	4.8%
- Sri Lanka	4.5%
- Peru	4.0%
- Ghana	3.1%
- Kenya	2.6%
T O T A L	<u>51.7%</u> =====

It can be observed that no country accounts for more than 8% of the total resources provided by IFS grants. The regional origin of these countries confirms the impression that Asia receives the largest proportion of IFS resources, with six countries in the list of 10, Africa follows with 3, and Latin America is present with only 1.

DISTRIBUTION OF IFS GRANTS BY COUNTRIES**(PERIOD 1974 - 1981)****CENTRAL AMERICA****CARIBBEAN****OCEANIA**SOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

DISTRIBUTION OF IFS GRANTS BY COUNTRIESSOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

T A B L E N ° 5

PERCENTAGE DISTRIBUTION OF GRANTS BY REGION AND YEAR

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>TOTAL</u>
West Africa	24.4	11.5	20.2	8.2	28.3	24.4	24.7	17.1	20.2
East Africa	17.1	21.2	25.3	13.1	18.3	9.0	7.5	19.8	15.9
West & South Asia	19.5	21.2	16.5	24.6	13.4	6.4	18.3	17.1	16.7
South East Asia	26.8	28.8	32.9	27.9	20.0	38.4	38.7	35.5	32.2
Latin America	12.2	17.3	5.1	26.2	20.0	21.8	10.8	10.5	15.0
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

R A N K I N G S

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>TOTAL</u>
West Africa	2	5	3	5	1	2	2	3	2
East Africa	4	2	2	4	4	4	5	2	4
West & South Asia	3	2	4	3	5	5	3	3	3
South East Asia	1	1	1	1	2	1	1	1	1
Latin America	5	4	5	2	2	3	4	5	5

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

If we examine the evolution of the regional distribution of the number of grants over time, using regional categories with higher degree of aggregation, as employed by Herlofson and Romhed in the statistical report on IFS grantees*, it is possible to see a fairly consistent pattern of regional distribution of grants over time. Throughout the period 1974-1981 South East Asia receives the largest number of grants, except in 1978 when it drops to the second position among the regions. West Africa remains mostly in the second place and rises to first in 1978, dropping to fifth in 1975 and 1976. This shows an apparent effort around 1978 to increase the participation of West Africa in the distribution of IFS grants.

Latin America is the region that is usually in the last place in terms of number of IFS grants, except in 1977 and 1978 when there appears to have been an effort to incorporate a larger number of Latin American grantees. East Africa remains next to last for most of the period under analysis, while West and South Asia remain in a middle position all along.

Distribution of Grants according to the Level of Scientific Development of the Recipient Countries

In order to examine the relation between the number of IFS grantees in a given group of countries and their level of scientific and technological development, an attempt was made to classify the countries according to several variables, such as scientific and technical manpower,

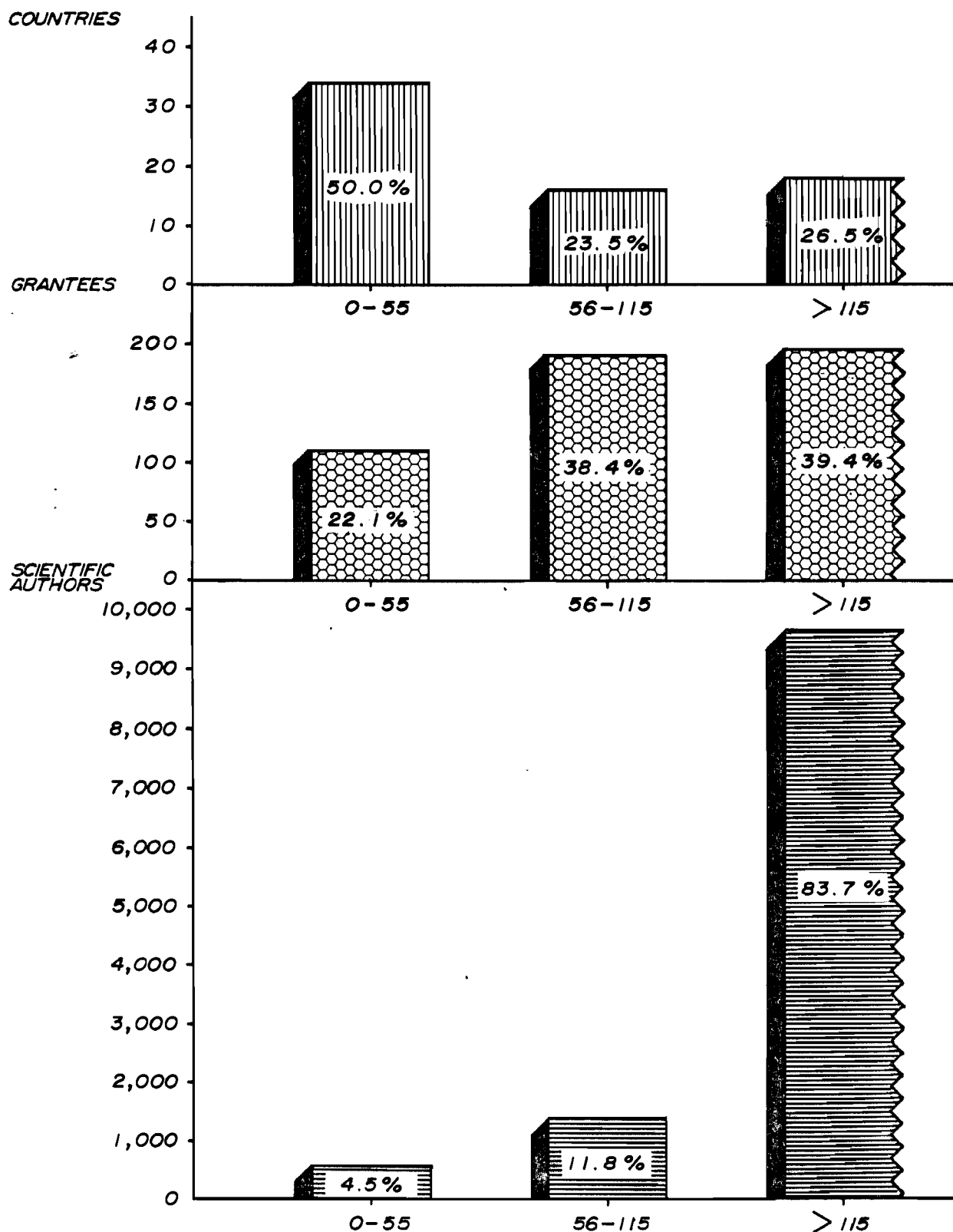
* N. Herlofson, M. Sedlacek and R. Romhed, IFS Review 1974-1981: Statistical Information, Stockholm, IFS Secretariat, June 1982.

R & D expenditures, percentage of GNP devoted to R & D. Because of the lack of recent and reliable information, and because it has been widely used as an indication of scientific capability, it was decided to use the number of scientific authors publishing in international journals in 1980 as compiled by the Institute for Scientific Information of Philadelphia. The number of scientific authors has been considered as a proxy variable representing the country's participation in the international scientific and technological effort.

An attempt was made to fit a curve relating the number of IFS grantees to the number of scientific authors, but the figures obtained did not show a clear pattern of statistical significance. Rather, it was possible to observe three clusters of countries in terms of these two variables, and this led to a classification of countries into three categories in terms of their scientific capability: those that have less than 55 scientific authors; those that have between 56 and 115 authors; and those countries that have more than 115 scientific authors.

According to Figure N°14, 50% of the countries with at least one IFS grantee belong to the first category, which accounts for 22.1% of the IFS grants. Considering the total number of scientific authors of all countries that have received at least one IFS grant, the proportion of authors belonging to this category represents 4.5% of the total. This gives an overall average of 3.2 grants per country in this category and of 15.1 scientific authors. Furthermore, it is worthwhile to notice that 32% of the countries receiving IFS grants have less than 5 grantees. This appears to indicate an effort in the part of the IFS to support a few researchers in a large number of countries with an incipient scientific community.

**COUNTRIES AND GRANTEES BY
CATEGORIES ACCORDING TO THE NUMBER OF SCIENTIFIC
AUTHORS IN 1980**



SOURCE: Directory of IFS Grantees; UNESCO Statistical Yearbook 1981; Data from the Institute for Scientific Information, Philadelphia; processed by the Evaluation Panel

The countries that have between 56 and 115 scientific authors account for 23.5% of the countries that have received IFS grants, and concentrate 38.4% of the total number of grantees. This would indicate that the approximately 25% of countries belonging to this category account for nearly 40% of the grants. It is also worthwhile that this group of countries account for 11.8% of the total number of scientific authors. The average number of grants per country in this category is 11.9, while the average number of scientific authors per country reaches 85.1. This would appear to indicate an effort in the part of the IFS to reach for a relatively larger number of grantees in a smaller number of countries with a middle-size scientific community.

The third group of countries, comprising those with 115 or more scientific authors, accounts for 26.5% of the total number of countries with IFS grants, and for 39.4% of the grantees, but they account for 83.7% of the number of scientific authors. India, with more than 10,000 scientific authors, has been excluded from this analysis because it would distort the overall pattern of distribution of scientific authors.

This implies that the countries with a relatively more developed scientific community (more than 115 scientific authors) receive approximately the same number of grants and account for approximately the same number of countries as those in the middle level (with 56 or more and 115 or less scientific authors). The average number of grants per country in the third category is 10.9, while the average number of authors per country is 535.9 (excluding India).

The countries in the category with more than 115 scientific authors, show a wide dispersion in the number of grants and in the number of scientific authors, while dispersion diminishes for the second category (56-115 scientific authors), and is smallest for countries with less than 55 scientific authors. However, considering the three groups of countries, it is possible to identify an overall trend in the direction of a larger number of grants being allocated to countries with a larger number of scientific authors, even though there is no statistical significance associated with this trend.

In terms of the regional presence in the groups of countries, 63% of the African countries that have received IFS grants have less than 9 grantees and have less than 55 scientific authors. By contrast, only 18% of the Asian countries have received less than 9 grants and have 55 authors or less, while 47% of the countries of Latin America and the Caribbean are found in the area ranging between 0 and 9 grants and up to 55 scientific authors.

In general, it is possible to derive the conclusion that the countries with a very low scientific capacity receive few grants, with the majority receiving less than 5 and with no country receiving more than 9 grants. The countries with a middle-size scientific community have a relatively large number of grants, with practically all countries in this category receiving more than 5 grants per country. Finally, those countries with a relatively large scientific community show a wide dispersion with regard to the number of grants they have received.

As a conclusion, it would be possible to say that the IFS has made efforts to cover a large number of countries with a relatively small scientific community, particularly

in the case of the African region, while the bulk of IFS grantees in this region (nearly 80%) are to be found in countries with relatively higher levels of scientific capacity. This is probably due to the nature of IFS grants, which require at least a minimum level of development of the scientific community in a given country for it to generate applications suitable for the IFS consideration.

Distribution of Grants by Scientific Area and Region

Examining the distribution of grants according to the scientific areas in which the International Foundation for Science provides support (aquaculture, animal production, vegetables, mycorrhiza, fermentation, natural products, and rural technology) and to the geographical regions to which the grantees belong, it is possible to appreciate a certain correspondence between scientific areas and regions in terms of the number of grants. For example, in Latin America and South East Asia the field of aquaculture accounts for the larger number of grants, while in the other regions the number of grants in this field takes the fourth place among the seven scientific areas.

In East Africa, animal production and natural products are the fields with the largest number of grants while in West Africa the scientific area of vegetables takes the first place. The relatively small size of the mycorrhiza, fermentation and rural technology areas is reflected in the small percentage of grants these areas account for in all regions, with the exception of fermentation in South East Asia (see Table N°6).

T A B L E N ° 6

PERCENTAGE DISTRIBUTION OF GRANTS BY

SCIENTIFIC AREA WITHIN REGION

SCIENTIFIC AREA REGION	<u>ACQUA- CULTURE</u>	<u>ANIMAL PRODUCTION</u>	<u>VEGETABLES</u>	<u>MYCORRHIZA</u>	<u>FERMEN- TATION</u>	<u>NATURAL PRODUCTS</u>	<u>RURAL TECHNOLOGY</u>	<u>TOTAL</u>
West Africa	11.6	18.8	37.7	8.7	5.8	15.9	1.5	100.0
East Africa	11.3	28.3	18.9	7.5	1.9	28.3	3.8	100.0
West & South Asia	21.4	13.3	13.3	9.3	9.3	30.7	2.7	100.0
South East Asia	21.6	9.8	19.6	7.7	16.1	18.2	7.0	100.0
Latin America	34.6	25.0	13.5	1.9	9.6	15.4	0.0	100.0
T O T A L	20.1	16.6	20.7	7.4	10.2	21.2	3.8	100.0

R A N K I N G S

West Africa	4	2	1	5	6	3	7
East Africa	4	1	3	5	7	1	6
West & South Asia	4	3	3	5	5	1	7
South East Asia	1	5	2	6	4	3	7
Latin America	1	2	4	6	5	3	7
T O T A L	3	4	2	6	5	1	7

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

Considering the distribution of the grants by regions within each scientific area (Table No. 7), it is possible to observe that South East Asia accounts for the largest number of grants in all the scientific areas, with the exception of animal production, in which East Africa takes the lead. West and South Asia take second place in the number of grants received in four of the scientific areas, drop to third in two (vegetables and aquaculture) and to fifth place in the field of animal production. West Africa and East Africa show a mixed pattern with regard to the number of grants they receive in each of the scientific areas, while Latin America takes the second place in the field of aquaculture, third in the fields of animal production and fermentation, and comes last in the number of grants in all the other scientific areas.

It would be interesting to explore further the interactions between the regional distribution of grants and the distribution of scientific areas, and it appears that the connecting link between these two distributions may be the Project Secretaries who are in charge of the different programme areas and their regional affinities. Some remarks on this issue are made in Section 2.h.

T A B L E N ° 7

PERCENTAGE DISTRIBUTION OF GRANTS BY

REGION WITHIN SCIENTIFIC AREA

<u>SCIENTIFIC AREA</u> <u>REGION</u>	<u>ACQUA CULTURE</u>	<u>ANIMAL PRODUCTION</u>	<u>VEGETABLES</u>	<u>MYCORRHIZA</u>	<u>FERMEN- TATION</u>	<u>NATURAL PRODUCTS</u>	<u>RURAL TECHNOLOGY</u>	<u>TOTAL</u>
West Africa	10.1	20.0	32.1	20.7	10.0	13.3	6.7	17.6
East Africa	7.6	23.1	12.3	13.8	2.5	18.1	13.3	13.5
West & South Asia	20.3	15.4	12.3	24.1	17.5	27.7	13.3	19.1
South East Asia	39.2	21.5	34.6	37.9	57.5	31.3	66.7	36.5
Latin America	22.8	20.0	8.7	3.5	12.5	9.6	0.0	13.3
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

- 59 -

R A N K I N G S

West Africa	4	3	2	3	4	4	4	3
East Africa	5	1	3	4	5	3	2	4
West & South Asia	3	5	3	2	2	2	2	2
South East Asia	1	2	1	1	1	1	1	1
Latin America	2	3	5	5	3	5	5	5

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

Status of the IFS Grants

Table N° 8 indicates that as of the end of 1981 the IFS had awarded a total of 572 grants*, excluding renewals and considering 22 grants transferred from one grantee to another. In the same period, 71 grants were completed, representing approximately 12% of the grants awarded. There were also 72 grants awarded in 1974-1980, about which no progress reports had been received as of May 1981. This is practically the same number of completed grants, which would indicate a need for closer monitoring and follow-up of grantees.

The regional and annual distribution of completed grants is shown in Table N° 9. It indicates that starting in 1976, when only 1 grant was completed, the number of completed grants has been continuously increasing, reaching 19 in 1981. Partial data for 1982 shows that 3 grants were completed in the first three months. East and South East Asia is the region with the largest number of completed grants, Latin America follows next, and the other regions come behind.

It is also interesting to notice that only 22 grants were transferred from the original grantee to another, which represents approximately 4% of the 572 grants awarded. America and Oceania account for the largest number of transferred grants, followed by West Africa, East and South East Asia and East Africa. In South and West Asia there were no grants transferred from one grantee to another. In general, these figures indicate

* The difference between the number of grants awarded (572) and approved (578) is due to the fact that some grants approved were not initiated by the grantee.

T A B L E N ° 8

OVERALL SUMMARY OF GRANT STATUS

(as of the end of 1981) (1)

- Total number of grants awarded (excluding renewals and considering 22 grants transferred)	572
- Total number of completed grants	71
- 1974 1980 grants on which no progress reports were available as of May 1981	72 (2)

Sources: (1) Directory of Grantees 1981, IFS, September 1982

(2) IFS Work 1974-1980, May 1981

T A B L E N ° 9

C O M P L E T E D G R A N T S

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982*</u>	<u>TOTAL</u> <u>Number</u>	<u>%</u>
West Africa	0	3	3	2	4	2	0	14	19.7
East Africa	0	0	0	3	5	2	0	10	14.1
West & South Asia	0	1	0	2	4	1	0	8	11.3
South East Asia	1	3	2	4	0	10	2	22	31.0
America	0	3	1	7	1	4	1	17	23.9
T O T A L	<u>1</u>	<u>10</u>	<u>6</u>	<u>18</u>	<u>14</u>	<u>19</u>	<u>3</u>	<u>71</u>	<u>100.0</u>

NOTE: * partial data for 1982

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel
Directory of Grantees 1981, IFS, September 1982

T A B L E N° 10

GRANTS TRANSFERRED TO OTHER GRANTEES

		<u>%</u>
West Africa	6	27.3
East Africa	3	13.6
West & South Asia	0	0.0
South East Asia	5	22.7
Latin America	8	36.4
T O T A L	22	100.0

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review,
1974-1981, Statistical information, Provisional Report
2nd June 1982, processed by the Evaluation Panel
Directory of Grantees 1981, IFS, September 1982

that the transfer of grants from one grantee to another is a rather infrequent event, and should be no cause for concern.

Grant Renewals

Table No. 11 indicates the total number of grant renewals (considering first, second and third renewals) from 1974 to 1981. It is possible to observe that the number of renewals has increased rapidly between 1974, the first year of operation, and 1981, when 92 renewals were approved. The increase has been rather steady, even though in 1980 there was a reduction in the number of renewals in relation to the number corresponding to 1979.

The regional distribution of grant renewals over time (Table No. 12) indicates that South East Asia has consistently been the region with the largest number of grant renewals, and accounts for 35.3% of the total renewals. At the other extreme, East Africa and Latin America account each for about 14% of the total number of renewals, while West Africa and West and South Asia account for 18.4% and 17.2%, respectively. Notice that South East Asia has approximately twice the number of grant renewals than the next region, West Africa.

The distribution of renewals by scientific area (Table No. 13) shows that the area of vegetables accounts for the largest number of renewals (80), followed by natural products (72) and aquaculture (67). The areas of animal production (48), fermentation (41), and mycorrhiza (24) come next, with rural technology having only 5 renewals out of a total of 337.

T A B L E N ° 11

TOTAL NUMBER OF GRANT RENEWALS PER YEAR

<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>TOTAL</u>
0	13	11	34	48	84	55	92	337

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974- 1981,
Statistical information, Provisional Report 2nd June 1982, processed
by the Evaluation Panel

T A B L E N ° 12

EVOLUTION OF THE GEOGRAPHICAL DISTRIBUTION OF GRANT RENEWALS

(Percentages of Grant Renewals in a given Year)

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>TOTAL</u>
West Africa	---	46.1	0.0	2.9	22.9	10.7	27.3	21.7	18.4
East Africa	---	7.7	18.2	32.4	22.9	10.7	14.5	6.5	14.3
West & South Asia	---	7.7	27.3	26.5	14.6	17.9	16.4	15.2	17.2
South East Asia	---	38.5	45.4	29.4	27.1	41.7	30.9	37.0	35.3
Latin America	---	0.0	9.1	8.8	12.5	19.0	10.9	19.6	14.8
T O T A L	---	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information,
Provisional Report 2nd June 1982, processed by the Evaluation Panel

T A B L E N ° 13

TOTAL NUMBER OF RENEWALS BY SCIENTIFIC AREA (1974-1981)

<u>ACQUA- CULTURE</u>	<u>ANIMAL PRODUCTION</u>	<u>VEGETABLES</u>	<u>MYCORRHIZA</u>	<u>FERMEN- TATION</u>	<u>NATURAL PRODUCTS</u>	<u>RURAL TECHNOLOGY</u>	<u>TOTAL</u>
67	48	80	24	41	72	5	337

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

An analysis of the distribution of grant renewals by region within scientific area confirms the patterns observed for the award of new grants, with a few slight modifications. In effect, South East Asia accounts for the largest number of renewals in all scientific areas except animal production and vegetables, where it takes second place. West Africa has the largest number of renewals in the area of vegetables, and Latin America holds the same position with regards to animal production. East Africa is the region that has the lowest number of grant renewals in the fields of aquaculture and mycorrhiza. West and South Asia has the second largest number of renewals in the areas of natural products, rural technology and aquaculture, but drops the fifth place in the field of animal production. (Table N°14)

During the statistical analysis of IFS grantees, Herlofson et al identified an interesting pattern of the behaviour of grant renewals: they appear to follow a specific distribution that is a function of the age of the grant. In this way, it would be possible to predict the number of grant renewals for successive time periods as the basis of the number of new grants in a given time period. These findings should be explored further, for they have the potential of becoming a most useful budget planning tool.*

Size of IFS Grants

The distribution of grant sizes for new grants is shown in Figure N°15. The average size for new grants is around US\$6,400, with the largest number of grants accounted for in the range between 5.6 and 6.5 thousands

* See N. Herlofson et al, IFS Review 1974-1981, Statistical information, supplementary report, 22nd June 1982.

T A B L E N ° 14

PERCENTAGE DISTRIBUTION OF GRANT RENEWALS
BY REGION WITHIN SCIENTIFIC AREAS

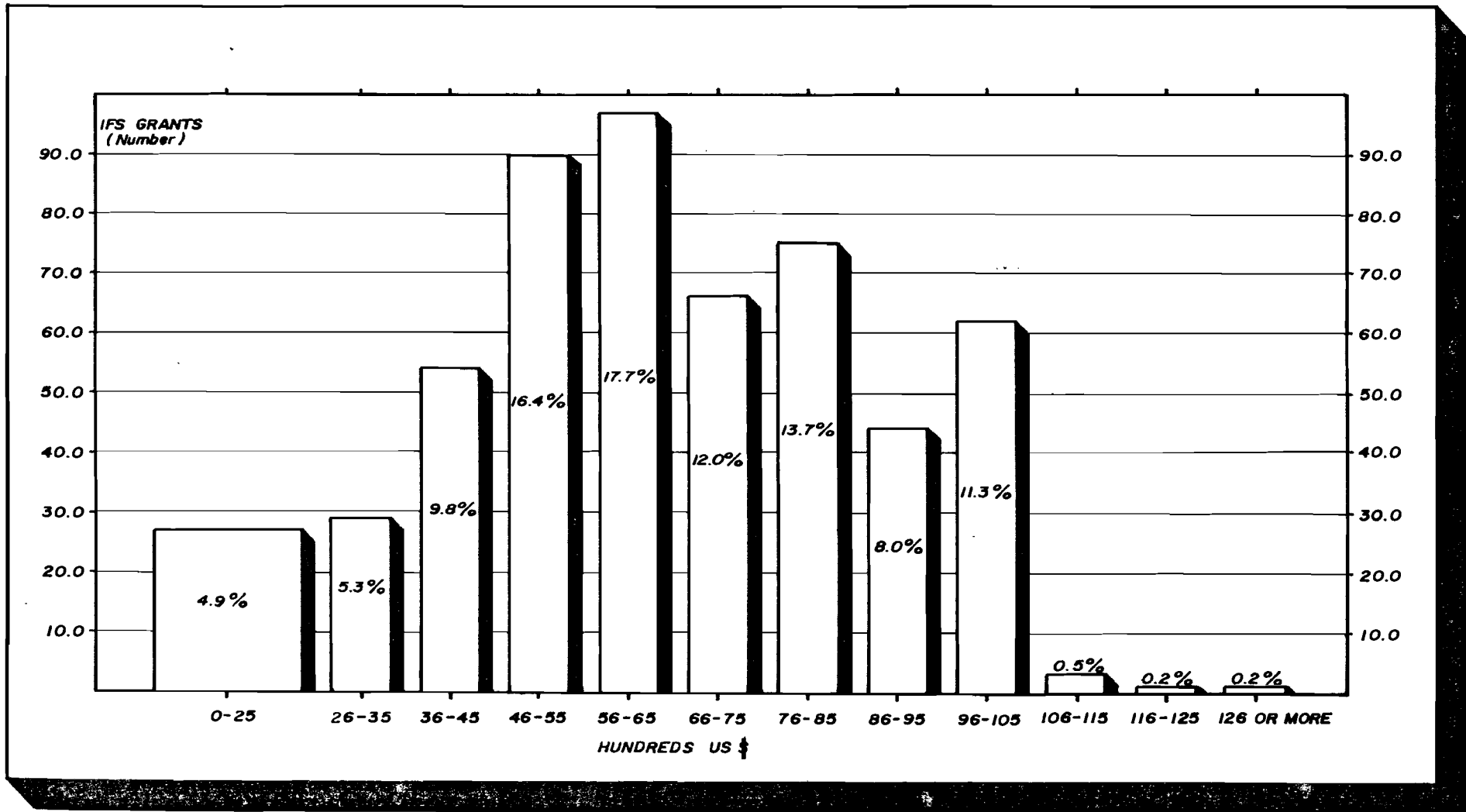
SCIENTIFIC AREA REGION	<u>ACQUA- CULTURE</u>	<u>ANIMAL PRODUCTION</u>	<u>VEGETABLES</u>	<u>MYCORRHIZA</u>	<u>FERMEN- TATION</u>	<u>NATURAL PRODUCTS</u>	<u>RURAL TECHNOLOGY</u>	<u>TOTAL</u>
West Africa	11.9	14.6	37.5	25.0	4.9	12.5	0.0	18.4
East Africa	4.5	22.9	10.0	8.3	12.2	26.4	0.0	14.3
West & South Asia	28.4	6.3	11.3	16.7	7.3	26.4	20.0	17.2
South East Asia	37.3	22.9	32.5	37.5	58.5	29.2	60.0	35.3
Latin America	17.9	33.3	8.7	12.5	17.1	5.5	20.0	14.8
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

R A N K I N G S

West Africa	4	4	1	2	5	4	4	2
East Africa	5	2	4	5	3	2	4	5
West & South Asia	2	5	3	3	4	2	2	3
South East Asia	1	2	2	1	1	1	1	1
Latin America	3	1	5	4	2	5	2	4

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1980, processed by the Evaluation Panel

DISTRIBUTION OF NEW IFS GRANTS ACCORDING TO GRANT SIZE

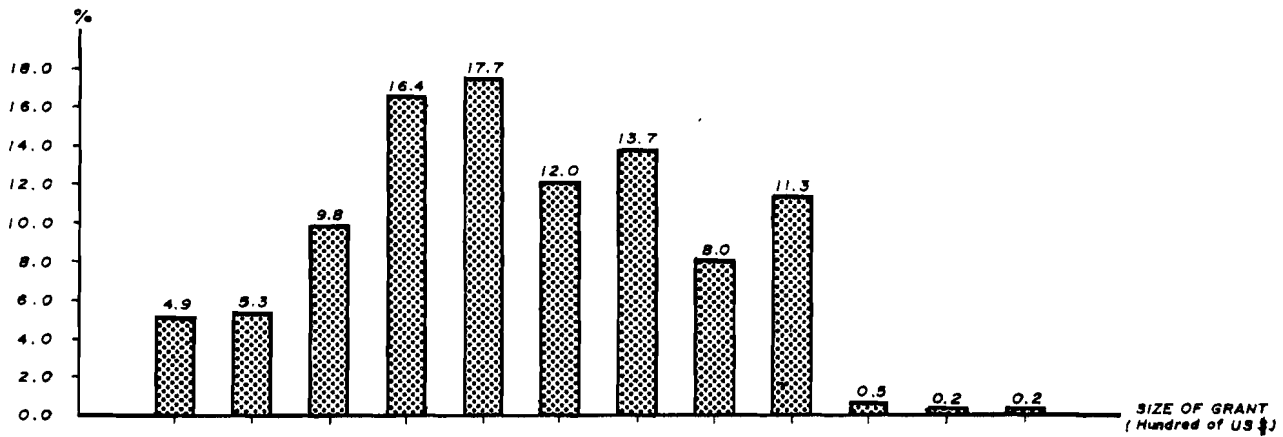


of U.S. dollars. There are very few grants, less than 1%, that exceed 10.5 thousands of U.S. dollars, and about 10% of the grants fall in the range below 3.5 thousands of U.S. dollars. This indicates that the IFS has kept the average size of grants well below the US\$10,000 per year limit.

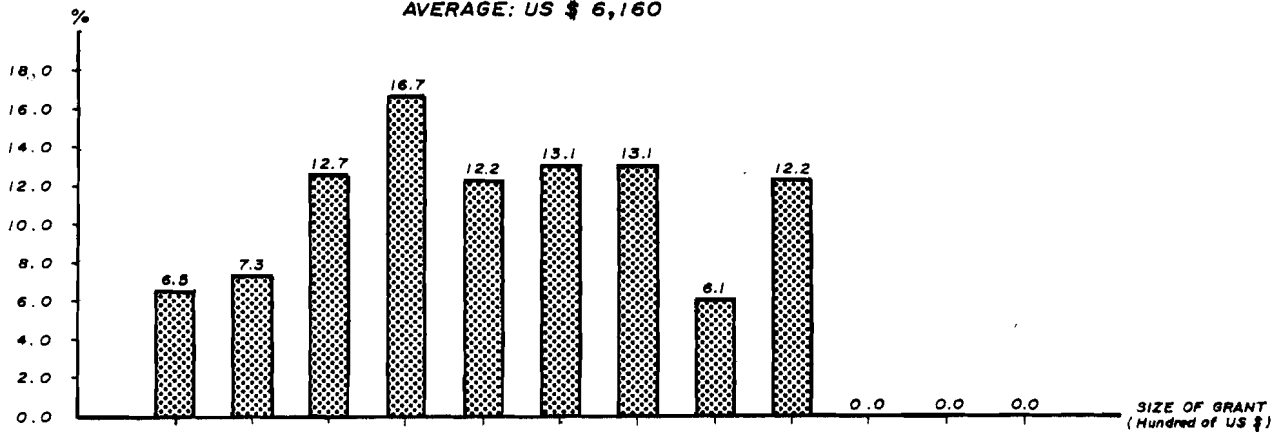
The size distribution of new grants and of the successive renewals show interesting differences (Figure N°16). In effect, while the average size of a first grant, first renewal, second renewal and third renewal remain approximately in the same range (US\$6.16-6.6 thousand), the shape of the distribution varies significantly between the first grant and the third renewal. From a roughly unimodal distribution of new grants, as the grantee proceeds to his first renewal, to the second and to the third renewal, a distinct bimodality begins to emerge, to the extent that on the third renewal there are two clusters of grants, one below the US\$5.5 thousand range and another one above the US\$7.6 thousand mark, with no grants in between them. This means that there are no third renewal grants awarded for sums between US\$5.6 and US\$7.5 thousands. This bimodality may arise because of the different demands that the nature of the research imposes on the successive renewals. In effect, it could be that there is a group of grants requiring heavy investments in equipment at the beginning, and then need relatively less resources to cover running expenses; while there may also be grants that require a small initial outlay at the beginning, and increasing resources as research results are obtained and the grantee progresses towards his third renewal.

SIZE DISTRIBUTION OF AWARDED GRANTS

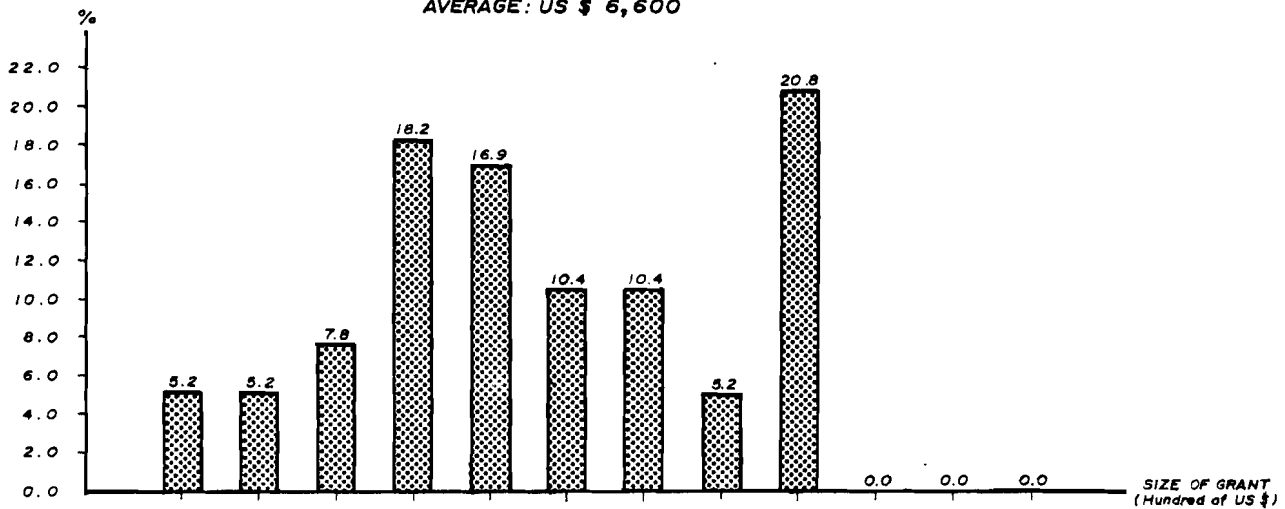
FIRST GRANT
AVERAGE: US \$ 6,420



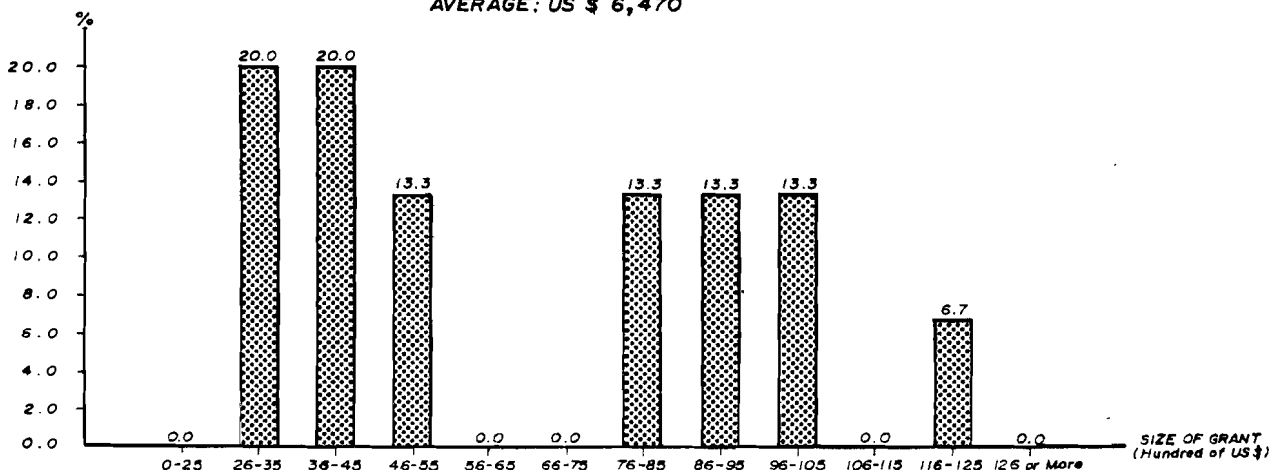
FIRST RENEWAL
AVERAGE: US \$ 6,160



SECOND RENEWAL
AVERAGE: US \$ 6,600



THIRD RENEWAL
AVERAGE: US \$ 6,470



Cost Items in a Grant

The IFS grants cover equipment, expendable supplies, library material, travel, salaries of assistants and technical personnel, and other miscellaneous expenses. It specifically excludes the salary of the researcher, which is paid by the institution of the grantee. The distribution of cost items in grants in a yearly basis is shown in Table No. 15, with detailed breakdowns available only as of 1976. Equipment expenses account consistently for over 50% of the total cost of a grant and represent the largest item, followed by expendable supplies, and travel. Library material, salaries of assistants and technical personnel and other expenses account each for a relatively small share of the cost of an IFS grant. Contrary to what could be expected because of inflation, which apparently affects the cost of equipment to a larger extent than other items, there has not been an appreciable increase in the percentage of the grant allocated to the purchase of equipment. For the six-year period between 1976 and 1981, the percentage of the grant spent in equipment has ranged from a low of 47.8% in 1981 to a high of 67.5% in 1977.

There does not seem to be a significant difference in the distribution of cost items according to scientific areas. In effect, Table No. 16 indicates that the structure of cost items remains practically the same for all scientific areas. This would indicate that the types of inputs and requirements for the conduct of research in the areas supported by the IFS are basically similar.

T A B L E N ° 15

PERCENTAGE DISTRIBUTION OF COST ITEMS IN GRANTS BY YEAR

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Equipment	---	---	50.4	67.5	57.1	58.5	62.4	47.8
Expendable Supplies	---	45.0	22.9	16.9	24.3	20.7	19.7	24.8
Library Material	---	---	3.8	5.0	5.1	4.1	4.7	5.2
Travel	---	---	7.0	6.3	5.4	7.0	5.8	10.7
Salaries	---	---	2.1	1.0	4.5	4.7	3.6	5.9
Other	---	55.0	13.8	3.3	3.6	5.0	3.8	5.6
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

T A B L E N ° 16

PERCENTAGE DISTRIBUTION OF COST ITEMS IN
GRANTS BY SCIENTIFIC AREA

	<u>ACQUA- CULTURE</u>	<u>ANIMAL PRODUCTION</u>	<u>VEGETABLES</u>	<u>MYCORRHIZA</u>	<u>FERMEN- TATION</u>	<u>NATURAL PRODUCTS</u>	<u>RURAL TECHNOLOGY</u>	<u>TOTAL</u>
Equipment	53.3	55.5	61.4	52.6	52.7	59.2	61.0	57.1
Expendable Supplies	22.0	26.9	15.8	19.2	24.5	25.0	15.1	21.6
Library Material	5.5	4.6	3.9	4.7	4.0	5.3	3.2	4.7
Travel	8.1	4.4	9.6	10.9	4.8	4.8	7.6	7.1
Salaries	5.1	2.3	6.0	5.8	4.4	0.6	5.9	3.9
Other	6.0	6.3	3.3	6.8	9.6	5.1	7.2	5.6
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

General Remarks on the Grants provided by the IFS

The preceding discussion, based on the statistical material made available to the Panel during the conduct of the evaluation, has opened up a series of interesting avenues for discussion and research. It is not possible to follow all of them, but a few selective and general remarks are in order regarding the implications of these findings and of the additional information gathered by the Evaluation Panel.

Developing countries with a minimum level of scientific and technological capabilities, with at least two or three decades of tradition in scientific research, with a scientific community in the process of expansion, and with a growing pool of recent post-graduate students, appear to be the countries where the IFS can operate most effectively. In terms of increase per capita and similar socioeconomic indicators, these countries usually belong to the middle-income category. In a sense, it is easier and less risky for the IFS to award grants in these countries and, as could be expected, a substantial proportion of IFS grantees are found in these countries that appear to be best suited to the IFS approach.

In contrast, there are countries with an extremely low level of scientific and technological capabilities, with practically no research tradition, with an incipient scientific community, and with a very small number of recent post-graduates who are generally co-opted into administrative and teaching positions. These countries would benefit greatly from a programme of grants designed to increase the number of qualified scientists and keep them doing research, linking them to the international scientific community. However, identifying the right persons to

support is likely to be more difficult and the risk of their leaving their research careers, or of not completing their research successfully, would be higher.

For example, the Project Secretaries and several Scientific Advisors mentioned that many African countries could benefit even more by the IFS granting programme but that it was difficult to identify potential applicants, and when they are identified, they have little support from the practically non-existent local scientific community, and from their academic or research institutions.

The Project Secretaries of the IFS have made an effort to balance the grants channelled to these two groups of countries. The personal contacts made by the Project Secretaries, and to a lesser extent by the Scientific Advisors, have counteracted the apparently natural tendency to privilege those countries best suited to the IFS approach. The large number of African countries that receive less than 9 grants is a clear indication of this balancing effort. Furthermore, the fact that the IFS awards small grants (average size US\$6.4 thousands) makes it possible to take more risks than would be possible with larger grants.

The present policy of giving priority to grant renewals which, in effect, transform the IFS awards into multiple-year grants as long as the researcher performs reasonably well, gives a young researcher the opportunity to complete the transition from obtaining a graduate degree to becoming an established member of the scientific community. At the end of his tenure, which may range from 1 to 4 grant periods, the IFS grantee should be in a position to contribute effectively to the advance of knowledge and to the solution of development problems through scientific research. He should have also

published papers and reports based on his research. The policy of keeping the number of renewals limited to three is adequate in the sense that if a researcher has not made the transition between graduate work and becoming an established member of the scientific community in that period he is not likely to do so in the future.

While the IFS awards individual grants, and usually does not approve applications for research that form an integral part of a larger project, the possibility of approving a "cluster of grants" around a common theme or problem area deserves to be explored. The grants would be independent, but would focus on different aspects of the same problem, thus forming a cluster of research efforts that may be more effective than a collection of isolated grants.

The average size of grants, US\$6,400, is well below the established maximum of US\$10,000 per year, and there are indications that allocations for some items like equipment may not be keeping pace with inflation. Several persons interviewed during the conduct of the evaluation mentioned that they thought allowances for equipment were too stingy, and that provision should be made for increases in the cost of equipment, as well as for covering the transport to the country of the grantee. Furthermore, it was also found that in many cases applicants tend to be too timid in their requests for funds.

The fact that the IFS does not pay the salary of the researcher has emerged as one of the keys to the success of the IFS. Virtually no one during the conduct of the evaluation suggested that this was not a desirable feature of the IFS style of operation, even though there were several grantees that suggested that a small supplement in salary may be of assistance, and should be considered by the IFS in exceptional circumstances.

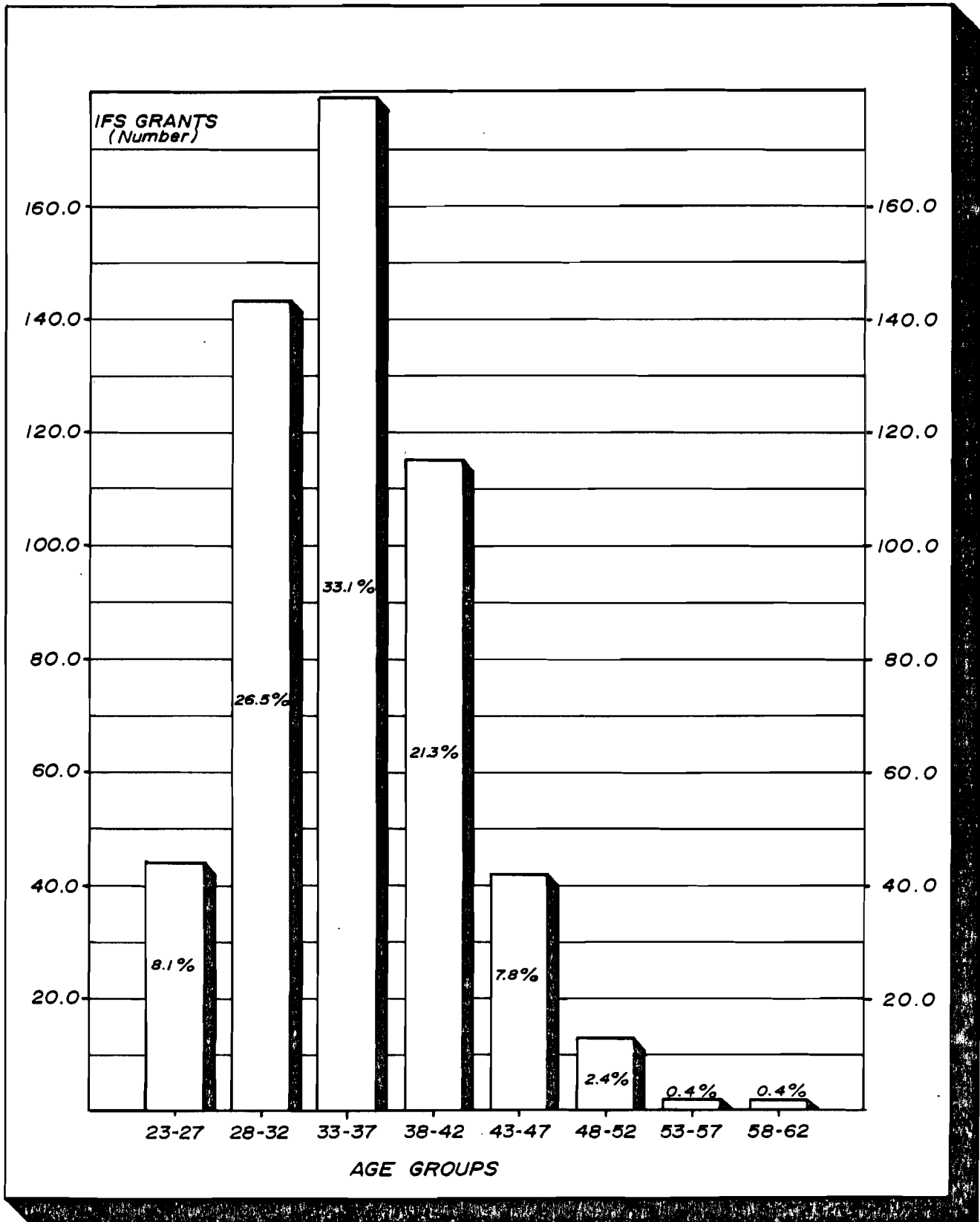
2.d. THE IFS GRANTEES

The main objective of the IFS is to provide support to young scientists in developing countries, helping them in the transition from obtaining a graduate degree to becoming full members of the international scientific community. In this regard, it is important to examine the general characteristics of the persons to whom the IFS has provided support during its 8 years of operation. This section examines the age of the grantees, their sex, their academic background, and their experience before being awarded an IFS grant.

The Age Distribution of Grantees

The age distribution of IFS grantees at the time the IFS grant is awarded is shown in Figure N°17. The average age of the grantees is 35.2 years, with more than 80% being between 28 and 42 years of age. Table N°17 shows the evolution of the age structure of grantees over time, and indicates that there is a remarkable stability in this structure. There is no apparent "aging" trend in the age structure of IFS grantees, which would imply that there is a large pool of potential beneficiaries of the IFS grants.

The age distribution of grantees according to region is shown in Table N°18, where certain regional differences can be observed. In effect, Latin America shows the largest proportion -more than twice the average for other regions- of grantees in the 23-27 years old range. East Africa has the largest number of grantees under 32 years of age, nearly 50% of its total grantees. On the other hand, West and South Asia is the region with the largest proportion of grantees 39 years of age,

NUMBER OF IFS GRANTEES BY AGE GROUPS

SOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

T A B L E N ° 17

AGE OF GRANTEES BY YEAR
(Percentages in each Age Interval)

<u>YEAR</u> <u>AGE</u> <u>INTERVAL</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>TOTAL</u>
23 - 27	19.5	1.9	6.3	8.2	8.3	6.4	7.5	10.5	8.1
28 - 32	24.4	44.2	31.6	23.0	26.7	32.1	14.0	22.4	26.5
33 - 37	29.3	21.2	32.9	37.7	33.3	38.5	32.2	35.5	33.1
38 - 42	22.0	25.0	20.3	18.0	18.3	12.8	26.9	26.3	21.3
43 - 47	2.4	5.8	6.3	11.5	8.3	7.7	12.9	4.0	7.8
48 - 52	2.4	1.9	1.3	1.6	3.4	2.5	4.3	1.3	2.4
53 - 57	0.0	0.0	1.3	0.0	1.7	0.0	0.0	0.0	0.4
58 - 62	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.4
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

T A B L E N ° 18

PERCENTAGE DISTRIBUTION OF AGE OF GRANTEES BY REGION

AGE INTERVAL REGION	<u>23-27</u>	<u>28-32</u>	<u>33-37</u>	<u>38-42</u>	<u>43-47</u>	<u>48-52</u>	<u>53-57</u>	<u>58-62</u>	<u>TOTAL</u>
West Africa	9.2	28.4	33.0	21.1	3.7	2.8	1.8	---	100.0
East Africa	5.8	41.9	33.7	14.0	4.6	---	---	---	100.0
West & South Asia	2.2	12.2	27.8	35.6	16.7	5.5	---	---	100.0
South East Asia	8.0	25.3	34.5	19.0	10.3	1.7	---	1.2	100.0
Latin America	16.1	25.9	35.8	18.5	1.2	2.5	---	---	100.0
T O T A L	8.1	26.5	33.1	21.3	7.8	2.4	0.4	0.4	100.0

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

with more than 55% of them in this age category. West Africa and South East Asia follow closely the age distribution of the total number of grantees.

These variations emerge probably because of the different stages in the development of the scientific community, and the differences in education in the countries supported in each of the regions. For example, it would appear that West and South Asian countries have a longer research tradition in the fields supported by the IFS, which is reflected in the relatively longer time it takes for "young scientists to apply for support to the IFS. On the other hand, it would appear that the Latin American countries are in the process of establishing a research capacity in the fields covered by the IFS, and the "young" scientists define their own projects and apply for grants at an earlier age.

In any case, the evidence indicates that the IFS has been reaching the intended population of "young" developing countries' scientists, as evidenced by the age distribution of grantees over time and across regions.

The Sex Distribution of Grantees

The International Foundation for Science has supported a large majority of male scientists, and women accounted for only 79 of the total of 572 grants awarded. Female grantees represent about 14% of the total, and this is a reflection of the sex bias in the scientific community of developing countries. Indeed, information obtained by the Secretariat on female grantees in South East Asia indicated that they faced greater

T A B L E N ° 19

GRANTEES ACCORDING TO SEX

	<u>Male</u>	<u>Female</u>	<u>TOTAL</u>
West Africa	108	6	114
East Africa	92	5	97
West & South Asia	82	9	91
South East Asia	130	41	171
Latin America	<u>81</u>	<u>18</u>	<u>99</u>
T O T A L	493	79	572

SOURCE: International Foundation for Science. Directory of Grantees 1981.

difficulties than their male counterparts, even though they represent nearly 24% of the grantees in that region. In the case of Africa, female grantees account for 5% of the total grants, and this figure rises to 11% in South and West Asia, and to 22% for Latin America.

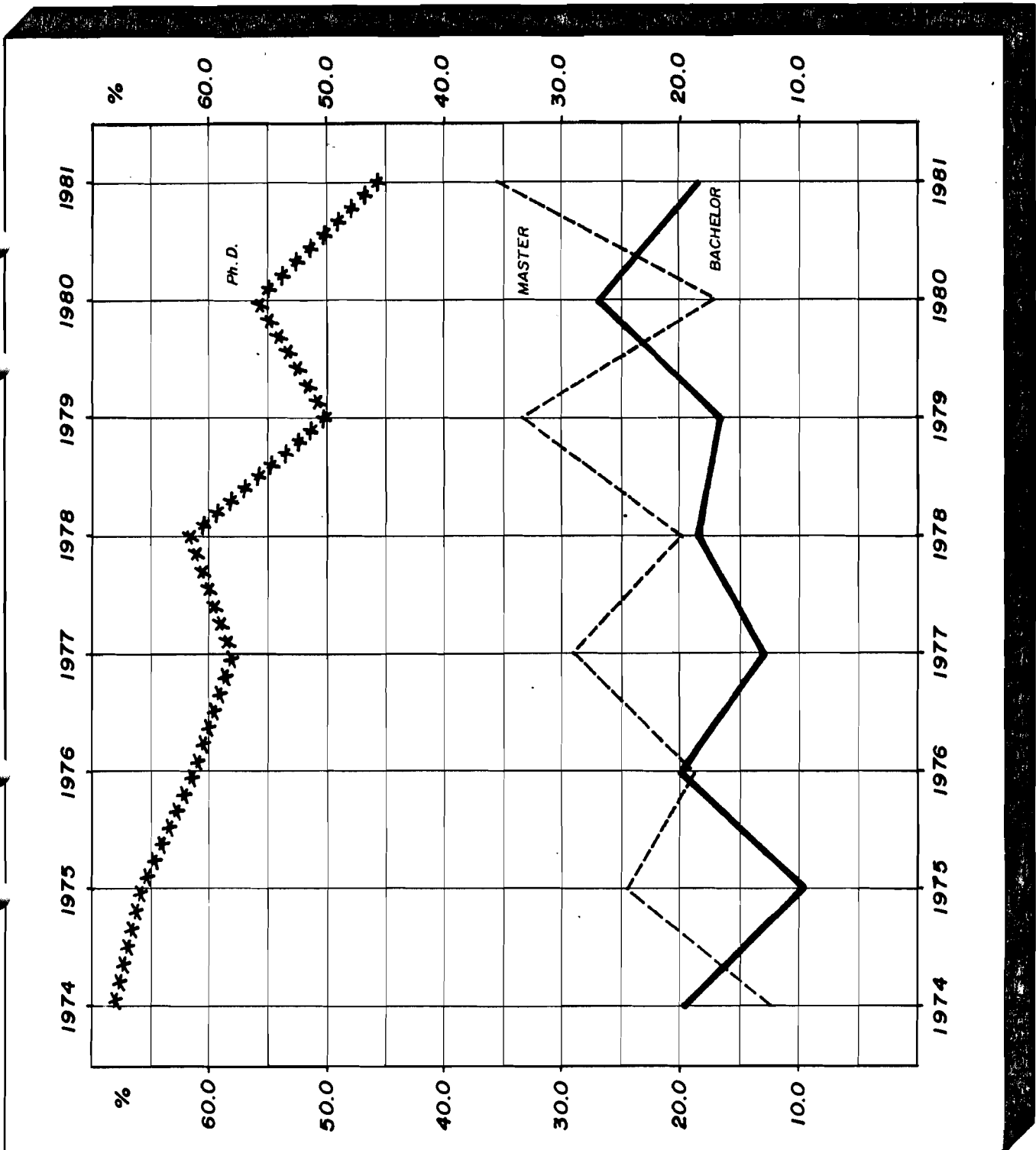
However, it is doubtful that the IFS could or should make a special effort to support a larger proportion of female grantees, primarily because the lack of participation of women in scientific activities is a structural condition in most developing countries, and one that is rather difficult to solve through the intervention of an institution like the IFS.

Academic Degree of Grantees

The percentage distribution of grantees according to the degrees obtained before grant is shown in Figure N°18 and in Table N°20. In the eight years of operation of the IFS, the overwhelming majority of grantees have had their PhD or Master degrees before obtaining the grant. There have been no cases of grantees without at least a Bachelor's degree, and the number of grantees with only a Bachelor's degree has remained around 20% between 1974 and 1981.

An interesting trend to observe is the relative reduction over time in the number of PhDs awarded IFS grants, and the corresponding increase in the number of grantees with a Master's degree. This general trend may be the result of two factors: the progressive expansion of the IFS to countries without a well established scientific community and where a PhD is considered a

PERCENTAGE DISTRIBUTION OF GRADUATES ACCORDING TO ACADEMIC DEGREE OBTAINED BEFORE GRANT (1974 - 1981)



SOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

T A B L E N ° 20

ACADEMIC DEGREE OF GRANTEES BY YEAR

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>TOTAL</u>
None	--	--	--	--	--	--	--	--	---
BSc	19.5	9.4	20.0	12.9	18.2	16.7	26.9	18.4	18.4
MSc	12.2	24.5	18.7	29.0	20.0	33.3	17.2	35.5	24.3
PhD	68.3	66.1	61.3	58.1	61.8	50.0	55.9	46.1	57.3
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

pre-requisite for an academic career; and the realization that in many cases young scientists in developing countries need not to wait for the PhD before embarking in an independent research career.

The distribution of grantees according to their academic degrees by region shows that the largest percentage of grantees with only a Bachelor's degree is found in Latin America, and the smallest in West and East Asia. On the other hand, West and South Asia accounts for the largest number of grantees with a PhD, and Latin America for the smallest number in this category. Latin America also has the largest proportion of grantees with a Master's degree, which exceeds its proportion of PhD grantees, while in all the other regions the number of PhD grantees exceeds significantly the number of grantees with a Master's degree or a Bachelor's degree. This would appear to reinforce the appreciation of an older and more established scientific community in the fields supported by the IFS in Asian countries when compared with Latin America.

The distribution of grantees according to research subjects, highest academic degree at the time of the grant, and whether the studies were done in developed or industrialized countries is shown in Table N°22, which contains information for 549 grantees. According to this table, out of the 528 grantees for whom the location degree is known, 257 (46.8% of the total) obtain their degrees in industrialized countries, while 271 (49.4% of the total) obtain their degrees in developing countries.

T A B L E N ° 21

ACADEMIC DEGREE OF GRANTEES BY REGION

(Percentages)

<u>%</u>	<u>None</u>	<u>BSc</u>	<u>MSc</u>	<u>PhD</u>
West Africa	0.0	22.1	16.3	61.6
East Africa	0.0	20.9	29.1	50.0
West & South Asia	0.0	3.3	10.0	86.7
South East Asia	0.0	18.3	27.2	54.5
Latin America	0.0	28.2	39.7	32.1
T O T A L	0.0	18.4	24.3	57.3

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981,
 Statistical information, Provisional Report 2nd June 1982, processed
 by the Evaluation Panel

T A B L E N ° 22

DISTRIBUTION OF GRANTEES ACCORDING TO RESEARCH SUBJECTS,
ACADEMIC DEGREES AND STUDIES DONE IN DEVELOPING OR INDUSTRIALIZED COUNTRIES

<u>Scientific Area</u>	<u>Degrees obtained in: (1)</u>			<u>PhD obtained in:</u>			<u>Total Number of all Grantees (3)</u>
	LDC	IC	Sub Total	LDC	IC	Sub Total	
Acquaculture	56	42	98	18	30	48	100
Animal Production	51	39	90	11	27	38	96
Vegetables	60	60	120	28	45	73	130
Mycorrhiza	22	20	42	7	12	19	43
Fermentation	25	23	48	10	18	28	49
Natural Products	45	65	110	31	57	88	111
Rural Technology	12	8	20	4	4	8	20
T O T A L	271	257	528 (2)	109	193	302	549
% of all grantees	49.4	46.8	96.2	19.9	35.1	55.0	100.0

NOTES: (1) No case of "no degree"
 (2) Data missing for 21 grantees
 (3) Information from records available for 549 grantees

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical Information, Provisional Report 2nd June 1982, processed by the Evaluation Panel.

For those 303 grantees on whom information is available and who held a PhD, 193 (35.2% of the total) obtained their PhD in industrialized nations, while only 109 (19.9% of the total) obtained their PhDs in developing countries.

Considering the scientific areas, natural products has the largest proportion of PhDs among its grantees, while the smallest proportion is found in the area of rural technology. In the area of animal production, a larger proportion of grantees obtained their PhDs in industrialized countries (nearly 3 times as many) whereas in most other areas the proportion is just below two to one in favor of PhDs obtained in developed countries. The exception is rural technology where out of the 8 PhDs that have been awarded grants, 4 obtained their degrees in industrialized Asia and the other 4 in developing countries. These variations are in part a reflection of the differences among fields with regard to the academic qualifications of researchers. For example, in the agricultural field there is less incentive to obtain PhDs in comparison to chemistry or biology, for a doctorate is not considered a requirement to pursue a research career. An extreme case would be that of rural technology, for there are no PhDs awarded specifically in this field.

The data on degrees indicates that the great majority of IFS grantees has received academic training that qualifies them for independent research, and that there are regional differences that may be the result of the specific characteristics of the scientific community in the areas and countries supported by the IFS in a given region. There is also evidence that a large proportion (50%) of grantees obtain their degrees in developing countries, and that this extends even to the PhD level: 20% of the grantees have received their doctorates in developing countries, as compared with 35% in the industrialized countries.

Experience of Grantees before the Award

The experience of grantees before receiving the IFS grant is shown in Tables N°23 and 24 and in Figure N°19. The first cut, classifying grantees according to whether they have 4 or less years of experience before the award or 5 or more, shows some variation over time, but in general it would appear that the IFS has supported more experienced young scientists. Figure N°19 shows the evolution over time of grantees according to three categories of years of experience. In all years, with the exception of 1980, the number of scientists with less than 3 years of research experience, exceeds the number of scientists with more than 8 years of research. The intermediate category comprising scientists with 4 to 7 years of research experience, occupies a middle position between the two other categories in most years.

The definition of "more experienced" or "less experienced" scientist will vary according to region, country within region, and also according to the scientific area; for this reason it is very difficult to determine a clear cut-off point to classify grantees in one or another category. If "less experienced" researchers is defined as those with 3 or less years of research experience prior to the grant, the IFS is supporting a relatively large proportion of less experienced scientists, and if "more experienced" is defined as those with 8 or more years of experience before the grant, the IFS is supporting a relatively small proportion of more experienced scientists. This would leave scientists in 4 to 7 years of experience range in an intermediate position. On the other hand, if only two categories are used, as in Table N°23, the "more experienced" scientists with 5 or more years of experience would predominate.

T A B L E N ° 23

YEARS OF EXPERIENCE BEFORE RECEIVING THE GRANT

(Percentage of Grantees each Year)

<div> <div>YEAR</div> <div>EXPERIENCE</div> </div>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
0 - 4 years	30.0	28.6	56.2	47.1	35.7	68.8	25.0	50.0
5 + years	70.0	71.4	43.8	52.9	64.3	31.2	75.0	50.0

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

SOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

PERCENTAGE DISTRIBUTION OF GRANTEES ACCORDING TO THE NUMBER
OF YEARS OF PREVIOUS EXPERIENCE BEFORE GRANT
(1974 - 1981)

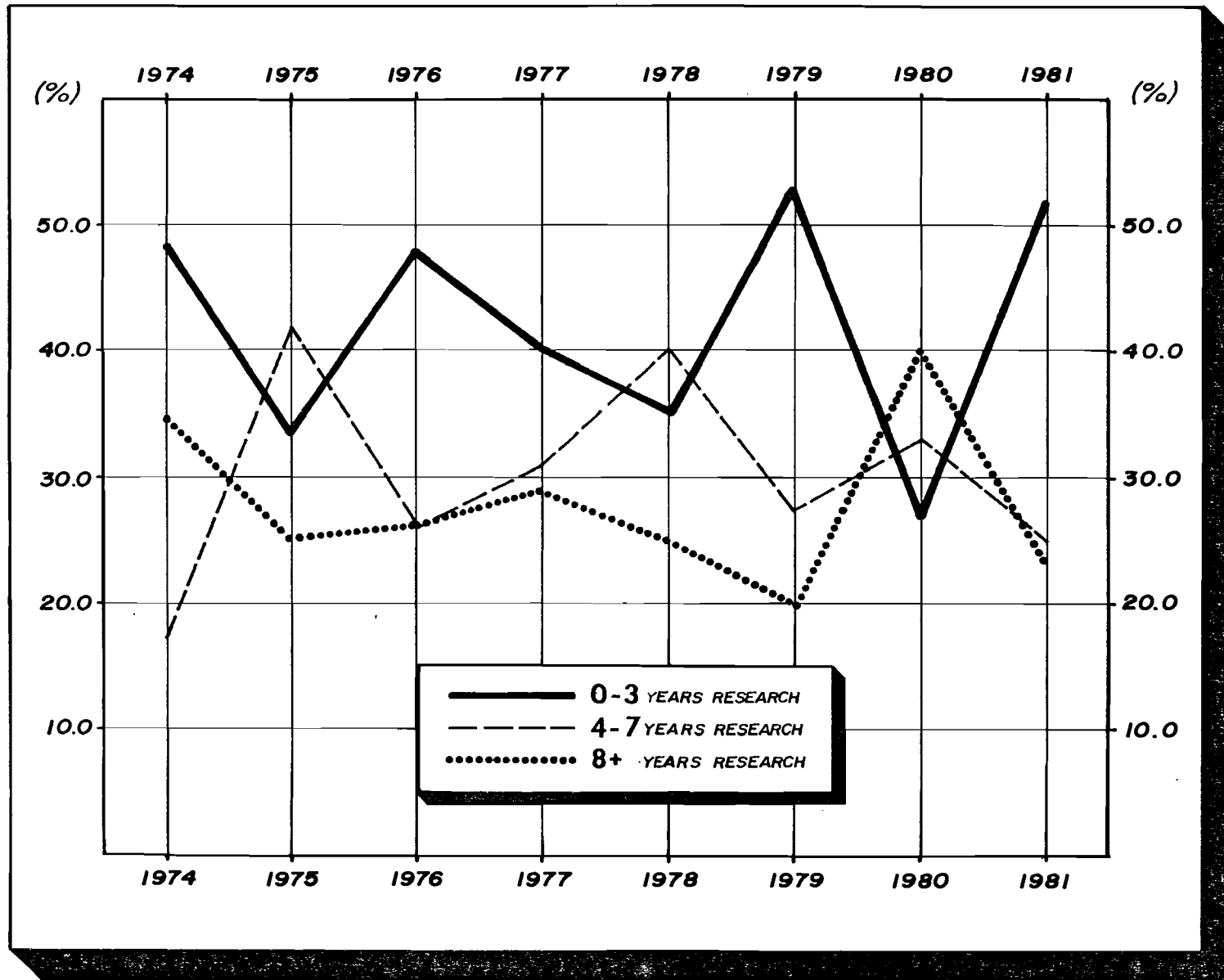


FIGURE N° 19

T A B L E N ° 24

YEARS OF EXPERIENCE BEFORE GRANT ACCORDING TO REGION

(Percentages)

	<u>0-1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6-7</u>	<u>8-9</u>	<u>9 +</u>	<u>TOTAL</u>
West Africa	17.4	15.9	10.2	8.7	4.3	17.4	10.2	15.9	100.0
East Africa	13.2	28.3	13.2	3.8	3.8	17.0	5.6	15.1	100.0
West & South Asia	9.3	6.7	4.0	8.0	5.3	17.3	14.7	34.7	100.0
South East Asia	24.4	14.7	8.4	11.2	4.2	14.7	7.7	14.7	100.0
Latin America	17.3	19.2	5.8	11.5	7.7	15.4	15.4	7.7	100.0
T O T A L	17.9	15.8	8.2	9.2	4.8	16.0	10.2	17.9	100.0

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

Table N°24 shows the distribution of years of experience of grantees according to region, with a more detailed breakdown of the number of years of experience. South East Asia has the largest proportion of grantees with one or less years of experience, while West and South Asia has the largest proportion of more experienced grantees, with 34.7% of them having more than 9 years of experience. In Latin America most of the grantees have less than two years of experience, and the proportion of grantees in this category is even larger for East Africa and South East Asia.

The differences found among regions in the experience of grantees raise some interesting questions when compared to the differences found in the academic degrees of grantees. In effect, it could be expected that those regions where grantees are less experienced would have a largest proportion of PhD grantees, which would mean that they spend a long time doing graduate work before proceeding immediately after their degrees into research. On the other hand, in those regions where Bachelor's and Master degrees predominate, a greater proportion of more experienced grantees could be expected, meaning that grantees start their research careers as assistants and after a few years of experience begin to work independently and apply for a grant.

However, the data in Table N°25 shows that the proportion of grantees with four or less years of experience and those with five or more remains approximately the same, regardless whether the grantee has a PhD, a Master's, or a Bachelor's degree. This would seem to contradict the hypo-

T A B L E N ° 25

YEARS OF EXPERIENCE BEFORE GRANT

vs. ACADEMIC DEGREE OF GRANTEE

ACADEMIC DEGREE	YEARS OF EXPERIENCE	
	<u>0 - 4</u>	<u>5 +</u>
BSc	48.7	51.3
MSc	60.4	39.6
PhD	48.2	51.7
T O T A L	<u>51.5</u>	<u>48.5</u>

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981,
Statistical information, Provisional Report 2nd June 1982,
processed by the Evaluation Panel

thesis put forward in the preceding paragraph, even though a more detailed breakdown of experience categories would be required to drive at a definitive conclusion. Furthermore, from Table N°24, it would appear that researchers in West and in East Africa obtain their grants relatively soon after they complete their PhD, and the same could be said of South East Asia. On the contrary, in West and South Asia 34.7% of the grantees have 9 or more years of experience, and this region also has the highest proportion of PhDs; 86.7% of the grantees, which means that the IFS is reaching relatively more experienced and highly qualified scientists than in other regions.

Table N°26 indicates the percentage distribution of grantees according to the number of years of experience before the grant by scientific area. It can be appreciated that fermentation and natural products are the two areas in which grantees have relatively longer experience, while rural technology, aquaculture, and animal production have a relatively higher proportion of less experienced grantees. The situation is somewhere in between for the case of vegetables and mycorrhiza. This can be seen very clearly from the rankings shown in Table N°26 where the interval of grantees with one or less years of experience comes first for all scientific areas excepting fermentation and natural products in which the interval of 9 or more years of experience comes first.

T A B L E N ° 26

PERCENTAGE DISTRIBUTION OF GRANTEES ACCORDING TO
YEARS OF EXPERIENCE BEFORE THE GRANT, BY SCIENTIFIC AREA

SCIENTIFIC AREA YEARS OF EXPERIENCE	<u>ACQUA- CULTURE</u>	<u>ANIMAL PRODUCTION</u>	<u>VEGETABLES</u>	<u>MYCORRHIZA</u>	<u>FERMEN- TATION</u>	<u>NATURAL PRODUCTS</u>	<u>RURAL TECHNOLOGY</u>	<u>TOTAL</u>
0 - 1	24.1	23.0	18.5	31.0	15.0	3.6	20.0	17.9
2	16.4	16.9	17.3	10.3	17.5	14.5	13.3	15.8
3	5.1	7.7	11.1	13.8	5.0	6.0	20.0	8.2
4	10.1	10.8	3.7	10.3	12.5	9.6	13.3	9.2
5	5.1	6.2	4.9	10.3	2.5	3.6	0.0	4.7
6 - 7	12.7	13.8	17.3	7.0	20.0	20.5	20.0	16.1
8 - 9	10.1	6.2	14.8	10.3	5.0	12.0	6.7	10.2
> 9	16.4	15.4	12.4	7.0	22.5	30.1	6.7	17.9
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1
99
1

R A N K I N G S

0 - 1	1	1	1	1	4	7	1	1
2	2	2	2	3	3	3	4	4
3	7	6	6	2	7	6	1	7
4	5	5	8	3	5	5	4	6
5	7	7	7	3	8	7	8	8
6 - 7	4	4	2	7	2	2	1	3
8 - 9	5	7	4	3	6	4	6	5
> 9	2	3	5	7	1	1	6	1

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

Some General Remarks Concerning the Grantees

In general terms, it can be said that the IFS has supported young and relatively less experienced scientists in the developing countries helping them to establish a scientific reputation of their own. However, there are significant differences in the age structures according to regions, to scientific areas and experience, which would warrant more detailed analysis and examination.

The number of potential grantees that could benefit from the IFS has been increasing continuously, and according to information and opinions obtained during the evaluation from Scientific Advisors, Project Secretaries, officers from National Member Organizations, grantees, and officers of host institutions, there is no limit to the number of potential applicants and grantees in the present seven scientific areas. However, reaching this potential pool of applicants in a way that they would effectively apply for an IFS grant would require a more systematic and intensive effort by the Foundation.

The unanimous opinion obtained from interviews with grantees, officers of host institutions and National Member Organizations, and Scientific Advisors, is that the IFS grants have had a significant impact on the career development of most grantees. Being awarded and managing their own individual grant has made a significant difference in the career pattern of the large majority of IFS grantees. However, it was also pointed out by a large proportion of grantees that they would have welcomed and profited from more continuous advice and closer monitoring by the Secretariat and Scientific Advisors.

2.e. NATIONAL MEMBER ORGANIZATIONS AND HOST INSTITUTIONS

The National Member Organizations of the Foundation and the host institutions of the IFS grantees are the two types of external organizations involved in the operation of the IFS. On the basis of a questionnaire distributed by the Evaluation Panel, answered only by a few National Member Organizations, and of interviews by members of the Evaluation Panel, some general remarks can be made on the roles of these two types of institutions.

National Member Organizations

Table N°27 lists the National Member Organizations as of 1980. In that year there were a total of 51 National Member Organizations, of which 37 were from developing countries and 13 from developed countries. This membership included 18 academies of science and technology, 25 research councils, 5 universities, and 3 institutions that cannot be classified in any of these categories. It is interesting to notice that 24 out of the 25 research councils, which are usually official governmental bodies, are from developing countries, while the largest proportion of academies, which are usually non-governmental scientific institutions, are found in the developed countries.

National Member Organizations are the constituency of the IFS. They gather once every three years at the General Assembly to give general orientations and to elect the Board of Trustees. In addition to this general function, National Member Organizations in developing countries have the function of disseminating information about the IFS to put potential applicants

T A B L E N ° 27

TYPES OF NATIONAL MEMBER ORGANIZATIONS

(as of 1980)

	<u>TOTAL</u>	<u>ACADEMIES</u>	<u>RESEARCH COUNCILS</u>	<u>UNIVERSITIES</u>	<u>OTHERS</u>
From Developing Countries	37	7	24	5	1
From Developed Countries	14	11	1	0	2

in contact with the IFS Secretariat. In a few countries, the law requires that all international fellowships and awards be screened and approved by the National Member Organization, in which case all applications are channelled through these institutions to the IFS. It is more frequent, however, that the National Member Organizations play mainly a promotional role and are not required by law to give their approval before an application can be forwarded to the IFS Secretariat.

It is desirable that National Member Organizations be kept fully informed of the IFS activities in their countries. It is also apparent that National Member Organizations could provide information on local priorities, research facilities, and possibilities of completing the research in time, and this could be taken as an input into the evaluation of grant applications. In addition, National Member Organizations could participate actively in the organization of national or regional workshops of IFS grantees, and could also help in the publication of research results.

The National Member Organizations could also play an effective role in the nomination of Scientific Advisors. In this regard, the Board could request nominations for Scientific Advisors from the National Member Organizations, choosing among the nominees to conform the roster of Scientific Advisors. This may give a more active and visible role to the National Member Organizations, and help in achieving a better geographical balance in the list of Scientific Advisors.

The Host Institutions

The host institutions to which the IFS grantees belong have a larger role than it is usually recognized in the Foundation's activities. The fact that they must endorse the application before it is formally examined by the IFS Secretariat, that they are committed to support the researcher's salary during the tenure of the award, and that they cover general operating expenditures, makes the IFS awards cooperative endeavours between the host institutions and the IFS. However, from field interviews, it appears that communication between the IFS Secretariat and the host institutions have not been as continuous and fluent as they could have been. This sentiment was expressed by several representatives from host institutions.

In most host institutions contacted during the evaluation, the IFS grants represent a relatively small proportion of the total research budget of the institute. However, some representatives of host institutions mentioned that IFS grants help to release funds for other programmes and, more importantly, provide a source of foreign exchange, all this in addition to their main role of funding young researchers. Management procedures for the grant vary significantly from one institution to another, and also from country to country, but most institutions allow the grantees to make their own decisions regarding the use of the funds, even though they are usually required to channel IFS resources through the institution's accounting and banking systems.

A few staff members from host institutions expressed their concern regarding the possibility of IFS interfering with the research priorities established by the host institutions. It was felt that this may arise because the IFS

provides resources directly to the grantees who, in most cases, are free to contact the IFS and apply for a grant. However, the fact that prior endorsement is required before an application can be processed by the Secretariat has helped considerably in eliminating the tensions that could have emerged. Many representatives of host institutions expressed their interest in and willingness to participate actively in the monitoring of IFS grants, and also in giving their opinion on grant renewal applications. In addition, host institutions could organize seminars to discuss the results of research supported by the IFS with other grantees at the national or regional levels.

In general, the main conclusion derived from field interviews with authorities from host institutions is that there is a need for improved communications between the host institutions and the IFS Secretariat. Host institutions should become more active and involved members of the IFS community.

2.f. SCIENTIFIC AREAS

During the conduct of the evaluation it was not possible to make a detailed analysis of the scientific areas supported by the IFS, or to assess the scientific merit of the research carried out by the grantees. However, the general sentiment of most persons interviewed during the conduct of the evaluation was that the IFS should keep working primarily in the same areas it has covered until now, and that any changes introduced should be gradual and cautious.

The present areas in which the IFS is supporting are:

Acquaculture, which comprises: research on fish and shell-fish to develop local fish-farming. Fry production, including artificial spawning. Feeding, genetic improvement, cultivation techniques. Useful aquatic plants.

Animal Production, which comprises: development of new feed resources and methods for dry season feeding. Introduction of improved animal production systems, research on neglected animal species and collection of basic information on performance of local breeds. Prolonging storage life of animal products.

Vegetables, oil seeds and fruits, encompassing: crops of value particularly in subsistence agriculture. Research on plant physiology and pathology. Genetic improvement for higher yield and disease resistance. Cultivation techniques, disease control and drought resistance. Plant-soil-water relationships, soil microbiology. Methods for improved storage and simple processing.

Mycorrhiza and afforestation, which include: symbioses between fungi and roots of trees or agricultural plants. Research in physiology, ecology, and symbiotic efficiency of different fungi. Inoculation methods. Afforestation methods for tropical countries.

Fermentation and applied microbiology, encompassing: traditional fermentation processes, research on mycotoxins. New methods for food preparation. Storage of food. Biogas.

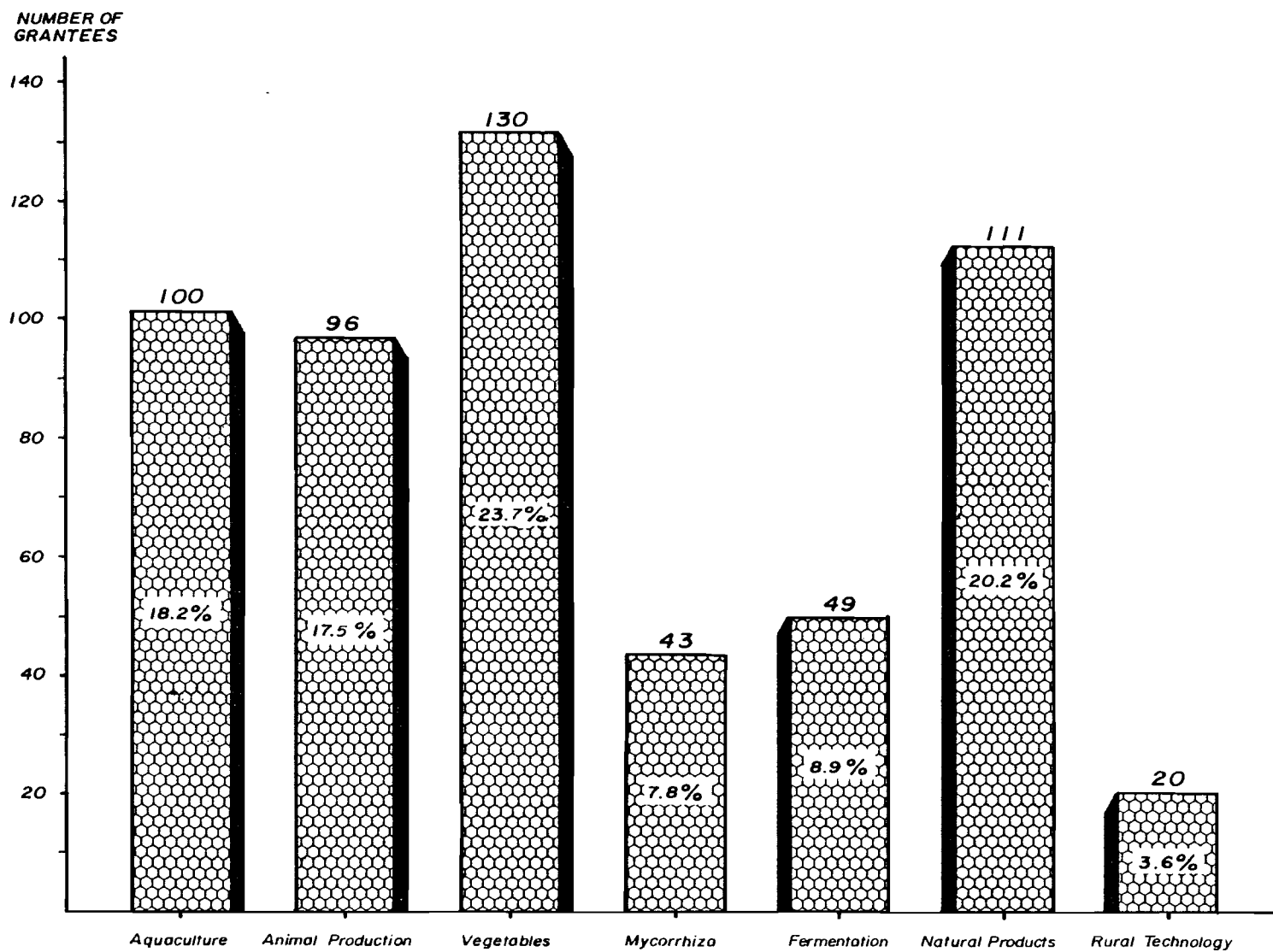
Natural Products, which comprises: utilization, isolation and investigation of useful compounds from plants. Search for new sources of plant-derived chemicals. Structure elucidation. Phytochemical and pharmacological investigations, including ethnobotanic studies. Cultivation; and

Rural Technology, covering: low-cost technology for rural and agricultural construction, particularly with locally-available materials. Examples are fish ponds, human dwellings, animal housing, drying and storage facilities, small-scale energy plants for villages or farms, water systems.

Figure N°20 shows the distribution of research grants according to scientific areas. It can be observed that vegetables and natural products account for 23.7% and 20.2% of the total grants, while aquaculture comes third with 18.2%. The relatively new area of rural technology has received only 20 grants, which amounts to 3.6% of the total grants awarded by the IFS.

SOURCE: N. Herlofson et al, op cit, processed by the Evaluation Panel

DISTRIBUTION ON RESEARCH SUBJECTS

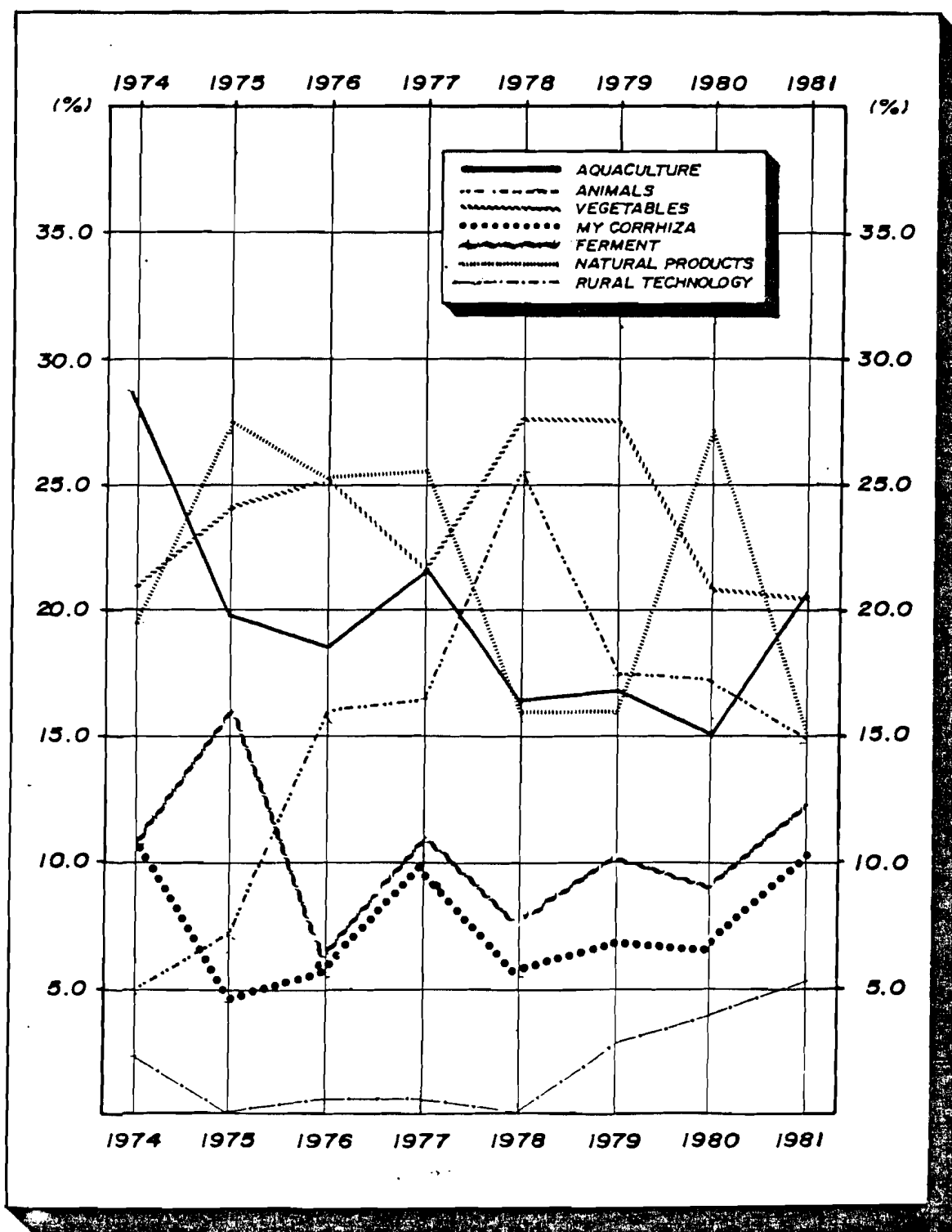


The evolution over time of the distribution of new grants or renewals according to scientific field is shown in Figure No. 21. In most areas, there are significant variations over time, with a more pronounced shift taking place in the area of vegetables, natural products, and aquaculture, which are the three fields with the larger number of grants. No overall tendency can be discerned from the evolution in time of the grants awarded each of the seven fields by the IFS.

While the general opinion of the persons interviewed is that the IFS should remain basically in the same fields, the Evaluation Panel received a suggestion in the sense of narrowing and concentrating the present seven programme areas, changing emphasis within each of them in a dynamic way. Thus in an area like vegetables or animal production, emphasis could be placed on certain products or animals in a given year, to be changed in subsequent years. Furthermore, there were suggestions to enlarge the present coverage of scientific areas to include cash crops, medicinal plants, research on the problems of drought and arid zones, and also new and renewal energy sources. More radical suggestions considered a possible move into the tropical diseases area, but nobody suggested moving away from the present group of scientific areas.

A point stressed by most persons interviewed was the need to expand the present range of areas to cover the socio-economic problems associated with the introduction of new technologies. This would imply adding a social sciences component to the research projects supported by the IFS, or to award grants to study socio-economic implications, complementing the work done on the technical aspects by other grantees.

PERCENTAGE DISTRIBUTION OF GRANTS AWARDED
EACH YEAR BY FIELD
(1975 - 1981)

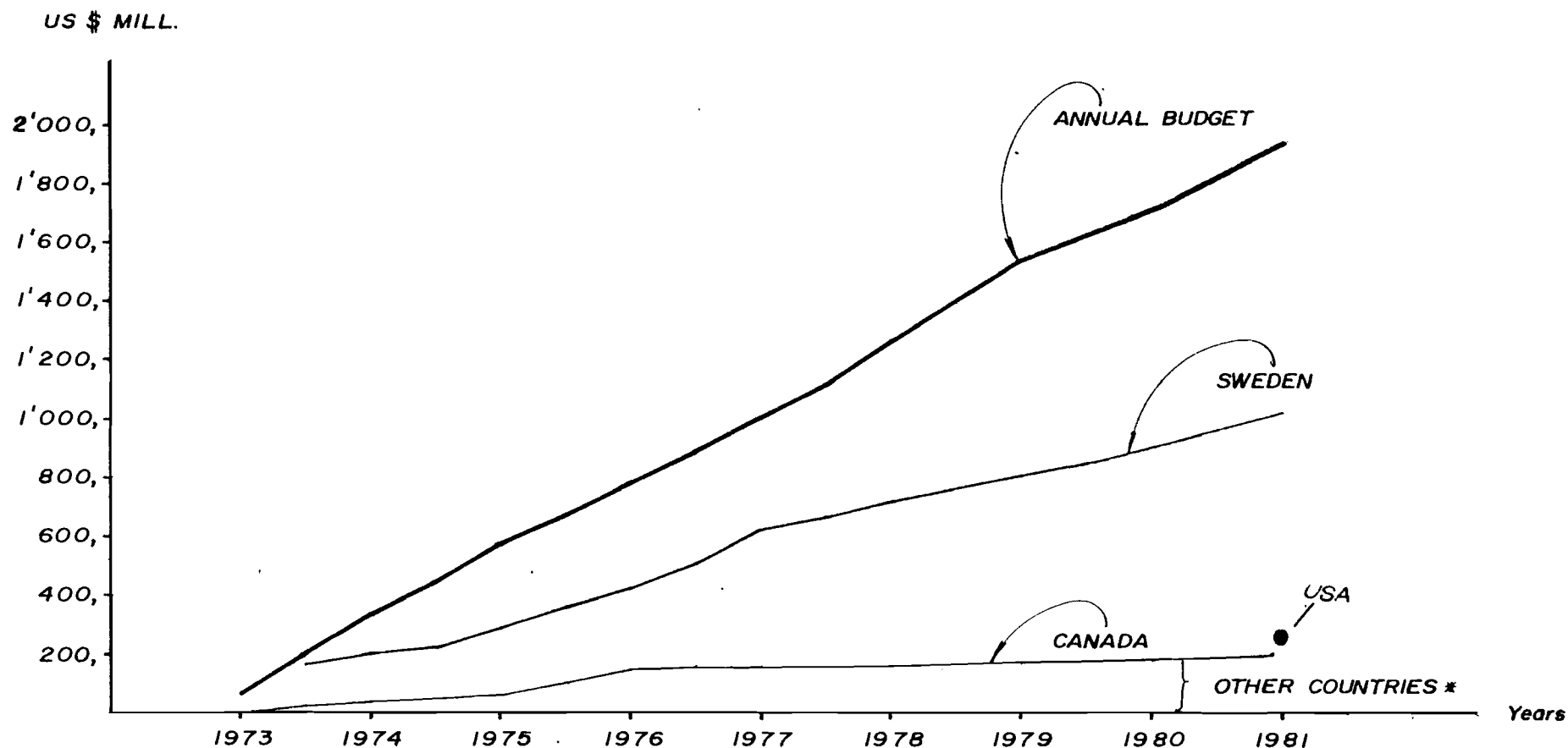


2.g. FUNDING PATTERNS

Figure N°22 and Table N°28 show the evolution of contributions to the IFS budget and of the various sources of funds for the IFS. Between 1974, when the first grants were awarded, and 1981 the budget has grown up approximately 7.7 times, from 1'380,000 Swedish Krona to 10'655,000 Swedish Krona. The Swedish contribution, channelled through the Swedish Agency for Research Cooperation with Developing Countries (SAREC), represents just below 50% of the total IFS resources in 1981. The Canadian International Development Research Centre has kept its level of contributions to approximately 10% of the total budget of the IFS, while the rest has been financed by German, French, Dutch, Belgian, Norwegian, and to a lesser extent Swiss organizations. The U.S.A., through the National Academy of Sciences, has contributed significantly in 1981, and Australia has also made the contribution for the first time in that year. Other sources of support during the existence of the IFS have included Japan, Nigeria, the UNESCO, the World Bank, and also the Salen Foundation from Sweden, which gave a small grant in 1973 to begin the operations of the IFS.

The increasing difficulties for obtaining multilateral funding for international organizations could begin to affect the International Foundation for Science some time in the near future. Even though the IFS budget is relatively small in comparison with that of other funding agencies, there is a perceived shift in donor agencies towards privileging bilateral channels, rather than multilateral channels such as the IFS. To the extent that development cooperation and assistance resources are being reduced in the donor countries, and a more serious competition for funds between more visible bilateral programmes and multilateral activities begins to emerge, the IFS could encounter serious difficulties.

CONTRIBUTIONS TO IFS BUDGET



* Belgium, France, Germany, Netherlands, Norway, Switzerland. In 1981 Australia, Japan and Nigeria also made contributions.

T A B L E N ° 28

EVOLUTION OF SOURCES OF FUNDS FOR THE
INTERNATIONAL FOUNDATION FOR SCIENCE *

	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Sweden	127	1052	1361	1778	2045	2952	3819	4002	4747
Canada	30	147	229	654	650	642	685	755	991
Germany, Fed. Rep.	--	--	57	297	335	437	465	464	539
France	--	--	60	223	230	240	375	357	520**
Netherlands	--	--	109	105	120	95	107	216	234
Belgium	--	--	--	228	283	439	515	558	290
Norway	--	--	--	--	200	226	214	210	211
Switzerland	--	--	--	--	44	41	83	86	93
Nigeria	--	--	--	--	102	--	--	--	211
Japan	--	--	--	33	--	--	--	--	--
U.S.A.	39	--	--	--	--	--	--	--	1126
Australia	--	--	--	--	--	--	--	--	314
UNESCO	--	--	--	--	--	20***	209	109	201
World Bank	--	115	--	--	--	--	--	--	--
Salen Foundation	84	--	--	--	--	150***	--	100***	--
Membership Fees	3	9	15	15	20	20	18	24	28
Other income, interest	10	57	66	92	277	211	270	450	879
Grants withdrawn	--	--	--	--	--	--	--	--	271
Unexpended Funds from 1974	--	--	571	--	--	--	--	--	--
T O T A L	<u>293</u>	<u>1380</u>	<u>2478</u>	<u>3415</u>	<u>4366</u>	<u>5473</u>	<u>6757</u>	<u>7331</u>	<u>10655</u>

* In thousands of Swedish Krona

** Plus 1 salary, starting 197

*** For special project purposes

SOURCE: IFS Annual Reports, 1974-1981, compiled by the Evaluation Team

For this reason, it is most important to consolidate and diversify the sources of funding. This would imply building a constituency for the IFS in development assistance circles in the donor countries, and also ensuring that National Member Organizations in the developed countries become pressure groups that support the IFS actively.

The fact that most donor countries provide funds to the IFS through official development assistance agencies, makes it necessary for the IFS to be sensitive to the Agencies' need for accountability in their own countries. This would require a more determined effort to establish communication with the donor agencies supporting the IFS, providing them with up to date information on the Foundation's operations, procedures and activities.

The increasing need for the IFS to pay attention to financial matters, and the need to build a constituency in the donor countries and provide for accountability in a more visible way, requires that the IFS Secretariat take a more active supporting role in the process of raising funds and establishing contact with actual and potential donors. This could be done, in particular, by assisting the President of IFS and the Sponsors' Committee in their fund raising activities.

Finally, with possible difficulties in obtaining funds for the IFS in the future, it is important to introduce budgeting procedures that may anticipate funding requirements several years ahead. In this regard, as a byproduct of the statistical analysis carried out by the team headed by the former Director of the IFS, Dr. Nikolai Herlofson, certain regularities in the granting process were observed, particularly with regard to grant renewals. Based on some

hypothesis on the number of new grants awarded by year, the regularities observed by Herlofson and his collaborators, and the average size of grants, it would be possible to plan the IFS budget at least 3 to 5 years in advance.*

* See: IFS Review 1974-1981, Statistical Information, Supplementary Report 22nd June 1982, prepared by N. Herlofson, with the assistance of R. Romhed.

2.h. THE IFS SECRETARIAT

To a very large extent the effective operation of a small grants programme is dependent on the quality of the Secretariat staff, and during the conduct of the evaluation this emerged as one of the main factors contributing to the success of the IFS. Furthermore, the administration of a small grants programme is an expensive and cumbersome operation. The relatively large number of applications to be processed and evaluated, and the follow-up and monitoring activities required in addition to the tasks involved in the identification of potential grantees, impose a heavy load on the Secretariat staff, and particularly on the Project Secretaries.

With a continuously increasing number of grants, the size of the Secretariat has remained practically the same during the 8 years of operation of the IFS, and at present the amount of work involved in the granting process is beginning to exceed the technical and administrative capacity of the two Project Secretaries.

Two issues will be examined briefly regarding the activities of the IFS Secretariat: funding patterns, activities of staff members and services to the grantees.

Financial Aspects of the IFS Secretariat Operations

Tables N° 29 and N°30 show the income and expenses of the IFS during 1981. Out of approximately 10.6 million Swedish Krona in the 1981 statement of expenses, approximately 7 million were spent in grant awards, half for new grants and half for grant renewals.

T A B L E N ° 29
I F S I N C O M E 1 9 8 1
(in thousands of Swedish Krona)

<u>INCOME</u>	<u>UNITS OF</u> <u>1 000 Skr</u>
Sweden	4 747
U.S.A.	1 126
Canada	991
Germany, Fed. Rep.	539
France	520 (+ 1 salary)
Australia	314
Belgium	290
Netherlands	234
Norway	211
Nigeria	211
Switzerland	93
UNESCO	201
Membership fees	28
Other income, interest	879
Grants Withdrawn [*]	271
	<hr/>
T O T A L	10 655
	=====

Nominal exchange rate USD 1 = Skr 5.6

* During 1981 six grantees informed the Secretariat that they were unable to start the research projects for which an IFS grant had been approved.

T A B L E N ° 30
I F S E X P E N S E S 1 9 8 1

(in thousands of Swedish Krona)

<u>Research Grants</u>	New	Renewals	
Acquaculture	743	749	
Animal Production	472	472	
Vegetables	647	741	
Mycorrhiza	413	401	
Fermentation	224	566	
Natural Products	645	606	
Rural Technology	246	91	
Special Grants	65		
	<hr/> 3 460	<hr/> 3 616	7 076
<u>Project Costs</u>			
Travel grants and workshops		548	
Experts' travels and meetings		92	
Staff travels		60	
Programme development and other costs		124	
Regional activities		115	939
		<hr/>	
<u>General Assembly</u>		316	316
		<hr/>	
<u>Administration</u>			
Salaries and social costs		1 599	
Office expenses		609	
Travels and meetings		75	
Other expenses		41	2 324
		<hr/>	
	T O T A L		10 655
			=====

Nominal exchange rate USD 1 = Skr 5.6

The cost associated with project development and services reached approximately 900,000 Swedish Krona; the cost of the General Assembly meeting, held in Chiang Mai in Thailand in 1981, reached approximately 300,000 Swedish Krona; while the rest of the expenditures in 1981 referred to administrative costs, including salaries and office expenses.

However, an accounting statement of this type does not provide management information regarding the operations of the Foundation. For this purpose, Table No. 31 indicates the allocation of resources to different activities in the IFS budget for 1982. Supporting activities, covering administration, identification of grantees, preparation of grant agreements and similar tasks, were programmed to take 14% of the total budget of the IFS, while in practice they took 16.9%. Resources given directly to the grantees were programmed to represent 62.4% of the budget during 1982, and they stayed close to this figure with 62.9% of resources being spent for this purpose. Services to grantees, including travel arrangements, provision of literature, expenses related to the purchase of equipment and material, and similar items, were expected to take 17.3% of the budget, and they took 16.9%. Finally, the category of complementary activities was programmed to take 5.3% of the resources, and took 4.9% in actual practice. The differences between programmed and executed budgets are rather small and appear to indicate that the Secretariat is paying close attention to budgeting procedures.

Similar remarks could be made with regards to the allocation of resources according to the type of cost item in the 1982 budget. Table No. 32 indicates that 18.4% of the Secretariat expenses were programmed for payroll, and that in practice this cost item amounted to 17.0% of the actual expenses. The provision of grants was supposed to

T A B L E N ° 31

ALLOCATION OF RESOURCES IN THE PRELIMINARY IFS BUDGET 1982

(Percentages according to Types of Activity)

	Programmed for the year %	Executed Jan 1st/Aug 31st %
SUPPORTING ACTIVITIES	14.0	16.9
- Administration		
- Identification of Grantees		
- Preparation of Grant Agreements		
RESEARCH GRANTS	62.4	62.9
- Funds provided to Grantees		
SERVICES TO GRANTEES	17.3	16.9
- Complementary Grants		
- Provision of Literature		
- Purchase of equipment and material		
- Visiting Advisors		
- Supplementary Travel Grants		
COMPLEMENTARY ACTIVITIES	5.3	3.3
- Publications		
- Representing IFS at Events		
- Special Activities		
T O T A L	100.0	100.0

- 120 -

SOURCE: IFS Secretariat estimates

account for 67% of the total 1982 budget, and it represented 66.7% of actual expenditures. Travel expenses, office operations, and professional services also showed a close correspondence between the programmed and executed budgets.

Activities of the Secretariat Staff Members

The Secretariat of the International Foundation for Science is a small unit consisting of 11 persons (see Annex 4). There are two Project Secretaries who, under the supervision of the Director, are responsible for the technical aspects of granting activities. In addition, there is one person in charge of providing purchasing services to the grantees, and other persons in charge of international and institutional relations of the IFS Secretariat.

A preliminary estimation of the average allocation of time by the IFS Secretariat members for 1982 is shown in Table No. 33. It can be seen that supporting activities, comprising both administrative and scientific services, account for 51.5% of the time of IFS Secretariat staff members. A smaller percentage is taken by the provision of services to grantees (purchasing equipment and material, contact with grantees, organization of workshops). A set of complementary activities of varied nature take the rest of the time of the staff.

The average time allocation during a year by the Project Secretaries is indicated in Table No. 34. This table shows that a large percentage of the time of Project Secretaries is devoted to administrative activities. For example, Project Secretaries spend up to a quarter of their time writing materials, servicing Committees,

T A B L E N ° 32

ALLOCATION OF RESOURCES IN THE PRELIMINARY IFS BUDGET 1982

(Percentages according to Types of Cost Item)

	Budgeted %	Executed %
Payroll	18.4	17.0
Professional Services	1.8	2.7
Travel	7.8	10.3
Office Operations	3.3	3.3
Grants	67.0	66.7
Contingency	<u>1.7</u>	<u>--</u>
T O T A L	100.0	100.0

SOURCE: IFS Secretariat estimates

T A B L E N ° 33

AVERAGE ALLOCATION OF TIME BY THE

IFS SECRETARIAT STAFF MEMBERS

(Percentage for 1982)

Support Activities:

Administrative Service	24.0%	
Scientific Service	27.5%	
	<hr/>	
T O T A L		51.5%

Service to Grantees:

Purchasing	8.5%	
Communications	22.5%	
Workshops	7.5%	
	<hr/>	
T O T A L		38.5%

Complementary Activities:

T O T A L		10.0%
-----------	--	-------

OVERALL TOTAL
=====

100.0%
=====

SOURCE: IFS Secretariat estimates

and interacting with Board members, Scientific Advisors, etc.; over 30% of their time is taken by monitoring and follow-up activities, including travel, attending workshops, answering technical enquiries, etc.; the identification of new grantees takes about 16% of the time of the Project Secretaries, and holidays and other activities take up the rest. It appears that a substantive amount of time is spent in administrative tasks by the Project Secretaries.

In order to examine whether there is a certain inter-relation between the scientific programme areas and the regional interests of the Project Secretaries, a table was constructed showing the differences between the total number of grants awarded in the two groups of scientific areas under the responsibility of each of the two Project Secretaries. The differences were calculated on a regional and yearly basis and shown in Table No. 35. One of the Project Secretaries is in charge of aquaculture, mycorrhiza and vegetables, while the other covers the rest of the scientific areas.

The differences in these two groups of grants appear to have become more acute in the last 3 years. One consistent pattern that emerges is that the number of grants in the fields of aquaculture, vegetables, and mycorrhiza, which are under the responsibility of a francophone Project Secretary, appear to dominate in french-speaking West Africa, with the exception of 1979. The reverse is the case in the East African region, where there is a predominance of grants in the fields of animal production, fermentation, natural products, and rural technology, which are under the supervision of a Scandinavian Project Secretary.

AVERAGE YEARLY TIME ALLOCATION TO DIFFERENT TASKS BY THE PROJECT SECRETARIES

<u>Activities</u>	<u>Remarks</u>	<u>Months</u>	<u>%</u>
Time spent writing materials, servicing committees, and interacting with Board members, scientific advisors, etc.	Material written includes: project reports; protocols of advisors meetings; summaries of agreements on each application; material for executive committee meetings; travel reports and accounts; description of IFS and grant programme; preparation of special reports; etc.	3	25.0
Monitoring and follow-up	Includes: travel for monitoring purposes; answering technical enquiries; writing letters to new grantees; attending workshops; reading progress reports; reading advisors letters and reports; etc.	3 1/2	29.2
Administrative contact with grantees	Includes writing letters to grantees on administrative issues.	1	8.3
Identifying new grantees and evaluating applications	Includes travel to identify grantees and attending advisors meetings.	2	16.7
Holidays		1 1/2	12.5
Other activities	Includes attending meetings and events organized by other agencies, and other miscellaneous tasks	1	8.3
T O T A L		12	100.0

SOURCE: Interviews with Project Secretaries

T A B L E N ° 35

DIFFERENCES IN GRANTS AWARDED TO SCIENTIFIC AREAS
GROUPED ACCORDING TO THE PROJECT SECRETARIES WHO ARE RESPONSIBLE FOR THEM

<u>Region</u>	Differences between total grants awarded in Acquaculture, Mycorrhiza, and Vegetables (A), and in Animal Production, Fermentation, Natural Products and Rural Technology (B). (A) - (B)							
	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
West Africa	4	0	0	6	1	3	6	9
East Africa	0	-6	-4	-1	-1	5	-8	-3
West & South Asia	0	1	1	1	6	-3	-7	-3
South East Asia	1	8	-1	6	-2	-2	-13	-3
Latin America	3	-1	0	-4	-6	3	3	6
T O T A L	8	2	-4	8	-2	6	-19	6
West Africa	»	~	~	»	~	>	»	»
East Africa	~	«	«	~	~	»	»	<
West & South Asia	~	~	~	~	>	»	»	<
South East Asia	~	»	~	»	>	<	»	<
Latin America	>	~	~	«	«	>	>	»
T O T A L	»	>	<	»	<	»	«	»

Key to the tables: A = N° of grants in Acquaculture/Vegetables/Mycorrhiza
 B = N° of grants in Animal Production/Fermentation/Natural Products/Rural Technology
 » = A greater than B in 4 or more grants
 « = B greater than A in 4 or more grants
 > = A greater than B in more than 1 but less than 4 grants
 < = B greater than A in more than 1 but less than 4 grants
 ~ = The difference between A and B less or equal to 1

SOURCE: N. Herlofson, M. Sedlacek and R. Romhed, IFS Review, 1974-1981, Statistical information, Provisional Report 2nd June 1982, processed by the Evaluation Panel

These differences may also reflect the relative emphasis placed by Project Secretaries in one or another region. For example, in South East Asia the number of grants in aquaculture, vegetables, and mycorrhiza dominates until 1978 when the situation is reversed, and grants in animal production, fermentation, natural products and rural technology take precedence starting in 1979. The contrary pattern is observed in Latin America, where after a period of relative dominance by the group of grants in animal production, fermentation, natural products and rural technology until 1978, the grants in aquaculture, vegetables, and mycorrhiza begin to predominate in the years after. Furthermore, it would appear that the Project Secretary in charge of animal production, fermentation, natural products and rural technology has placed more emphasis in the West and South Asian region after 1979.

In general, these shifts would reflect changes in regional emphasis by the Project Secretaries, and indicate that the regional and scientific distribution of grants awarded is dependent, to a very large extent, on the activities and interests of the Project Secretaries.

Services provided by the IFS Secretariat to the Grantees

Throughout the evaluation, the grantees expressed their interest and appreciation on the services provided by the IFS Secretariat, particularly with regards to the purchase of equipment and of expendable supplies. In addition, the Secretariat provides travel assistance and bibliographical information to the grantees.

There is one person in charge of the purchase of equipment at the IFS Secretariat. Table N°36 shows that approximately 200 invoices were paid during 1981, and data for 168 of them shows the distribution of orders of equipment according to the country of purchase and the corresponding value in U.S. dollars. In number of orders, the U.S.A. and England come first, while in dollar values Sweden, England and France take the lead, with Germany and the U.S.A. following closely. The 168 orders totalled US\$156,183.00 with an average of slightly less than 1,000 U.S. dollars per order. There were also a few orders of equipment from Belgium, the Philippines, Sri Lanka, India and Japan. In addition, many grantees buy their own equipment directly, without assistance from the Secretariat, although there are no centralized records for these purchases. Some grantees and staff members of host institutions suggested that these purchasing services should be made available to an enlarged population of scientists in developing countries, and not only to IFS grantees. However, this would add an excessive administrative burden to the IFS Secretariat and does not appear to be feasible at present.

T A B L E N ° 36

NUMBER AND VALUE OF ORDERS FOR SCIENTIFIC EQUIPMENT
PURCHASED BY THE IFS SECRETARIAT FOR THE GRANTEES IN 1981

During 1981 approximately 200 invoices were paid, of which:

2	from Australia	US\$ 3,600.00
37	from England	27,627.10
19	from France	27,729.50
20	from Germany	25,247.00
12	from Holland	717.25
15	from Sweden	40,392.20
7	from Switzerland	10,027.85
56	from the US	20,842.10
<hr/>		
168	T O T A L	US\$ 156,183.00
===		=====

- NOTES:
- There were also a few from Belgium, the Philippines, Sri Lanka, India and Japan.
 - Many grantees buy their own equipment from these countries directly, but there are no centralized records of their purchases at the IFS Secretariat.

SOURCE: IFS Secretariat

2.i. SOME REMARKS ON THE IMPACT OF THE IFS

Because of the priorities established by the sponsors, only limited time was devoted by the Panel to study the impact of the IFS. Through interviews, field work, and from the information gathered from other sources, the Panel members were able to form a general opinion regarding the impact of the IFS.

The impact of the Foundation can be examined from the perspective of the individual grantees and their careers; of the host institution of the grantee; of the development of scientific and technological capabilities at the national level; of the contribution of IFS grants to development objectives; and of the contributions to the international scientific community.

Considering the relatively small size of the IFS, which has awarded less than 10 million dollars in grants during its eight years of operation, it cannot be expected that the impact of the IFS will be quantitatively significant. For example, in some cases the total annual budget of the IFS is smaller than the annual budget of the host institution of an IFS grantee. Furthermore, the resources awarded through IFS grants are orders of magnitude smaller than the national expenditures in research and development in most developing countries where the Foundation operates.

Nevertheless, the IFS has had a significant qualitative impact on the scientific community of developing countries that is out of proportion with the limited amount of resources it has had.

Impact on the Grantees

The impact of the IFS awards on the career of the grantees has been in most cases of great importance. A large majority of former and present IFS grantees are still doing research and have remained in their countries; the fact that they have been awarded an international grant has contributed to their self-confidence; the need to manage their own research grant has helped them to acquire administrative skills; and in most cases the grant has led to scientific publications.

The grantees have also benefited from the contact with peers at the international level promoted by the IFS, particularly through the workshops and visits by the IFS scientific associates. However, there have been many instances where closer monitoring and technical support by the Secretariat or the Scientific Advisors would have been of considerable help to the grantees.

The general impression is that the IFS grants are not considered a "high-prestige" award that confers great honor on the grantees. However, the fact that they are awarded through international competition constitutes a recognition of the researcher's ability and international standing, and in many cases has helped significantly in advancing his career.

One of the persons associated with the development of IFS since its inception has summed up the impact on the individual grantees as follows:

"By its support of proposals from individual younger scientists, the Foundation is stimulating them to ask scientifically answerable questions that are relevant to

problems of their own countries. These questions are usually quite different from the research problems suggested by their professors during their graduate studies in European and North American universities. These young people are learning that asking the right question is the essence of creative science. They are also gaining in self-confidence, scientific knowledge, and experimental skills. Confidence is strengthened by the very act of approval of a proposal by the IFS Board of Trustees, with its distinguished international membership. It is further enhanced by face-to-face communication with colleagues who are working on the same kind of research problems, in workshops, symposia, and "affinity groups" sponsored by the IFS, and by opportunities for discussion with IFS senior scientific advisors from both industrialized and developing countries."*

The evidence gathered by the Evaluation Panel members confirms the general views put forward in this quote.

Impact on Host Institutions

The impact on the host institutions is more difficult to assess. While the IFS resources represent a minimum proportion of the host institutions' research budgets in the majority of cases, in a few cases the foreign exchange provided by the IFS grant is of great importance. In addition, when a piece of scientific equipment is purchased by the grantee, it can be made available to other scientists in the institution, and in this way contribute to the general research activities of the host institution. However, some cases have been reported where an IFS grant has just liberated resources for the institution to

* Roger Revelle, "The International Foundation for Science: good start, but miles to go", Bulletin of the Atomic Scientists, November 1981, p. 28.

conduct research in other priority areas. There are also instances where the IFS grant appears to have upset the established mechanisms for defining priorities at the research institute, primarily because the direct contact between the grantee and the Secretariat is perceived as by-passing the lines of authority of the host institution. While there are always exceptions to the general rule, it appears that the award of IFS grants do not induce rivalries among scientists in a given institution.

Impact at the National Level

The impact of the IFS on the build-up of scientific capabilities at the national levels in developing countries has been marginal in terms of the amount of resources and the number of grantees it has supported. Some countries in Latin America and South East Asia constitute exceptions to this general rule, and the number of grantees represents a significant proportion of the total number of young researchers in the scientific areas supported by the IFS. The main impact at the national level has been on morale building, through the international recognition that young scientists receive. The IFS has also had a demonstration effect in the sense that scientists who learn that colleagues have received grants, are motivated to submit proposals to the IFS and to other international funding agencies.

The question of whether the research conducted with support from the IFS has had a significant impact on development objectives is rather difficult to answer. A report prepared by Louis Berlinguet* indicated that in a few cases the IFS grants have led directly to results

* Louis Berlinguet, Exploratory Study on Practical Applications of IFS Projects, IFS Secretariat, August 1980.

that had practical value and even to operations on a commercial scale. However, this appears to be the exception rather than the rule, and the performance of the IFS should not be judged in terms of the direct contribution of the grants to development objectives.

Scientific Impact

It is also rather difficult to evaluate the scientific impact of IFS grants, at least within the scope of an evaluation effort like the present. There are indications that a significant number of IFS grantees have been doing top quality research that would be acceptable by international standards. On the other hand, Scientific Advisors, Project Secretaries, and persons interviewed during field work, expressed their opinion that there was also a large number of grantees doing work of average quality, and several whose work was less than adequate.

However, without information gathered through the continuous monitoring and assessment of the progress of grantees in their research projects, and without a detailed evaluation of research results, it is impossible to venture any conclusions regarding the quality of research. Furthermore, the situation varies considerably from region to region, from country to country within region, from institute to institute in the same country, and even from grantee to grantee within the same institution. Therefore, no general conclusion can be reached by the Evaluation Panel, except that the quality of the research to follow with IFS grants seems, on the main, to have been adequate.

There are also indications that several grantees are performing research of the highest caliber, as evidenced by the publication of the proceedings of two IFS workshops

T A B L E N ° 37

IFS SCIENTIFIC PUBLICATIONS

Proceedings from IFS Workshops

1. Tropical Mycorrhiza. Kumasi, Ghana. September 1978.
2. Acquaculture. Penang, Malaysia. September 1978.
3. Yams & Ignames Buea, Cameroon. October 1978.
4. Rabbit Husbandry. Morogoro, Tanzania. December 1978.
5. Taro and Cocoyam. Baybay, Philippines. September 1979.
6. Camels. Khartoum, Sudan. December 1979.
7. Acquaculture II. Abidjan, Ivory Coast. November 1979.
8. Animal Production Systems for the Tropics. Aborlan, Philippines. May 1980.
9. Giant Prawn 1980. Bangkok, Thailand. June 1980.
10. Acuicultura III. Monteria, Colombia. April 1981.
11. Edible Aroids. Suva, Fiji. November 1981
12. Training in Mycorrhiza Research Techniques, Serdang, Malaysia. May 1982.

B_o_o_k_s

1. Tropical Mycorrhiza Research, Oxford University Press, 1980.
2. Yams/Ignames, Oxford University Press, 1981.
3. Giant Prawn, Elsevier, 1981.
4. Acquaculture I, Elsevier, 1980.
5. Acquaculture II, Elsevier, 1982.
6. Edible Aroids, Oxford University Press (in press).

by leading publishing houses like Oxford University Press and Elsevier. The proceedings of other workshops reproduced by the IFS Secretariat have also been reviewed favorably. Table No. 37 shows a list of these proceedings. Therefore, as a whole, and considering that the IFS is an institution that takes greater risks in providing assistance to young scientists in developing countries, it is clear that the quality of the research it is supporting is adequate enough.

Furthermore, approximately 40% of the grantees that responded to the Secretariat's questionnaire on publications indicate that they have published an average of over 10 papers, with a handful of grantees publishing more than 30 papers. This shows that the research conducted by a sizable proportion of IFS grantees has led to scientific results of publishable quality.

C H A P T E R 3

CONCLUSIONS AND RECOMMENDATIONS

The preceding chapters have summarized the main findings of the Evaluation Panel. On the basis of these findings, of additional information gathered during the evaluation, and of a careful consideration of the views put forward by the persons consulted, the Panel has arrived at several conclusions regarding the performance of the IFS and formulated specific recommendations on several aspects of its operations. However, before stating these conclusions and recommendations, a few general remarks and recommendations are appropriate.

The effectiveness of the IFS has been, in large measure, the consequence of several characteristics of the IFS style of operation which the Evaluation Panel would like to emphasize and recommend that they be maintained.

These are:

- It is desirable that the implicit and spontaneous division of labour that has emerged between the IFS, on the one hand, and institutions such as IDRC, UNDP, FAO, CGIR, World Bank, etc., on the other, be maintained. IFS should focus exclusively on the small personal grants that help young developing country scientists in their transition from graduate work towards fully-fledged and active members of the scientific community. There is a clear need for an institution to provide support to young scientists in developing countries and no other international institution working in this way in the fields covered by the IFS. While several bilateral and multi-

lateral institutions give support to research projects, they provide little assistance for relatively inexperienced individual researchers.

- The IFS does not at present, and should not in the future, support the application of research results on a large scale or commercial basis. The prime responsibility for exploiting research results must lie with the institutions in the host country. However, there is a continuum between the sort of research results likely to emerge from an IFS grant and final commercial exploitation. Other donor agencies may be encouraged to provide support for parts of this continuum as they have done in the past (for example, IDRC in the case of a fisheries project.).
- The IFS should keep its multilateral character in the sources of funds, with financial resources obtained from a variety of donor agencies, and its international character in the granting process, with grantees and advisors being drawn from many countries. In the style of operation of the IFS there is no room for bilateral agreements negotiated with specific donors for the provision of funds through the IFS. The IFS should continue to operate as a truly international foundation and sponsors must continue to provide their financial contributions without conditions or "strings". However, the possibility of counterpart funding by local agencies in the host countries should be explored.
- The size of an IFS grant should remain below US\$10,000 per year in real terms, and the salary of the researcher should continue to be excluded. the present maximum of three grant renewals should be maintained.

- The present range of services provided to grantees in the purchase of equipment and the provision of expendable supplies should be maintained. The involvement of scientific advisors and project secretaries in providing literature and bibliographical assistance to grantees should be expanded, and consideration should be given to the organization of a larger number of regional workshops in specific scientific areas.
- Considering that a prevalent problem in research laboratories in developing countries is the non- or malfunctioning of scientific equipment, the IFS should permit the inclusion of an item for the servicing and repair of scientific equipment as part of the budget of the grant.
- The IFS supports scientists in seven fields of the biological sciences and rural technology. No significant addition to these selected fields should be undertaken in the short term but expansion should proceed in a gradual way to cover closely related fields. Grants should also be made available for social scientists who wish to do research on the social and economic implications of discoveries in the scientific fields covered by the IFS. This will imply the expansion of the panel of scientific advisors to include appropriate distinguished social scientists.

The evidence found during the evaluation suggests that the IFS has achieved its objective and fulfilled its role rather well during its 8 years of operation. The general opinion of grantees, Scientific Advisors, the staff of National Member Organizations, and the Secretariat staff, is that the IFS is a useful, flexible, responsive and efficient organization. However, the Evaluation Panel has identified several issues that should be examined carefully by those concerned about the IFS operations, in order to ensure that the IFS continues to operate effectively and remain a highly regarded organization.

3.a. READJUSTMENTS IN THE ORGANIZATIONAL STRUCTURE OF
THE IFS

The organizational structure of the IFS, and its management style in particular, are well suited to fulfill the IFS objectives. The personal and sympathetic way of dealing with grantees, the flexible and non-bureaucratic mode of operation, the relatively simple requirements for grant applications, and the range of services provided to grantees, make the IFS an attractive funding organization, and one that is highly regarded by the international scientific community in developed and developing countries.

However, a flexible and non-bureaucratic style of management implies a certain diffusion of decision-making authority and looseness in organizations. A reasonable balance between flexibility and formalized lines of authority, decision, and responsibility should be attained, particularly in view of the accountability requirements of the funding agencies that provide resources to the IFS.

The Evaluation Panel has reached the conclusion that, while the basic style of operation of the IFS should be maintained and reaffirmed, there is a need for certain readjustments in the organizational structure. These readjustments should help in maintaining the appropriate balance between flexibility and formalism, while at the same time keeping the operation of the IFS responsive to the needs of grantees, improving the efficiency of the IFS, and facilitating accountability for the sponsoring agencies.

The principles and criteria for readjusting the organizational structure of the IFS are derived from the variety of observations made during the conduct of the IFS evaluation. The members of the Sponsors' Committee have made it clear that they feel uneasy about what they perceive as a diffusion of authority; many Scientific Advisors view their role as policy-making rather than providing advise; some staff members of the IFS Secretariat have indicated their concern regarding the lack of established procedures for certain tasks; and a former member of the Executive Committee indicated that in practice this Committee's decision-making role especially with regard to the granting process was fairly limited, a view shared by some IFS staff members.

Furthermore, the present system of processing grants appears to be too demanding and time-consuming for the Project Secretaries, who have to prepare reports for the meetings of Scientific Advisors, the Executive Committee, and the Board of Trustees. There is a total of 18 meetings per year (14 of the Advisory Groups, 1 of the Executive Committee, 1 of the Board of Trustees, 2 of the Sponsors' Committee) which have to be serviced by a small Secretariat, even without counting meetings related to workshops, and the General Assembly meeting that takes place every 3 years and requires substantive preparation from the IFS Secretariat. There are also peaks in the processing and approval of grants, with a cycle of 6 months that culminates in the meetings of the Executive Committee and the Board of Trustees. All of these activities disrupt the work of the Project Secretaries.

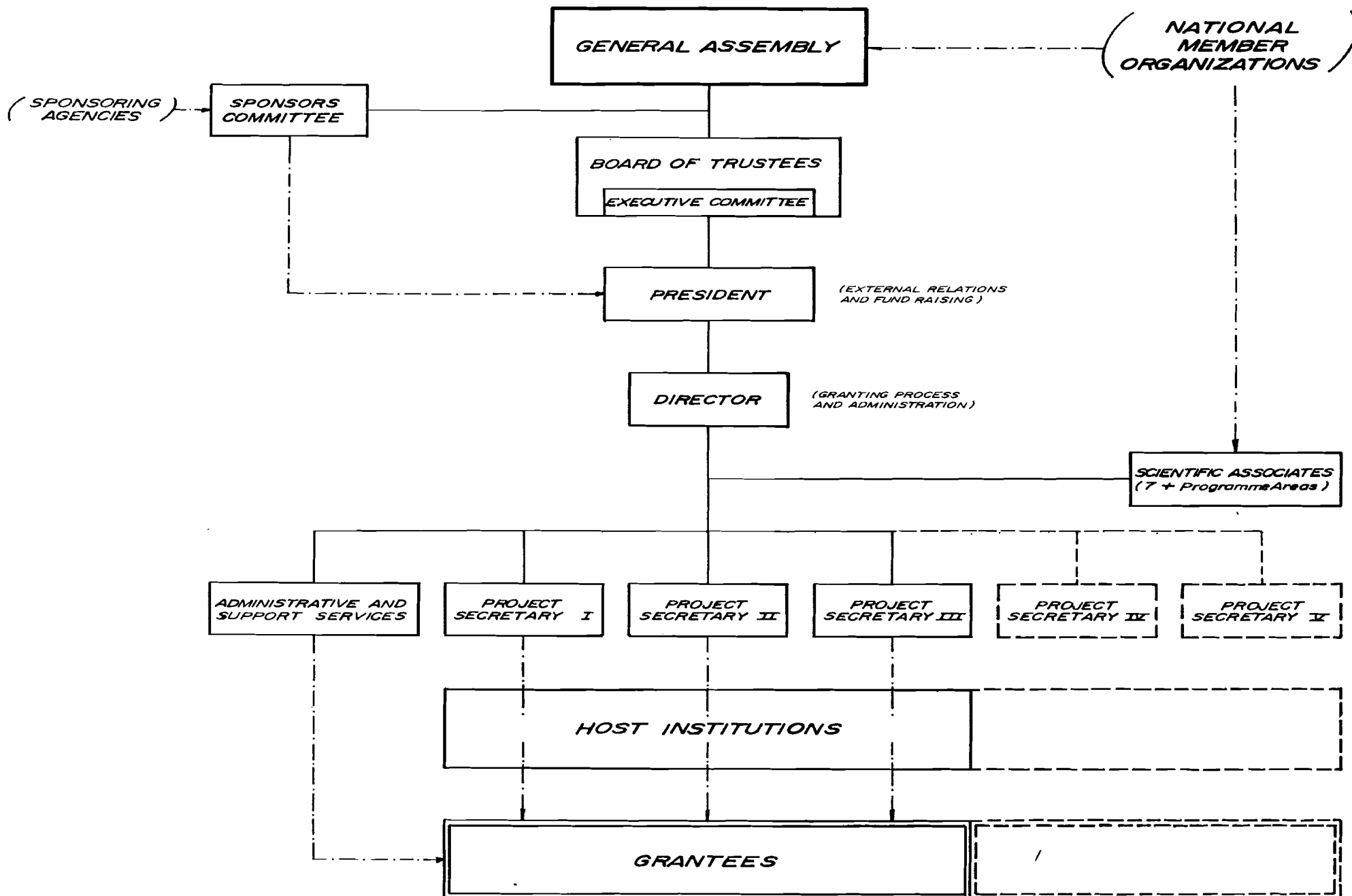
The Evaluation Panel has concluded that it is necessary to clarify the lines of authority for decision-making

within the IFS. There appears to be a confusion regarding policy-making and decision-making roles in some aspects of the IFS operation, and there is also a need to focus more sharply the roles of the Board of Trustees, the President, and the Director of the IFS. At the same time, it would be useful to simplify and streamline even more the organization and procedures of the IFS, particularly with regard to the granting process. Figure No. 23 shows the proposed organizational structure.

The Board of Trustees must retain the authority and bear ultimate responsibility for the conduct of the IFS, although it should delegate some decisions to the Executive Committee. However, issues related to the future directions for the IFS should be dealt exclusively by the Board of Trustees, with the assistance of ad-hoc groups, advisors and consultants as required.

The need for building a broader and more supportive constituency for the IFS in the developed and in the developing countries, and for engaging in fund raising activities in a continuous and systematic way, requires a more active Presidency for the IFS. The President should take the responsibility for these time-consuming and difficult tasks, which have to do mostly with the external relations of the IFS. This would give the Director the opportunity to concentrate all his efforts on the day-to-day technical and administrative management of the Foundation. The Director should be given greater authority and responsibility regarding grant approvals, always under the supervision of the Board of Trustees, which would delegate granting decisions in the Director and the Executive Committee, subject to ex-post review. The conduct

PROPOSED ORGANIZATION CHART FOR THE INTERNATIONAL FOUNDATION FOR SCIENCE



of administrative affairs of the Foundation should be the exclusive province of the Director, who would be answerable directly to the Board of Trustees.

Taking into consideration these issues, the Evaluation Panel recommends that:

- 1) The basic organizational structure of the IFS should be maintained, with the General Assembly being the overall maximum authority, meeting every 3 years and nominating the Board of Trustees; with the Board of Trustees being fully responsible for the management of the IFS. While the Board of Trustees should meet once a year, there should be no fixed meetings of the Executive Committee; it would be consulted by mail in most cases, and meet only in extraordinary circumstances at the request of the Director and the President of the IFS. With the Board of Trustees taking full responsibility for the future directions of the IFS, there is no need for a Programme Committee, and the Board could request advice and assistance on matters referring to the future of the IFS on an ad-hoc basis.
- 2) The President, who is Chairman of the Board of Trustees, should be given greater authority and a larger role in building a constituency for the IFS, and should be responsible for fund-raising activities working in this regard in close collaboration with the Sponsors' Committee.

- 3) The Director should be given more authority and responsibility for the approval of grants, in consultation with the Scientific Advisors, following procedures similar to the one suggested below in the section on granting process. The Board of Trustees should allocate time at its annual meeting to review a detailed report on the granting programmes, the participation of Scientific Advisors, and general decisions taken by the Director regarding the approval of grants. This implies eliminating the fixed schedule of meetings of Scientific Advisors, who would be consulted by mail, and meet only to discuss specific issues upon the Director's request.
- 4) In order to provide better service to grantees, particularly with regard to the identification of possible new grantees and the provision of advice and guidance to those that have been awarded IFS grants, the number of Scientific Advisors should be expanded to double its present size, with increased participation from developing country and non-Scandinavian advisors. Measures should be taken in order to ensure that those advisors that participate in the identification of potential grantees are not also given the sole responsibility of evaluating grant requests.
- 5) The number of Project Secretaries should be increased, with a third Project Secretary to be incorporated immediately (preferably a Spanish-speaking Project Secretary), and then expanded gradually according to requirements and the growth pattern envisaged for the IFS, to a maximum of 5 Project Secretaries for the present range of scientific areas covered by the IFS.

- 6) The Sponsors' Committee should work in close collaboration with the President to raise additional funds for the IFS. It should also serve the purpose of providing a forum for the exchange of views among the IFS funding agencies about the IFS and its operations.

3.b. CHANGES IN THE GRANTING PROCESS

The granting process has, on the whole, functioned efficiently during the first 8 years of operation of the IFS, even though the Evaluation Panel has identified the need for introducing some changes. These changes are aimed at widening the pool of potential grantees, speeding up the decision time on grant applications, and making more transparent the process of and criteria for awarding grants. The general idea is to build even closer links between the international scientific community and IFS grantees, while also strengthening the research capabilities of individual grantees. Furthermore, these changes are also designed to ensure that the contribution of the Scientific Advisors is effectively made use of, and that they advise rather than take decisions or make policies.

The need for modifications in the granting process is derived from observations made during the conduct of the evaluation. For example, the evidence from the statistical analysis of IFS grantees show that the world distribution of grants among regions and countries is uneven; many advisors have commented that they know of relevant institutions which have never housed an IFS grantee; there have been complaints from grantees, and from some advisors, regarding the length of time it takes to obtain a decision on a grant; and there have also been complaints from some advisors, grantees, member organizations and many Sponsors of a lack of information regarding criteria used in approving grants, to which it must be added the frustration of those who do not receive grants and never learn the reasons why their applications were rejected. In addition, there is the potential conflict between criteria referring to the project

and those referring to the individual scientists, which several advisors and Secretariat staff members referred to.

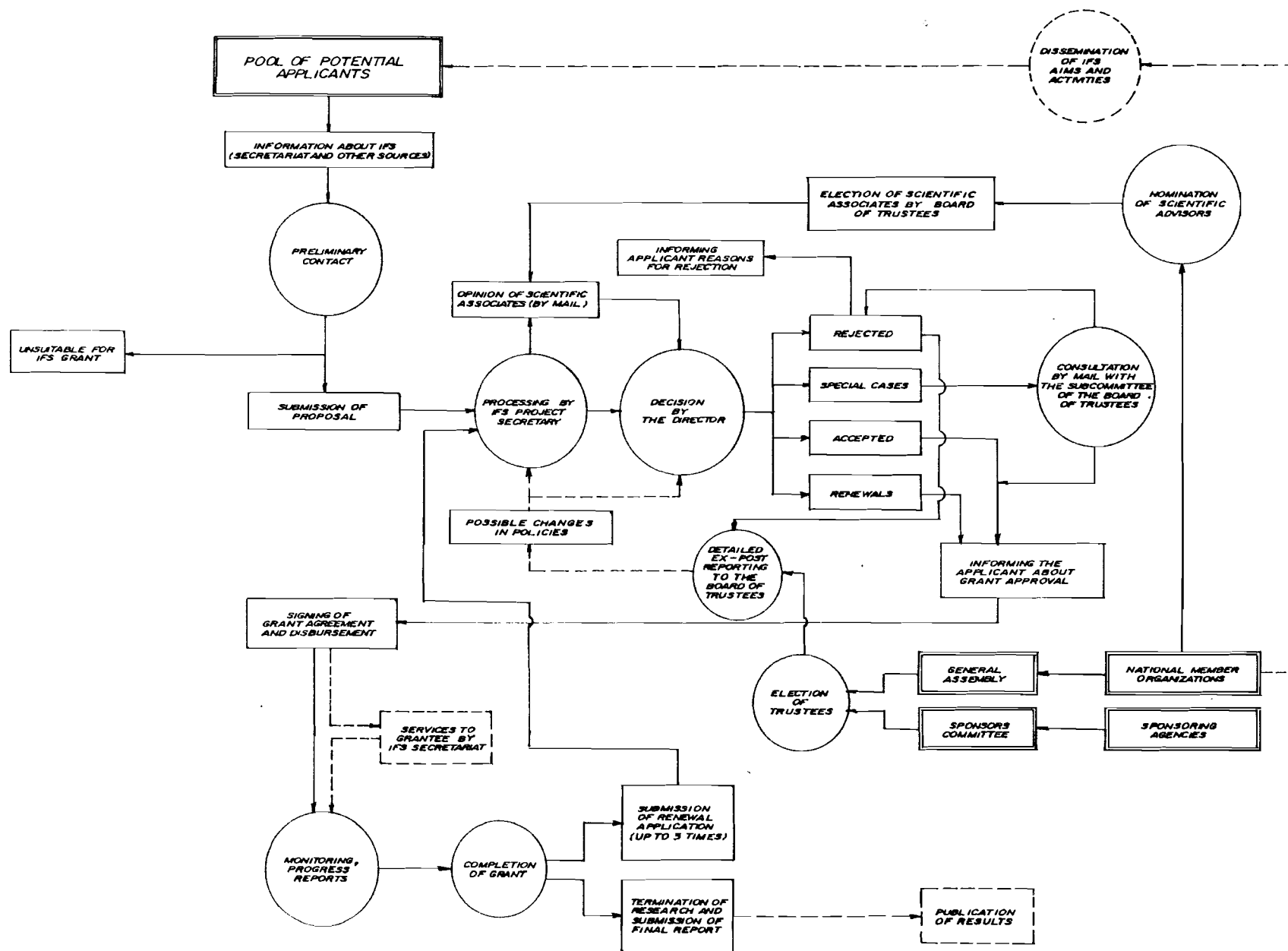
Furthermore, many grantees have requested greater scientific advice in the conduct of their research; many advisors have expressed the view that some form of help should be provided to potential grantees in the formulation of research proposals; and there is also the almost unanimous view of advisors who believe that they and their colleagues could be of help to grantees in the course of their research by providing advice (particularly in the preparation of papers for publication).

Finally, several advisors shared the view that, although most grantees were doing excellent work, there were too many whose quality of work was low, and others who did not themselves do the research but hired assistants to do it for them. This implies the need for more monitoring of grants to satisfy the Board of the IFS and the Sponsors that scientific quality is being achieved and international standards are maintained.

Taking into account these aims and findings, the Evaluation Panel recommends the following modifications to the granting process (see Figure N°24):

- 1) The number of Scientific Advisors should be doubled. The term of appointment should be 3 years, with the possibility of renewal. Scientific Advisors should be appointed by the Board of the IFS from a slate of candidates submitted by National Member Organizations, the Sponsors and the Director. The criteria for appointment to Scientific Advisor should be scientific excellence and a willingness to commit oneself to the IFS objectives and style of work.

FIGURE 24



The Advisors would have three functions:

- (i) To help identify potential grantees;
- (ii) To help in the process of evaluating grant applications;
- (iii) To visit grantees in the field
 - at the request of the IFS Secretariat for monitoring purposes; and
 - at the request of the grantee for the purpose of providing advise and assistance.

The Advisor that identifies a potential grantee should not formally involve in evaluating that grantee's application, and it may even be desirable to establish a special category of Advisors who are exclusively involved in evaluating grant applications.

When a grant is awarded, the grantee should be given the name of one or more Scientific Advisor. The Secretariat should emphasize that this is an IFS service, and is not intended to impose a scientific supervisor. Much of the advice and comments on each paper for publication can be provided by correspondence. Occasionally field visits may be required but these should only take place at the request of the grantee and with the approval of the Director, or at the request of the Director.

In order to ensure that this new activity of the Advisor is carried out with a minimum cost to the IFS, Advisors should inform the Secretariat of the IFS about travel plans to countries with IFS grantees. The IFS would notify the grantees in the area who could request the Advisor to do a monitoring visit to assess the progress of a particular set of grantees. The per-diem and extra air fares caused by a

deviation in route would be paid by the IFS. Measures should be taken to ensure the follow-up to the visits of Advisors by the Secretariat, and the additional functions to be assumed by Advisors are likely to require additional time from the IFS Secretariat. The possibility of obtaining additional funds for this service should be explored.

- 2) The present pluralistic way in which grantees are identified should be maintained and, if possible, expanded. Project Secretaries, Scientific Advisors, National Member Organizations, present and former grantees, all have an important role to play in alerting potential applicants to the existence of the IFS and its granting programme. Furthermore, new mechanisms to identifying potential grantees should be explored, such as publicising the IFS in journals and magazines, distributing IFS posters, contacting developed country universities where developing country scientists obtain their degrees, etc. However, "block grants", or the allocation of funds to a region to be disbursed by member organizations should not be a part of the IFS operation.
- 3) In order to speed up and simplify the granting process, it is suggested that the following procedure be considered as a basis for discussion by the IFS Secretariat and the Board of Trustees:

The Director should circulate the proposals by mail to 5 Scientific Advisors in the relevant scientific disciplines, who would be asked to comment on both the scientific merits of the application, the abilities of the applicant and the relevance of the research.

At least one of the Advisors should be familiar with, and preferably resident, in the applicant's country or region. A time lapse of several weeks should be allowed from mailing the proposal before the Director makes a decision on the grant. If at least 3 of the Advisors recommend support, then the Director should have the authority to proceed immediately to approve the grant. A failure to reply would be interpreted as being a vote in favour of the grant.

Should the majority of the Advisors reject the application, but the Director still believe that the individual is worthy of support, then he should be able to put his case, including the Advisor's comments, by mail to the Executive Committee. The majority verdict of this Committee would be binding on the Director.

Putting into effect this procedure would imply greater responsibility for the Director, and would make it possible to communicate decisions on most grant applications more quickly than at present. There would be no need to wait for meetings of Committees. The Director's decisions and actions would be reviewed ex-post at the annual Board of Trustees meeting.

A major difference between this procedure and that currently employed is that it removes the necessity for the 14 Advisors Committee meetings (two for each of the 7 programme areas). However, it still may be useful for the Director to convene occasional meetings of Advisors to advise him on criteria for evaluating proposals in the different programme areas. However, these meetings should not be held to make

decisions about grants, and these decisions should be the exclusive responsibility of the Trustees and the Director.*

Furthermore, the justification for the costs of 14 Advisors' meetings per year in air fares, and specially in Secretariat time, seems hard to justify when, according to the IFS Secretariat, the Advisors confirm the Project Secretaries' opinions in 85 to 90% of the cases. Taking into account this degree of consensus, the proposed new system will economize resources and streamline procedures, without increasing significantly the risk of making mistakes.

- 4) The IFS should prepare a set of guidelines to help potential grantees prepare better proposals. Furthermore, the criteria used in selecting IFS grantees be made more explicit and disseminated more widely so that National Member Organizations, Research Centres, Universities and potential applicants are made aware of the criteria employed by the IFS in awarding grants. Finally, it is also recommended that rejection letter should explain, as far as possible, the reasons for the rejection, so that even the applicants who are not awarded a grant can learn from the experience of applying.

* This new procedure is likely to be supported by many of the present Advisors, although a few will continue to argue for semi-annual meetings of a few Advisors to develop policy and make decisions about grants. However, as one eminent Scientific Advisor wrote: "The role of the Advisors should be to advise not to govern. If an Advisor wishes to govern he should get himself elected to the Board of Trustees."

3.c. READJUSTMENTS IN THE IFS GRANTS

The unanimous opinion of the persons interviewed and contacted during the evaluation is that the IFS grants should retain their basic structure and size, and that the services provided by the IFS with the grants should also be continued. During its 8 years of operation the average size of an IFS grant has been approximately US\$6,400, with little difference between the first grant and successive renewals. The present structure of grant budget items -in which equipment accounts for nearly half of the grant, expendable supplies for about a quarter, and the rest of the grant being divided between travel, literature, salaries for assistants and miscellaneous expenses- has been found adequate. In addition, there is consensus that no changes should be introduced in the policy of not covering the salary of the researcher. Grant renewals should continue being given first priority, and the possibility of having multiyear programmes of work with annual renewals should be maintained.

Grantees value highly the services associated with grants, and this is also the view of many Scientific Advisors. For those grantees that request it, the IFS should continue purchasing and shipping scientific equipment, which requires that freight costs be included in a grant award. The purchase of expendable supplies, the provision of literature, the organization of workshops, and the support for travel expenses to visit other IFS grantees or research institutions should also be maintained. Furthermore, as the role of the Scientific Advisors in providing assistance to the grantee expands, provisions should be made to support additional travel expenses of Scientific Advisors as a

service to the grantees. Many grantees, especially those in countries with foreign exchange restrictions, value the possibility that a portion of the IFS grant be retained in Stockholm, to be disbursed at the grantee's request. This practice should be continued in an ad-hoc fashion.

To improve the effectiveness of the grant there are also some adjustments that could be introduced. In this regard, the Evaluation Panel recommends that:

- 1) The present ceiling of US\$10,000 per grant per year, with an average of about US\$6,400, appears to be rather limiting. The size of grants should be kept constant in real terms allowing increases for inflation, particularly with regard to the budget items referring to scientific equipment. This may require continuous readjustment of the upper limit, and probably the average size of the grant should also be increased accordingly. However, when there is a choice, it is more important to have a larger number of relatively small grants than fewer larger ones. The average size of the IFS grants, and the limits imposed on them, should not increase significantly to the point that they would become project grants rather than individual awards.
- 2) The number of grants should be increased to approximately double the present size, reaching an average of 200 new grants per year within the next 5 years, while remaining in the same scientific areas that the IFS is operating at present, with possible minor adjustments. The number of potential grantees is increasing rapidly in the developing countries, and the IFS should try to keep with the pace of their increase. This has important implications with

regard to the need for diversifying the sources of funds for the IFS, and will require a more active role in fund raising in the part of the IFS authorities.

In addition, this would have important implications for increases in the Secretariat staff, and the enlargement of the Panel of Scientific Advisors.

- 3) An effort should be made to keep at least the present ratio of 2 applications for each grant approved, while allowing for possible regional differences. This will require greater effort in identifying potential grantees, although the combination of 5 Project Secretaries and a larger pool of Scientific Advisors should be adequate for dealing with the increases in the number of applications. The notion of seconding Project Secretaries to the IFS Secretariat by national aid agencies (as has been done by France and now Germany), is a good initiative and should be further encouraged in order to keep the IFS Secretariat costs within reasonable limits.
- 4) At present about 62% of the IFS budget are given directly to grantees, 17% is allocated to grant-related services, and the rest allocated to support activities and administration. This overall distribution should be kept without major changes, and measures should be adopted to hold administrative expenses at their present level.
- 5) The possibility of grouping grants around a problem area, covering various interrelated topics and extending over more than one scientific area covered by the IFS should be explored.

It is especially recommended that some grants provided to enable researchers to conduct socio-economic studies of the impact of modern science and technology, particularly if these studies are carried out in conjunction with research supported by other IFS grants.

3.d. RECOMMENDATIONS ON THE IFS GRANTEES

The main objective of the Foundation is to support young developing country scientists, helping them to become full members of the international scientific community. As one senior staff member of the IFS put it, the product of the IFS is "a research atmosphere with a young scientist at the centre". From the observations made during the evaluation, it is possible to conclude that the IFS grantees have been, in the great majority of cases, precisely those young scientists to whom the IFS was originally established to help.

Most IFS grantees are between 33 and 37 years old, with the next most numerous group being in the 28-32 years range; they have had a few years of training or have recently completed their graduate degree; and have also just began their publishing career. Few cases of transfer of grants from one individual to another within the same project have been observed (less than 5%). Furthermore, the information available from the IFS Secretariat regarding progress reports, and that obtained through a questionnaire sent to the grantees, indicates that at least 90% of the grantees are still doing research or working in research-related activities.

While many Advisors, some staff members, and even a few grantees contacted during the evaluation have been disappointed by what they perceive as unexciting and even mediocre quality of the research performed by IFS grantees, particularly because many have not lived to the expectations raised in their proposals, there is a relatively large number of grantees that have done research of international scientific caliber, and this has lead to the publication of many papers and reports (and even three volumes of collected papers and reports of the IFS workshops).

There is a sizable number of grantees that have not provided the IFS Secretariat with periodic progress reports, and many of the reports received by the Secretariat are rather poor. Most grantees interviewed during the evaluation have expressed their desire to receive assistance from senior scientists, and indicate they would like to have more frequent contact with the IFS Secretariat, or the IFS Advisors, regarding scientific and technical issues arising in their research.

On the whole, the Evaluation Panel has concluded that the IFS is reaching the target groups it set out to reach, and that it is providing young scientists in developing countries with opportunities that would not be available if the IFS did not exist. At the same time, it must be recognized that, as the number of young developing country scientists in the fields covered by the IFS expands, the number of potential grantees is increasing rapidly, and that the Foundation should increase its granting programme in order to retain its present level of impact.

Nevertheless, the Evaluation Panel has identified a few changes that could improve the impact of the IFS on the career and performance of its grantees. In this regard, the Panel recommends that:

- 1) The IFS grants should continue to be given to individuals and not to projects. The emphasis should remain in assisting young scientists, with "young" being interpreted as initiating an independent career in scientific research, and not necessarily in age. A grant should not be transferred to another person if the original grantee abandons the work, unless the Executive Committee approves it.

- 2) Greater efforts should be made with regard to the follow-up and monitoring of grantees. Scientific Advisors should play a major role in this regard, but only at the request of the IFS Secretariat. Project Secretaries should also increase their time allocation to monitoring tasks. Better procedures should be devised to request and process progress reports by the grantees, designing forms for this purpose and establishing a calendar of progress reports should continue on being a pre-requisite for grant renewals.
- 3) Scientific Advisors should play a major role in linking grantees to the international scientific community, informing them of academic meetings and other events, providing them with access to literature, and steering grantees towards the publication of research results. The IFS Secretariat should also promote the establishment of closer links among the IFS grantees, and the Secretariat should explore the possibility of publishing an annual or semi-annual Newsletter for the IFS community.
- 4) Both grantees and Advisors have highlighted the value and importance of regional workshops, with several Advisors considering them the best investment that the IFS can make in services to grantees. These workshops have lead towards building lasting contacts among developing country scientists, and should be encouraged in a systematic and more intensive way. Field trips and visits should always be included in regional workshops. Furthermore, the opportunities for exchange visits between grantees should continue on being provided on an ad-hoc basis.

3.e. THE ROLE OF NATIONAL MEMBER ORGANIZATIONS AND
HOST INSTITUTIONS

National Member Organizations

During the evaluation it was found that National Member Organizations have a limited role in the present operations of the IFS and yet, ultimately, they are the constituents of the organization. In a few countries it is mandatory for the IFS to work through the member organization, but where this is not the case the actual involvement of the National Member Organizations is mostly marginal. This is especially the case of most Member Organizations in the developed world.

The Panel has reviewed the pattern of membership and concludes that there is merit in incorporating more research councils from the developed countries. The role and function of academies and research councils varies considerably from country to country, and while the IFS comprises a large number of very different institutions, there is room for extending this pluralistic approach in order to enable the greatest involvement of the scientific community in the various countries concerned with the IFS.

For National Member Organizations to play a larger role in the IFS activities, the Evaluation Panel recommends that;

- 1) National Member Organizations should nominate Scientific Advisors distinguished for their scientific work in the IFS Programme Areas. The final choice of Advisors would be made by the Trustees from the names submitted by National Member Organizations, Sponsors and the IFS Director.

- 2) National Member Organizations should help in developing a constituency of support for IFS activities among the scientific community. Funds for the IFS ultimately come from government sources in the donor countries, and the decision to allocate funds to the IFS rather than other activities would be helped if there were greater support and pressure from the scientific community. The developed country National Member Organizations should play a greater role in creating this constituency of support, and should work closely with the President of IFS to this end.
- 3) The developing country National Member Organizations should play a greater role in the dissemination of information about IFS to potential grantees. For this the IFS should consider producing brochures in the working languages of the constituent member organizations, and should also produce and distribute a broader range of descriptive material regarding IFS activities. The possibility of advertising in scientific journals and magazines should also be considered.
- 4) To keep the National Member Organizations better informed of the activities of the IFS an IFS Newsletter should be produced. In addition, the Secretariat should advise the relevant National Member Organization in the host country whenever a grant is awarded to a scientist in that country.

Host Institutions

The IFS grants are, in a very real sense, collaborative endeavours between the Foundation and the host institutions that pays the grantee's salary during the lifetime of his project. Furthermore, according to established procedures, the host institution must endorse the grantee's application before it is considered for evaluation by the IFS Secretariat.

The Evaluation Panel has found that there were cases in which there was lack of communication between the IFS and the grantee on the one hand, and the host institution on the other. This has sometimes led to a degree of tension, at least as perceived by the host institution's authorities. Considering that the success of a granting programme like that of the IFS depends to a large extent on the goodwill and cooperation of the host institution, the Evaluation Panel recommends that:

- 1) The IFS Secretariat and the potential grantee should keep the host institution fully informed of major events in the lifetime of a grant which is given to a scientist in that institution. For example, copies of letters to the grantees should be sent to the officers who endorsed the application in the host institution.
- 2) The IFS Secretariat should continue the practice of requesting the opinion of the host institution for grant renewals as an input into decision-making.
- 3) The IFS Secretariat should consult periodically with the host institutions and obtain from them their suggestions for the granting programme. For example, suggestions on potential grantees, and possible new areas within the field of interest should be solicited.
- 4) The host institution should be put on a mailing list for any newsletters which may be prepared by the IFS.

3.f. OTHER RECOMMENDATIONS: SCIENTIFIC AREAS, FUNDING PATTERNS, AND THE IFS SECRETARIAT

The Evaluation Panel did not cover the scientific areas, funding patterns and Secretariat operation in sufficient detail to make specific recommendations on these aspects of the Foundation's activities. Nevertheless, a few remarks could be made to complement the ideas put forward in the preceding section.

The scientific areas in which the IFS operates at present should be maintained and a new area, or component within existing areas, referring to the socio-economic implication of technical change should be added. This could begin by awarding grants to study the social and economic consequences of the application of research findings in other areas supported by the IFS, and expand gradually into new problems to conform a new scientific area in a few years.

Before considering whether to expand its operations to other scientific fields, the Board of Trustees should commission in depth studies of possible areas. Several suggestions of possible fields were made to the Panel during the review. For example, the field of tropical diseases and traditional medicine was mentioned as an interesting area to explore, and similar remarks were made with regards to arid zones, cash crops and integrated production systems. However, the Evaluation Panel does not envisage a move towards totally unrelated areas such as physics, mathematics, engineering sciences, or geology.

It is difficult for the Panel to offer specific recommendations regarding the Patterns of Funding, except to

note that the situation of multilateral financial agencies, which depend on contributions from donor countries, is likely to worsen during the 1980s, and that the IFS should take immediate action to anticipate possible difficulties in obtaining financial resources in the future. The recommendations regarding organizational adjustments, which envisage a more active role for the President in fund raising, are directed towards this end.

F I N A L R E M A R K S

The general conclusion of the Evaluation Panel was that the IFS has fulfilled its mandate to support young scientists in developing countries. It is doing this in a personal, flexible and effective way which seems to be unique among international organizations. However, there is room for improvement in the operations of the IFS and the Panel hopes that the present report will be of assistance in this regard.

In an earlier evaluation of the IFS, Professor Stephan O. Awokoya, made the following statement:

"The success of the IFS is due to the small research grants awarded to young scientists, the rigorous selection of the grantees by expert panels, the fields of applied biology chosen, the quality of supervision, advice and guidance, the excellent administration of the Secretariat, the choice of subjects for investigation, the motivation of the young scientists in pursuing subjects relevant to their environment, the human relationships engendered, the opportunity for international expertise in developing countries without brain drain, and the credibility of the IFS as an international foundation."

The Evaluation Panel that prepared the present report shares, in general terms, the views of Professor Awokoya. However, the Panel members also recognize that the IFS could benefit from certain readjustments in its structure and operations, in order to maintain the very same characteristics and features of the IFS that Professor Awokoya -and the members of the Evaluation Panels as well- have found desirable. Furthermore, the difficult times that multilateral development assistance organizations are going to find in the mid 1980s require that actions be taken now to ensure the continuous expansion of the IFS activities and its effective contribution to the developing countries.

A_N_N_E_X_1

NEW RESEARCH GRANTS

- a. Application Forms
- b. Scientific Advisors
Summary Evaluation Form

International foundation for science * IFS

Sibyllegatan 47
S-114 42 STOCKHOLM
Sweden

RESEARCH GRANT APPLICATION

Applicant	Applicant principal investigator		Male <input type="checkbox"/> Female <input type="checkbox"/>		Institute of the applicant Name and postal address	
	Title					
	First name					
	Family name					Cable Telex
	Nationality		Date of birth		Phone	
	Major field of scientific specialization					Head of Institute
search object	Project title					
	Short summary presentation of the research project					
Project	Funds requested from the Foundation for the first research period (normally not exceeding US\$ 10 000)					
	Project period	Equipment	Expendable supplies	Literature	Travel, salaries and other costs	Total amount requested
		\$	\$	\$	\$	\$
	Other funding organizations (except Institute of the applicant) from which the applicant has received or applied for funds					
Signatures	Foreseen duration of the project, estimated costs			At which date could the project begin?		
	Signature of Applicant			Signature of Head of Institute		
	Date			Date		
A copy of the application has been sent to						

Applicant

Present and past positions. Number of staff supervised by you (also their names and occupation)

Education. Major fields of study, years attended, and names of Institutes

Previous scientific experience (main tasks and results)

Any valuable contacts with other institutes

Recent publications by the applicant (last 2–3 years)

Background	Overall significance of the project in light of the needs of the country
	Describe possible benefits of research results to scientists working in different disciplines in your home country. Have you planned any contacts with national or regional extension services or other possible users of research results? If not, what kind of process would you propose to make use of your research results?
	Earlier results within the research area by the applicant and the associated group. Related work already in progress at the institute of the applicant
	References to relevant literature and to related work performed at other institutes

Project description	Detailed research objectives and expected results

Budget	Equipment	Estimated costs	Requested from the Foundation
		\$	\$
	Subtotal	\$	\$
	Expendable supplies (items which individually cost less than US\$ 100 or have a useful life of less than one year)	Estimated costs	Requested from the Foundation
		\$	\$
	Subtotal	\$	\$
	Literature, subscription for journals, and similar expenses	Estimated costs	Requested from the Foundation
		\$	\$
	Subtotal	\$	\$
	Travel Destination and means of travel. (Long-distance travel subsidized only in exceptional cases. Separate motivation requested).	Estimated costs	Requested from the Foundation
		\$	\$
	Subtotal	\$	\$
	Staff salaries (subsidized only in exceptional cases. Separate motivation requested).	Estimated costs	Requested from the Foundation
		\$	\$
	Subtotal	\$	\$
	Other costs		
	Subtotal	\$	\$
		\$	\$

Facilities	<p>Facilities (localities, equipment) available for the research project</p> <p>Other major costs supplied by the institute (salaries etc)</p>
Administration	<p>With whom shall the agreement be made? The Foundation will normally require a three party agreement between the applicant, the Institute and the Foundation. If the Institute is not entitled to sign an agreement, please indicate an alternative</p>
Other desirable assistance	<p>Please indicate your wishes and suggestions for other arrangements (professional advice, visits, workshops, etc), for which the Foundation might be of assistance to develop your research field in developing countries. Estimation of expenditures for proposed activities is appreciated</p>

*International foundation for science * IFS*

EVALUATION OF IFS RESEARCH GRANT APPLICATION

ADVISER:

APPL. No:

NAME:

COUNTRY:

PROJECT

Problem description	Unclear	Average	Clear
Relation to IFS programme	Questionable	Fair	Strong
Scientific value of a successful result	Little	Modest	Good
Foreseeable use of a successful result	Little	Modest	Good

APPLICANT

Applicant's training and experience	Unrelated	Neutral	Appropriate
Applicant's prospects to execute the project	Questionable	Fair	Good

BUDGET

Overestimated	Appropriate	Under-estimated
---------------	-------------	-----------------

Suggested alterations:

GENERAL COMMENTS

☐ Please check here if you would like to establish direct contact with the applicant, if the project is approved for IFS support

CONCLUSION

Project category: NOT RECOMMENDED 3 2 1

EXPLANATION TO FINAL CONCLUSION

- CATEGORY 1 Project of good research quality, either of scientific interest or with prospects of practical use, and relevant to national or international problems. Project well in line with the IFS research priorities. Capable researcher for the task in question. Valuable part of scientific development in the country or region. ("This should or must be done".)
- CATEGORY 2 Project of reasonable research quality and promise, but of less importance compared to Category 1 projects. ("This could be done".)
- CATEGORY 3 Project of limited research interest and promise. ("This might be done".)
- NOT RECOMMENDED Project of little scientific interest and without prospects of practical application. ("This need not be done".)

A_N_N_E_X_2

GRANT RENEWALS

- a. Application Forms
- b. Scientific Advisors
Summary Evaluation Form
- c. Grant Agreement Forms

International foundation for science * IFS

Sibyllegatan 47
S-114 42 STOCKHOLM
Sweden

RENEWAL RESEARCH GRANT APPLICATION — GRANT No.

To be submitted together with a progress report and a statement of expenditures.

Applicant	Applicant — principal investigator		Male <input type="checkbox"/> Female <input type="checkbox"/>		Institute of the applicant. Name and postal address	
	Title					
	First name:				Cable:	
	Family name:				Telex: Phone:	
	Nationality:		Date of birth		Head of Institute	
	Major field of scientific specialization					
Research project	Project title					
Project financing	Funds requested from the Foundation for this research period (normally not exceeding US\$ 10.000)					
	Project period	Equipment	Expendable supplies	Literature	Travel, salaries and other costs	Total amount requested
		\$	\$	\$	\$	\$
	Foreseen continuation of the project — duration and costs					
	Other funding organizations (except Institute of the applicant) from which the applicant has received or applied for funds					
Signatures				This application is approved and the facilities of the institute, including personnel, buildings, equipment and financial resources will be made available for the applicant		
	Signature of Applicant		Date	Signature of Head of Institute		Date
	A copy of the application has been sent to					

TO BE FILLED IN BY THE FOUNDATION

Application for research period No. 1 2 3 4

Progress report(s) submitted:

First grant approved: Early/Late 19. . . .

Project started:

Total project support to date: SwCr

Travel grant(s):

First application registered under No.

search
ject

Summary of progress during the previous research period

Publications of research results

Work plan for this research period

Budget	Equipment	Estimated costs	Requested from the Foundation
		\$	\$
	Subtotal	\$	\$
	Expendable supplies (items which individually cost less than US\$ 100, or have a useful life of less than one year)	Estimated costs	Requested from the Foundation
		\$	\$
Subtotal	\$	\$	
Literature, subscription for journals, and similar expenses	Estimated costs	Requested from the Foundation	
	\$	\$	
Subtotal	\$	\$	
Travel, Destination and means of travel. (Long-distance travel subsidized only in exceptional cases. Separate motivation requested)	Estimated costs	Requested from the Foundation	
	\$	\$	
Subtotal	\$	\$	
Staff salaries (subsidized only in exceptional cases. Separate motivation requested).	Estimated costs	Requested from the Foundation	
	\$	\$	
Subtotal	\$	\$	
Other costs			
Subtotal	\$	\$	

APPENDIX TO RENEWAL APPLICATION

PROJECT EXPENDITURES FOR THE RESEARCH PERIOD

..... 19.... — 19....

IFS GRANT AGREEMENT No:

GRANT: US\$

Specification	Project expenditures US \$
Equipment:
Expendable supplies:
Literature:
Staff salaries:
Other major items: (please specify)
.....
.....
.....
.....
.....
.....
Total grant expenditures	US \$

.....
Principal investigator

.....
For the Institute

*international foundation for science * IFS*

EVALUATION OF IFS RENEWAL RESEARCH GRANT APPLICATION

ADVISER:

PROJECT No:

NAME:

COUNTRY:

PROJECT

Reported progress	Little	Satisfactory	Good
Proposed workplan	Questionable	Appropriate	Good
Relation to IFS programme	Questionable	Fair	Strong
Scientific value of a successful result	Little	Modest	Good
Foreseeable use of a successful result	Little	Modest	Good

BUDGET

Overestimated	Appropriate	Under-estimated
---------------	-------------	-----------------

Suggested alterations:

GENERAL COMMENTS

☐ Please check here if you would like to establish direct contact with the applicant, if the project is approved for continued IFS support.

CONCLUSION

Project category: NOT RECOMMENDED 3 2 1

P T O for explanation

EXPLANATION TO FINAL CONCLUSION

- CATEGORY 1 Project of good research quality, either of scientific interest or with prospects of practical use, and relevant to national or international problems. Project well in line with the IFS research priorities. Capable researcher for the task in question. Valuable part of scientific development in the country or region. ("This should or must be done".)
- CATEGORY 2 Project of reasonable research quality and promise, but of less importance compared to Category 1 projects. ("This could be done".)
- CATEGORY 3 Project of limited research interest and promise. ("This might be done".)
- NOT RECOMMENDED Project of little scientific interest and without prospects of practical application. ("This need not be done".)

*International foundation for science * IFS*

RESEARCH GRANT AGREEMENT No. _____

Date: _____

(1) Grant: Swedish Kronor (Skr)

(2) Chief Investigator:

(3) Project:

(4) Administering Institute:

(5) Plan and Particular Conditions for the Grant:

With reference to the items numbered (1) to (5) above,

the International Foundation for Science ("the Foundation"), acting under its Statutes,

and the Chief Investigator (2), having submitted to the Foundation an application registered as IFS Application No. _____,

and the Administering Institute (4), endorsing the Application and supporting the Chief Investigator,

agree to their joint interest in supporting the Project (3).

For this purpose the Foundation will engage itself in the Project for a period commencing on _____ 19__ and extending through one year, in particular by a Grant (1) of Skr _____, subject to the Plan and Particular Conditions for the Grant (5) above and to the availability of funds and to the General Conditions otherwise stated on this page and overleaf.

For the Foundation: _____ Date: _____

I accept the Grant and undertake to carry out the research project according to the Plan and Particular Conditions for the Grant (5), to submit reports, and to abide by the Conditions expressed on this page and overleaf.

Chief Investigator (2): _____ Date: _____

We undertake to administer the Grant (1) for uses solely within the Project (3) and in accordance with the Conditions of this Research Grant Agreement.

For the Administering
Institute (4): _____ Date: _____

General Conditions

Responsibilities of the Chief Investigator

The Chief Investigator agrees that the Grant provided by the Foundation under this Research Grant Agreement shall be used solely for the Project.

The Chief Investigator's undertakings under this Agreement are not transferrable to another person without the consent in writing of the Foundation.

The Programme of the research shall be as defined in the Chief Investigator's application and in Item 5 of this Agreement. The programme may only be changed or the period of the Agreement extended after the written consent of the Foundation.

Responsibilities of the Foundation

When the Foundation has received a signed copy of this Agreement, the Grant is at the Chief Investigator's disposal.

The Foundation has the right to withdraw any remaining part of the Grant, if it is not used by the Chief Investigator within the period of the Agreement, if the Agreement is annulled or otherwise changed, or if other circumstances prevent the fulfillment of the Agreement.

Responsibilities of the Administering Institute

The Institute undertakes to administer the Grant for uses solely within the Project and to provide the facilities necessary for the research work, such as laboratories, salaries, etc., not provided by the Foundation but vital for the Project.

Instruments, other equipment and unexpended supplies received for the Project will become the property of the Institute after the period of the Agreement.

If the Chief Investigator moves to another Institute while this Agreement is in force, and his project can be continued at the new Institute, then equipment and unexpended supplies received for the project should normally be transferred to the new Institute. A new Agreement must be signed between the Foundation, the Chief Investigator and the new Administering Institute.

Reports and Renewal Applications

The IFS grant is given for one research period, normally one year. Renewal of the grant should be sought on separate forms which can be obtained from the IFS Secretariat. The renewal grant application must be accompanied by a Progress Report and a statement of expenditures.

When the project is brought to its conclusion a Final Report with a statement of expenditures must be submitted to the Foundation no later than six months after the expiration of the last project period.

Reports must be submitted either in English or French.

5. Research results

Results from the Project, including any inventions, patents or discoveries shall not belong to the Foundation.

The Chief Investigator shall keep the Foundation informed about any possible applications of the research results.

The Chief Investigator and the Administering Institute may publish all results of the Project, with an appropriate acknowledgement of the contribution from the Foundation.

One copy of the publication should be submitted to the Foundation.

The Foundation is entitled to use in its publications all material submitted by the Chief Investigator or the Administering Institute.

6. Liability for Death, Injury and Damage

The Foundation shall not be liable for the death or the injury or damage to any person or property arising out of the conduct of the Project. The Chief Investigator and the Administering Institute should jointly and severally agree to hold the Foundation immune from any damages arising out of the conduct of the Project.

7. Swedish Law to Govern

This Agreement is made in three copies, one for the Foundation, one for the Chief Investigator and one for the Administering Institute, and whether signed in Sweden or in any other country it should be construed and enforced in accordance with the laws of Sweden.

8. Settling of Differences

Any dispute or any difference between the Parties to this Agreement relating to its interpretation or application shall be referred for mediation to the Professor of International Law at the University of Stockholm, Sweden or to the Person he appoints for this purpose. Any of the Parties is entitled to refer a matter to such mediation, and the mediator shall be competent to act on the basis of a request made unilaterally by one of the Parties.

-00000-

November 1979

*International foundation for science * IFS*

RESEARCH GRANT AGREEMENT No.

It is a great pleasure for me to inform you that the International Foundation for Science has approved your IFS research grant application No. , and decided to make a grant of Swedish Kronor (Skr) (approx. USD) available for your project.

Three copies of the research grant agreement No. are enclosed. Please check the specifications of the grant budget (Item 5), and inform us if there is reason to make any amendments, and fill in the date when the project period begins. Check that all three agreement forms are filled in and signed by yourself and the administering authority before sending them back to the Foundation. When signed on behalf of the Foundation, two copies of the agreement will be returned, one to be kept by you and the other by the administering body.

When the agreement is signed by all parties, the grant will be released. Please let us know if you want the grant transferred to your Institute or if you want the grant, or part of it, to be deposited at a bank account in Stockholm. If you want to have money transferred to your Institute for you, please confer with your Bursar about the administration of your grant. In order to make the transfer quick and safe, we must know the name and address of the bank as well as the account number of your Institute.

For further information about the grant administration and other assistance provided by the Foundation, please study carefully the enclosed "GUIDELINES FOR IFS GRANTEES".

Cont'd

Address
Sibyllegatan 47
S-114 42 Stockholm

Telephone
08-22 07 60

Telegram
IVACADEMI

Telex
17172

Following the evaluation of your application by our Scientific Advisers, some comments (cited below) of importance for your continued work have been made:

In your correspondence with the Foundation, matters concerning the scientific aspects of your project should be directed to me, while administrative matters will be handled by Ms Birgit BODEN and Ms Inger HAETTNER. It would facilitate our routines if reference is made to your grant number in your letters.

Finally, I would like to wish you the very best of luck with your research work. Do not hesitate to contact us if we can do anything to help you to succeed in your work.

Yours sincerely,

Jacques Gaillard
Project Secretary

Encl.- Three copies of agreement
Guidelines for IFS Grantees
Renewal application form
List of IFS Member Organizations
Who is Who at the IFS Secretariat
A Brief Description
IFS project descriptions (sent under separate cover)

A N N E X _ _ _ 3

LIST OF THE IFS
NATIONAL MEMBER ORGANIZATIONS
AS OF 1981

Member Organizations

Argentina	Academia Nacional de Ciencias Exactas, Físicas y Naturales
—	Consejo Nacional de Investigaciones Científicas y Técnicas
Australia	Australian Academy of Science
Belgium	Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique
—	Koninklijke Academie voor Wetenschappen, Letteren en Schone Kunsten van België
Brazil	Conselho Nacional de Desenvolvimento Científico e Tecnológico
Cameroon	Délégation Générale à la Recherche Scientifique et Technique - DGRST
Canada	The Royal Society of Canada
Chile	Academia de Ciencias
Colombia	Fondo Colombiano de Investigaciones Científicas - COLCIENCIAS
Congo	Direction Générale de la Recherche Scientifique
Costa Rica	Consejo Nacional de Investigaciones Científicas y Tecnológicas
Denmark	Det Kongelige Danske Videnskabernes Selskab
Egypt	Academy of Scientific Research and Technology
Ethiopia	Ethiopian Science and Technology Commission
Finland	Suomen Tiedekatemiain Valtuuskunta
France	Office de la Recherche Scientifique et Technique Outre-Mer - ORSTOM
Germany, Fed. Rep. of	Deutsche Forschungsgemeinschaft
Ghana	Council for Scientific and Industrial Research
Guyana	National Science Research Council
India	Indian National Science Academy
Indonesia	Lembaga Ilmu Pengetahuan Indonesia
Iran	University of Tehran
Israel	The Israel Academy of Sciences and Humanities
Ivory Coast	Association Scientifique de Côte d'Ivoire
Jamaica	Scientific Research Council
Japan	Japanese National Liaison Committee for IFS
Jordan	Royal Scientific Society
—	Yarmouk University
Kenya	Kenya National Academy for Advancement of Arts and Sciences
Korea, Rep. of	National Academy of Sciences
Kuwait	Kuwait Institute for Scientific Research
Liberia	University of Liberia
Malawi	National Research Council
Malaysia	Malaysian Scientific Association
—	National Council for Scientific Research and Development
Mexico	Consejo Nacional de Ciencia y Tecnología - CONACYT
Nepal	National Council for Science and Technology
Netherlands	Koninklijke Nederlandse Akademie van Wetenschappen
Niger	Université de Niamey
Nigeria	National Science and Technology Development Agency
Norway	Det Norske Videnskaps-Akademi
Pakistan	National Science Council
Panama	Universidad de Panamá
Papua New Guinea	The University of Papua New Guinea
Peru	Consejo Nacional de Ciencia y Tecnología - CONCYTEC
Philippines	Science Foundation of the Philippines
Senegal	Secrétariat d'Etat à la Recherche Scientifique et Technique
Seychelles	National Research and Development Council
Somalia	Somali Academy of Sciences and Arts
Sri Lanka	National Science Council of Sri Lanka
Sudan	The National Council for Research
Sweden	Ingenjörsvetenskapsakademien
—	Kungliga Vetenskapsakademien
—	Kungliga Skogs- och Lantbruksakademien
Switzerland	Swiss National Science Foundation
Tanzania	Tanzania National Scientific Research Council
Thailand	National Research Council
Tunisia	Direction de la Recherche Scientifique et Technique
Uganda	National Research Council
United Kingdom	The Royal Society
U.S.A.	American Academy of Arts and Sciences
—	National Academy of Sciences
Venezuela	Consejo Nacional de Investigaciones Científicas y Tecnológicas
Zambia	National Council for Scientific Research

A N N E X _ _ _ 4

IFS SECRETARIAT STAFF MEMBERS

IFS SECRETARIAT STAFF MEMBERS

Hans SARAP, Swedish
Director

INTERNATIONAL RELATIONS AND ADMINISTRATION

Ingrid MILLOVIST, Swedish
International Secretary

Birgit SVENSSON, Swedish

SCIENTIFIC PROGRAMME AND GRANTS

Jacques GAILLARD, French
Project Secretary

Lennart PRAGE, Swedish
Project Secretary

Klaus FLEISCHMANN, German

Eva ANDERSSON, Swedish
Project Assistant

Birgit BODEN, Swedish
Project Assistant

Inger HAETTNER, Swedish
Project Assistant

SCIENTIFIC PROGRAMME AND GRANTS

Maria OLSSON, French
Project Assistant

Ingrid SCHOLANDER, Swedish
Information Secretary

Judith FURBERG, American

Annex 5

Remarks on Field Work by the Evaluation Panel Members

The panel members decided at their first meeting in June 1982 to conduct interviews in the field with IFS grantees, representatives of the host institutes of the grantees, and authorities from National Member Organizations. In addition, it was decided that one member of the panel would conduct interviews with representatives of the sponsor institutions, and the members of the Sponsor's Committee in particular. In this way, the panel would have direct information on the operations and impact of IFS.

All the field work was done between June and October 1982. Dr. Pisit visited Indonesia, Sri Lanka and Thailand, and prepared a report for the panel based on his interviews; Dr. Thiongane visited Camerun, Togo, Ghana and Upper Volta, and prepared a report on his interviews, as well as a summary of issues that is attached in this annex; Dr. Sagasti covered Costa Rica, the Dominican Republic and Peru, focussing mostly on interviews with authorities from National Member Organizations; and Dr. Oldham visited sponsors and attended a meeting of the Sponsor's Committee. Dr. Sagasti and Dr. Oldham did not prepare a separate report on their visits and their views and findings have been integrated into the evaluation report.

Summary of Dr. Thiongane's Field Trip Report
for the IFS Evaluation Panel

A la suite de la réunion du Panel pour l'évaluation de la Fondation Internationale pour la Science FIS/IFS, tenue du 2 au 5 Juin 1982 à STOCKHOLM, la mission qui nous a été assignée était de visiter les pays africains suivants selon un calendrier laissé à notre discrétion :

- Caméroun : Du 25 au 30 Juin 1982
- Togo : Du 30 Juin au 4 Juillet 1982
- Ghana : Du 4 au 4 Juillet 1982
- Haute-Volta : Du 8 au 10 Juillet 1982.

.A remarquer qu'après renseignements sur l'absence de l'unique boursier IFS du Mali, la visite de la Haute-Volta a été programmée à la place de celle de la République du Mali.

En dépit de quelques difficultés d'organisation rencontrées sur le terrain, notamment en matière de rendez-vous en plus des aléas de contre-temps vécus au cours des voyages, on peut affirmer que l'essentiel de la mission a été réalisée.

En effet, d'une façon générale, des personnalités hautement représentatives des organisations nationales ont été interviewées (Caméroun, Ghana, Haute-Volta, Sénégal) sinon la plupart des Directeurs d'Instituts ou leurs adjoints.

Aucun doyen de faculté n'a pu être contacté à cause entre autres de la période des examens de fin d'année.

Quant aux bénéficiaires, certains étaient absents de leur pays pour des raisons diverses, mais un bon nombre était partit en année sabbatique à l'étranger.

Malgré les problèmes ainsi évoqués, il a été répondu aux différentes questions soulevées dans le cadre de l'évaluation. Il est à noter qu'en dehors du Caméroun, aucun des pays visités n'a fourni à notre connaissance, de réponses au questionnaire IFS du Pr. OLDHAM - certains disent ne les avoir pas reçus, d'autres font allusion au problème de langue.

S'agissant de l'évaluation proprement dite, nous livrons ci-dessous les principales conclusions de notre étude :

.../

A/ Au niveau des organisations nationales

I) Pour les demandeurs et leur sélection

- La non maîtrise de l'approbation et de la transmission des demandes de bourses IFS a été évoquée au Camérout et au Ghana.

Cette lacune s'explique par la multiplicité des contacts individuels directs avec les futurs bénéficiaires, tant à l'étranger qu'au niveau même des pays.

Cependant il s'avère par ailleurs que ces contacts sont très utiles, car ils favorisent la connaissance par les scientifiques des possibilités d'offres de bourses de recherche I.F.S.

- Les organisations devraient cependant cerner de plus près les procédures de sélection des candidats ainsi que celles de la transmission des dossiers à la Fondation. Cela permettrait de mieux suivre les boursiers IFS et leurs projets.

- Le vœux a été émis de voir s'accroître le nombre de bourses IFS accordées aux pays visités.

- Un pays a exprimé le désir de recevoir aussi régulièrement que possible, les rapports et autres documents instructifs édités par I.F.S.

B/ Au niveau des Institutions

I. Organisation de la Recherche

Les Institutions nationales de recherches sont rattachées à un département ministériel (Ministère, Secrétariat d'Etat ou Délégation). Ce dernier pouvant être soit celui de l'Enseignement Supérieur (Sénégal - Haute-Volta) soit le Premier Ministère (Camérout) soit un autre Ministère (Développement Rural, Industrie, Science et Technologie etc...).

Dans tous les cas, la recherche menée dans les Universités n'a pas toujours les meilleures liaisons avec les structures de recherche appliquée relevant des Ministères du Développement.

C'est là une situation qui mérite réflexion.

A noter que même au sein d'un Ministère ayant vocation de Développement rural par exemple, les liaisons entre les structures de recherche et celles de vulgarisation ou d'encadrement rural sont le plus souvent insignifiantes.

Dans certains cas, on constate un éparpillement étonnant des structures de recherche ayant même vocation, avec des cloisonnement qui empêchent toute coordination ou harmonisation des actions de recherche.

La relation entre ces contextes spécifiques aux pays que voilà et la contribution de la Fondation au développement des capacités scientifiques des pays ne semble pas évidente à priori. Cependant, il a été constaté que certains boursiers s'ignoraient complètement, et parfois, l'organisation nationale chargée des bourses IFS, ne détient par devers elle, aucune information sur les bénéficiaires nationaux. Ces lacunes compromettent naturellement l'efficacité de toute coordination entre boursiers IFS et Institutions nationales et bénéficiaires.

2. Politique de recherche - Rôle de l'IFS

En général, les programmes de recherche des pays sont proposés de concert entre les structures de recherche et celles du développement. Ces programmes portent sur les domaines des productions végétales (céréales, tubercules, fruitières, horticulture etc...) animales (viande de ruminants domestiques, lait, volailles etc...) halieutiques (poissons, crustacés, céphalopodes etc...) forestières (essences exotiques ou autochtones, bois d'oeuvre ou de champ etc...).

D'autres thèmes concernent le milieu physique (agropédologie, milieu marin, foresterie, pâturage etc...). Certains sont relatifs aux plantes médicinales, à l'hydrobiologie (pêche continentale).

Parmi les programmes qui recueillent le moins d'attrait et d'intérêt devant les Commissions ad hoc de sélection des programmes prioritaires, figurent ceux sur les systèmes techniques de production, le transfert de techniques en milieu rural, la sociologie et l'économie rurales.

S'agissant des programmes de caractère régional ou sous-régional, certains portent sur les céréales (mil, sorgho, maïs, niébé) par exemple les pays du sahel dans le cadre du Comité inter-Etats de Lutte contre la Sécheresse (CILSS), les Etats de l'Ouest-africain, Organisation de l'Unité Africaine (O.U.A.) - Semi-arid research for le Développement en Afrique (à vérifier) (SAFGRAD).

Cependant presque tous ces derniers programmes sont exécutés soit au sein des structures nationales de recherche par des chercheurs nationaux, (Sénégal, Haute-Volta, Mali, Niger etc...) soit dans des stations ou centres internationaux (IITA).

En outre, le volet formation et spécialisation des futurs chercheurs n'est pas en reste. C'est au demeurant dans ce cadre que s'inscrit un bon nombre de bourses IFS dont les bénéficiaires préparent des thèses de troisième cycle ou de ~~Ph.D.~~ de MSc ou diplôme d'études approfondies.

C'est pourquoi, les Institutions nationales se sont montrées très intéressées par la contribution de la Fondation à la formation, sur le terrain, de leurs jeunes chercheurs.

a) La politique générale de la Recherche scientifique dans les pays visités est essentiellement axée sur :

- L'autosuffisance alimentaire pour les populations (cultures vivrières, fruitières et légumineuses - Productions animales - Les productions halieutiques : pêche maritime et continentale).
- Cultures de rente (café, cacao, banane, coton, arachide etc...).
- Les productions forestières

.../

- Les énergies nouvelles et renouvelables
- Les plantes médicinales dans la pharmacopée africaine
- Les problèmes socio-économiques face aux innovations et à la technologie intermédiaire ou moderne
- La lutte contre l'aridité et la sécheresse.

Ces différents domaines constituent parmi d'autres, les thèmes prioritaires des plans de recherche et de développement desdits pays.

b) Pour la réalisation des programmes et la maintenance des structures de recherche, les ressources financières émanent essentiellement des budgets nationaux (entre 60 et 90 % environ). Cependant, la part consacrée directement au fonctionnement des programmes de recherche est très moyenne, car les charges de personnel ajoutées aux frais de maintenance des centres et stations de recherche représentent facilement les 70 à 80 % du budget global de recherche.

La contribution de la Fondation a une faible incidence sur les financements nationaux des pays visités : De l'ordre de 0,3 à 0,5 % pour 1980/1982.

c) S'agissant du degré de popularité de la Fondation dans les pays visités, il est faible au niveau des organisations nationales dans trois pays sur cinq. Cependant IFS est mieux connu dans les Instituts nationaux et certaines universités du fait de l'impact du financement des projets IFS sur l'ambiance scientifique et le rôle joué par les boursiers (travaux de recherche, publication etc...).

Il conviendrait pour mieux faire connaître la Fondation aussi bien aux organisations et institutions nationales compétentes, qu'aux chercheurs et bénéficiaires potentiels, de diffuser davantage de documents IFS aux niveaux des instances précitées, notamment des rapports périodiques d'activités.

En outre, les missions d'appui aux jeunes chercheurs bénéficiaires devraient être multipliées dans la mesure du possible. Enfin l'utilisation du canal des organisations régionales de recherche mériterait d'être essayé.

d) Parmi les domaines d'extension des projets IFS possibles figurent :

- Les systèmes techniques de productions végétales, animale forestières et agricoles.
- La socio-économie rurale - les énergies renouvelables - la biotechnologie etc...

e) En ce qui concerne la prise en charge du salaire du boursier IFS, par la Fondation, l'opinion prédominante des personnes interviewées, est qu'il n'est pas réaliste de le faire car en cas d'arrêt du don, la relève pour le paiement du salaire n'est pas toujours garantie.

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3. Informations sur les bénéficiaires

- a) La majorité des personnes interviewées semble opter pour la promotion du jeune chercheur par le biais du don IFS. Cette promotion pouvant se concrétiser soit par une thèse de doctorat (PhD ou 3ème cycle) soit par des publications de portée internationale, portant sur des travaux de recherche prioritaires.

- b) Les critères de choix

Le jeune âge, le mérite scientifique du boursier et sa capacité de très bien conduire un projet de recherche IFS. Il convient d'ajouter cependant les probabilités de stabilité du boursier dans le pays d'exécution du projet, à moins qu'il ne s'agisse d'un projet de type régional.

D'aucuns estiment en outre que les critères de choix des boursiers doivent aussi être rapprochés des niveaux de priorités attribués aux sujets IFS en fonction des besoins du développement économique et social des pays.

4. Procédures d'obtention de la bourse IFS

a) L'information ne circule généralement pas de façon satisfaisante dans le sens Fondation, Organisations nationales membres, Instituts et Universités, chercheurs et réciproquement.

Les principales cibles devraient être simultanément les organisations nationales, les Instituts et Universités. La Fondation devrait éviter la distribution individuelle incontrôlable des formulaires de demande de bourse IFS.

Cela éviterait des flottements et du retard entre les candidats potentiels, leurs Instituts d'origine et les Organisations membres.

b) Les bourses IFS procurent plus de confiance aux jeunes chercheurs bénéficiaires. Ces derniers s'épanouissent plus facilement grâce aux moyens matériels spécifiques mis à leur disposition. Leurs travaux, en se déroulant au sein des structures nationales de recherche, exercent des effets induits sur les autres opérations de recherche des pays. Cela contribue positivement à l'amélioration de la qualité de l'ambiance scientifique.

c) L'ouverture d'un compte IFS individuel au niveau de Stockholm pourrait se justifier dans la mesure où des commandes de matériel d'équipement seraient payées directement par IFS aux fournisseurs européens ou américains par exemple. Et cela si tant est que ledit compte fût jugé nécessaire à la Fondation.

Les fonds des projets IFS devraient être virés aux Instituts des pays bénéficiaires au prorata des chercheurs en fonds de roulement. Le reste pourrait servir à l'acquisition directe de matériel produits chimiques etc... Cette procédure permet de contourner les difficultés administratives existant dans certains pays en matière de marchés d'ordre administratif, les risques de taxation douanier qui greverait très lourdement le montant de la bourse et enfin le problème non moins délicat du transfert de devises et celui de la convertibilité de la monnaie d'origine en monnaie locale.

5. Impact des dons IFS

- a) Pas d'effet de prestige selon les personnes rencontrées.
- b) Ambiance scientifique = cf point 4. b)
- c) L'estimation des dons IFS par rapport au coût de la carrière du chercheur bénéficiaire n'a pas été explicite. Cependant, les boursiers sont convaincus de passer le plus clair de leur carrière généralement sinon la totalité, sauf incident, dans la carrière de chercheur.
- d) Demandes potentielles de bourses IFS.

Les demandes potentielles pourraient couvrir très largement les offres potentielles de bourses IFS, si seulement la publicité requise était pour une meilleure connaissance de la Fondation était faite dans les pays africains. Une nette ignorance de la Fondation était perçue en ce qui concerne les Départements, facultés, les Universités des pays visités. Le Ghana et le Camérout semblent avoir bien compris cette lacune dès le départ. Ils servent d'exemple sur ce plan là.

- Les Instituts pourraient aider la Fondation en intensifiant la sélection de leur ressort des candidatures auprès des Centres et Stations de recherche.

Les dossiers de candidatures devraient, après leur présélection dans les Instituts, l'utilisation des médiats pourrait être un grand concours, ainsi que les réunions de coordination et d'information ayant lieu dans les organisations, les Ministères de la Recherche et les Universités.

- e) Types de dons IFS et réajustement

Il n'y a pas eu de position tranchée entre un grand nombre de bourses individuelles IFS avec des montants faibles et un nombre de bourses plus réduit mais avec des enveloppes financières plus substantielles.

Cependant, certains penchent plutôt pour la seconde hypothèse. D'autres estiment que la moyenne entre 10 000 et 12 000 \$ US réajustée selon les taux d'inflation dans les pays bénéficiaires, serait raisonnable. C'est aussi notre avis.

C/ Des chercheurs bénéficiaires de bourses IFS

I. Identité

-En dehors de deux chercheurs interviewés au Ghana, dont les âges tournent autour de la cinquantaine, toutes les autres personnes rencontrées devraient être âgées de 30 à 42 ans environ.

-Leur niveau de formation se situe entre le MSC ou le diplôme d'études approfondies (DEA) et le PhD ou le Doctorat de 3ème cycle.

-Tous les chercheurs sont localisés dans leur pays d'origine sauf un seul.

-Une seule dame a été interviewée tout au long de la mission

.../

2. Problèmes relatifs aux demandeurs

a) La principale filière d'information sur les possibilités d'obtenir une bourse IFS aura été celle des experts en mission connaissant ou travaillant à la Fondation dans les pays. Parfois l'information est saisie opportunément par les jeunes scientifiques, à l'occasion des stages qu'ils effectuent à l'étranger (IITA, GERDAT, ORSTOM, IRSA etc...).

- b) Pas rencontré de difficultés pour le remplissage des formulaires.

- c) Utilisation des fonds - Transfert des crédits entre la Fondation et les pays bénéficiaires

-Un cas d'utilisation imprécise est signalée dans un pays, à cause de changement de poste,

-Un autre cas a vu geler les fonds dans l'une des banques du pays bénéficiaire du fait de l'absence prolongée du bénéficiaire de son poste de travail.

Il effectuait une année sabbatique dans la région.

-L'utilisation des fonds s'est faite dans les règles de l'art comptable, selon les bénéficiaires et leurs autorités de tutelle.

-Le transfert des crédits IFS présente quelque fois des difficultés du fait de certaines traditions monétaires.

-L'acquisition de certains équipements avec règlement direct des factures entre la Fondation et les fournisseurs étrangers.

-Le principe du compte séparé mais contrôlé et mouvementé par la Direction de l'Institut au projet du bénéficiaire semble emporter l'adhésion de la plupart des interviewés. Les pièces justificatives doivent être exigées.

- d) Renouvellement de la bourse et Planification des projets

-Certains ont senti passer la transmission entre la première tranche et la suivante. D'autres très peu. Afin d'éviter pareils aléas, le principe de la planification du financement des projets sur 3 à 4 ans a souvent été proposé par les interviewés.

- e) Différences dans les dons IFS

Les dons de moins de 7 à 8 000 \$ US n'ont pas semblé satisfaire leur acqureur. Des difficultés de fonctionnement de leurs projets sont signalées par les boursiers.

3. Procédures de sélection des boursiers IFS

Les chercheurs interrogés pensent généralement que les critères de sélection dominants devraient être le jeune âge, le mérite et la capacité scientifique de conduire valablement un programme IFS.

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-Les choix sont faits à partir des curriculum vitae, diplômes, notation, etc...

Les jury de sélection sont parfois composés de chercheurs et/ou Enseignants Séniors, doyens de facultés et membres d'organisations nationales, Directeurs d'Institut de Recherches etc...

4. Suivi des projets et des boursiers IFS

L'un des principaux voeux des bénéficiaires est de pouvoir être encadrés par les chercheurs d'expérience qui viendraient le plus régulièrement possible en mission d'appui dans les pays. Cela viendrait compléter l'assistance non moins importante des chercheurs Séniors nationaux.

-Un autre souhait est la tenue plus fréquente de séminaires-ateliers régionaux ou sous-régionaux voire internationaux, où se concerteraient des chercheurs travaillant sur les mêmes thèmes ou des thèmes complémentaires.

-Les uns et les autres pensent beaucoup de bien de la Fondation.

5. Impacts

-Sur les bénéficiaires eux-mêmes, l'impact s'est traduit sur certains par l'élévation de leur niveau de spécialisation grâce à la préparation et soutenance de thèse de doctorat. Pour d'autres, ce sont des publications scientifiques de haut niveau, ayant une portée nationale et internationale.

-Autres impacts = L'impulsion donnée par le don aux actions de recherche qui deviennent très rapidement opérationnelles.

-Amorce et effet d'entraînement d'autres sources de financement pour d'autres programmes.

-Rôle combien déterminant de l'équipement scientifique des laboratoires où évoluent les boursiers IFS et par extension l'intérêt qui en découle pour les autres chercheurs y travaillant en équipe ou isolément.

-Impact des résultats acquis sur le développement des pays - exemple : la sélection et la maîtrise de l'élevage de la crevette *Macrobrachium Vollenhoveni* au Ghana. "L'inoculation bactérienne de l'arachide et du soja au Sénégal" aura été un sujet très pratique dont l'application est déjà positive.

L'impact sur l'ambiance scientifique se matérialise par l'utilisation de tous les effets induits par le projet et son bénéficiaire sur ses collègues et les Etudiants éventuels.

Impact sur le pays : Possibilité de faire effectuer par les nationaux, des travaux de nature prioritaire dont l'application peut induire des plus-values sur l'économie nationale.

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6. Perspectives d'avenir

-Les chercheurs interrogés pensent poursuivre leur carrière scientifique le plus longtemps possible.

-Ils ne sont pas contre l'enseignement de communautés scientifiques d'un pays développé notamment IFS pour une meilleure coopération scientifique internationale.

Cependant, cela suppose, sur le terrain, entre chercheurs, des thèmes et programmes de recherche-développement.-

Annex 6

Scientific Associates during 1981

Aquaculture

G B AYLES	Canada
T E CHUA	Malaysia
A CROSNIER	France
B I DYBERN	Sweden
R D GUERRERO	Philippines
E A HUISMAN	Netherlands
H-J LANGHOLZ	Fed. Rep. of Germany
L LAUBIER	France
K T MACKAY	Canada
P MENASVETA	Thailand
L NAGEL	Fed. Rep. of Germany
O A ROELS	USA
Z H SHEHADEH	Philippines
P SORGELOOS	Belgium
K TIEWS	Fed. Rep. of Germany

Animal Production

E BRÄNNÄNG	Sweden/Zambia
C DEVENDRA	Malaysia
P HORST	Fed. Rep. of Germany
P G KNUTSSON	Sweden
R A LENG	Australia
T R PRESTON	Dominican Republic/Venezuela
F SUNDSTØL	Norway

Vegetables

R H BOOTH	Peru
A H BUNTING	United Kingdom
K CAESAR	Fed. Rep. of Germany
D G COURSEY	United Kingdom
Y DEMARLY	France
Y DORMERGUES	Senegal
C DUMONT	France
U GRANHALL	Sweden
H S MANN	India
B NESTEL	United Kingdom
P NOZERAN	France
B N OKIGBO	Nigeria
J PERNES	France
A R PERSSON	Norway

G	RANGASWAMI	India
E R	TERRY	Nigeria
P	TYLES	United Kingdom
A	VON SCHOONHOVEN	Colombia
J	WILSON	USA
L A	WILSON	Trinidad

Mycorrhiza

G D	BOWEN	Australia
F	LE TACON	France
G	LUNDEBERG	Sweden
D H	MARX	USA
P	MIKOLA	Finland
B	MOSSE	United Kingdom

Fermentation

H	GYLLENBERG	Finland
C-G	HEDEN	Sweden
B	VON HOFSTEN	Sweden
W R	STANTON	Malaysia

Natural Products

J	CANNON	Australia
A	KJAER	Denmark
T	NORIN	Sweden
P	POTIER	France
F	SANDBERG	Sweden
L C	VINING	Canada

Rural Technology

C J	RIBBING	Sweden
B	KJELLSTROM	Sweden

EVALUATION OF THE INTERNATIONAL FOUNDATION FOR SCIENCE

IDENTIFICATION

Project

Title: International Foundation for Science
Country: Global
Number: not reported
Division: Fellowship Program

Evaluation

Evaluators: Segasti, F. (non-Centre)
Oldham, G. (non-Centre)
Voraauri, P. (non-Centre)
Thiongane, P. (non-Centre)
DAP: 3-A-81-4194
Initiator: Sponsoring Committee of IFS
Type: mid-term
Term: Feb. 1982 - April 1983
Centre Budget: Evaluation: \$96,042 (1%) total of which
\$22,810 from the Centre. (3%)
Project: approx. \$6,250,000 of which
\$710,00 from the Centre

EVALUATION RATIONALE

"The IFS faced no immediate problems or difficulties, but, after 8 years of operation the members of the Sponsors' Committee considered that an independent review of the Foundation's operation would provide useful information to help in charting the future course of evolution for the IFS." That is, the donor agencies with the concurrence of the IFS prompted the evaluation.

EVALUATION OBJECTIVES

From the report: "... (to) review the performance of the IFS and (to) make suggestions for the future". From the DAP, "two main items to be studied are: the granting process of IFS and the impact of IFS support on institutions in developing countries. Other issues to be studied and assessed are the balance between work to select grantees and staff follow-up, administrative procedures and scientific advice to grantees and institutions".

Critique

The implied objectives are nebulous. Surprisingly, a concise statement of objectives could not be found anywhere. This is a significant oversight/deficiency. The content of the report gives some insight as to what was desired but no judgements can be made as to whether or not expectations were achieved. Effectiveness and efficiency issues are paramount.

EVALUATION SUMMARY AND CONCLUSIONS

Description

1. The effectiveness of IFS has been a consequence of several laudible operational characteristics:
 - o IFS should maintain its niche and focus exclusively on small personal grants that help young LDC scientists in their transition from graduate work towards active members of the scientific community.
 - o IFS should not support the application of research results on a large scale or commercial basis. Exploitation of research results should remain the responsibility of host country institutions.
 - o IFS should maintain its multilateral donor character. Sponsors must continue to provide contributions without conditions. The possibility of counterpart funding by local host country agencies should be explored.
 - o IFS grants should remain below \$US 10,000 with the salary of researchers excluded and with a maximum of three renewals.
 - o The present range of services provided to grantees (equipment purchases, supply of expendables) should be maintained. Providing literature, bibliographic assistance and sponsoring regional workshops should be expanded.
 - o IFS should consider providing support for servicing and repairing scientific equipment.
 - o In the short-term the disciplinary focus of IFS should be maintained. In the future, expansion into closely related fields particularly in complementary social sciences should be considered.
2. IFS has achieved its objectives and fulfilled its role rather well. The general opinion is that IFS is useful, flexible, responsive and efficient.
3. The structure and operational style are well suited to fulfilling IFS objectives and make it a highly regarded organization. Although the flexible and non-bureaucratic style should be maintained there is a need to clarify lines of authority for decision making and responsibilities for various sub-groups within IFS. The present system of processing grants appears to be too demanding and time-consuming. The Presidency should be more active in external relations and especially in building an international constituency, thereby allowing the Director to concentrate his efforts on management of IFS. The number of Scientific Advisors should be doubled in order to identify new grantees, and should increase the participation of LDC and non-Scandinavian advisors. The number of Project Secretaries should also be expanded. The Sponsors' Committee should collaborate fully with the President to raise additional funds for IFS.
4. Generally, the granting process has functioned

efficiently. Yet advisors should be appointed for 3 years from a roster of candidates submitted by National Member Organizations, the Sponsors and the Director. The criteria for appointment should include scientific excellence and commitment to IFS^o objectives and style of work. Advisors should help to identify potential grantees, evaluate grant applications and guide grantees in the field. Advisors who identify a grantee should not evaluate the proposal. The present pluralistic method under which grantees are identified should be maintained and expanded. New ways to isolate grantees should be considered. Regional allocations of grants should not be considered. A procedure to speed up the granting process is provided which eliminates the need for numerous meetings. Guidelines should be prepared to help potential grantees prepare better proposals. Criteria on which grantees are selected should be made more explicit and should be more widely disseminated. Rejection letter should clearly state reasons.

5. The IFS grants should retain their basic structure and size. However, the size of the grants should be kept constant in real terms. It is preferable to have a larger number of relatively small grants than fewer larger ones. The number of grants should be increased by twofold. The ratio of two applications for each grant approved should be maintained. The practice of seconding Project Secretaries by national aid agencies should be further encouraged. The dispersal of IFS funds to grants, administration and grant related services should be maintained. The possibility of grouping grants around a problem area covering various interrelated topics and extending over more than one scientific area should be explored. Support should be given to study the impact of modern technology and science.
6. IFS grantees have for the most part been young scientists to whom the IFS was originally established to help. This has led to some criticism that the work supported by IFS has been of mediocre quality. IFS grants should continue to be given to individuals and not to projects. Greater effort should be made to follow-up and monitor grantees. Advisors should play a major role in linking grantees to the international scientific community--possibly IFS should publish an periodical newsletter for the IFS community. Regional workshops should also be expanded.
7. National Member Organizations are only periferally involved with IFS. More research councils from developed countries should be included. MDC National Member Organizations should more actively nominate Advisors, should help develop a constituency of support for IFS activities among the scientific community. LDC National Member Organizations should play a greater role in disseminating information about IFS to

potential grantees. The IFS and the potential grantee should keep the host institution fully informed of major events in the lifetime of a grant; IFS should continue to solicit opinions from host institutions for grant renewals; IFS should continually request host institutions to give suggestions on the IFS program; host institutions should be put on mailing lists for any newsletters which may be published by IFS.

Critique

1. Although the DAP indicated that the evaluation would study the "impact of IFS support on institutions in Developing Countries" very little impact assessment was done. In fact, the evaluation team implied that this was not its mandate.
2. Instead, the report is a summary of policies, procedures, and, primarily, quantitative outcomes. It only superficially addresses impact and doesn't discuss the validity of the programme to any meaningful extent.

EVALUATION METHODOLOGY

Description

The research tools were:

1. File/desk searches
2. Interviews
3. Questionnaires

A structured research design was not presented.

Critique

1. No indicators of success/achievement were given at the beginning and hence no judgements can be made as to the significance of the conclusions.
2. No research tools were presented and should have been. Data from the mail surveys and the interview reports were only partly presented. A more appropriate design seems necessary.
3. For the amount of time and money which was allocated, a more qualitative assessment should have been expected.

PROGRAMMING/POLICY IMPLICATIONS

For the Centre

1. The role of the Centre is supported.

For the Division

For OPE

1. Evaluation is a research project and should be treated as such with clearly defined objectives, a methodology plan and, even possibly, hypotheses which might be tested.
2. The report suffers from an excess amount of verbiage and would clearly benefit from having an Executive Summary. Some of the appendices are also gratuitous.