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S U P P O R T

OTHER FUNDS AND PROGRAMMES

UNITED NATIONS FINANCING SYSTEM FOR SCIENCE AND TECHNOLOGY  
FOR DEVELOPMENT

Report of the Administrator

Summary

This report describes the operations of the United Nations Financing System for Science and Technology for Development (FSSTD) for the period March 1984 to March 1985. A section on operational activities describes the salient characteristics of FSSTD's approach to overall programming and to assuring the quality of project design and implementation. New project development initiatives and co-operative arrangements with Governments and non-governmental organizations are described, including emergence of trust funds as an important source of new project funding. The status of intergovernmental negotiations on the long-term institutional and financial arrangements for the Financing System is also summarized. Annex I presents a statement of the financial resources and commitments of FSSTD through 31 December 1984.

Summaries of ongoing and completed projects giving project results and achievements and follow-up activities, where appropriate, are provided in annex II.

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## INTRODUCTION

1. The period under review, March 1984 to March 1985, continued to be one of uncertainty regarding the long-term financial and institutional arrangements under which the United Nations Financing System for Science and Technology for Development (FSSTD) would operate. This uncertainty has undoubtedly hindered the mobilization of resources through normal pledging procedures. (The total amount contributed in this manner was under \$250,000 in 1984.) Nevertheless, a number of new projects and programming activities were initiated with funds provided directly by Governments and from other income. A summary of project activities and results is provided in section I below and in annex II to the report.

2. Also covered are follow-up activities on projects assisted by the Financing System, including second phase project development, follow-up investments and technical meetings designed to disseminate useful information gained from project activities, particularly among developing countries. A number of independent project evaluations have been completed during this period and these are also available to interested Governments and others. These activities are characteristic of a programme that has reached a certain stage of maturity, i.e., a sufficient number of projects have been completed so that results can be identified and assessed and further action taken.

3. New initiatives covering special programming efforts in Africa carried out in co-operation with the Economic Commission for Africa (ECA) and the African Regional Centre for Technology (ARCT) and involving representatives of recipient and donor Governments, as well as interested private sector organizations, are dealt with in section II. Project development activities continued in 1984-1985 as FSSTD prepared itself for a new operational orientation in which fewer traditional grant resources are becoming available and consequently greater flexibility and imagination are called for in carrying out a multilateral assistance programme for science and technology.

4. As Governments continue to explore ways and means to establish the Financing System on a viable long-range basis, there has been an increasing emphasis on co-operative arrangements with Governments, non-governmental and private organizations involving both financial and non-financial resources. For example, during this period the Financing System's operations were based to a larger extent on non-core resources, and new project commitments were almost exclusively funded with resources provided in this way. The significance of this method in financing FSSTD project operations is examined.

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5. Intergovernmental negotiations on the long-term institutional and financial arrangements for FSSTD were again the focus of decisions by both the Intergovernmental Committee on Science and Technology for Development and the General Assembly. The objectives of an Intergovernmental Working Group to consider ways and means of putting the Financing System on a viable long-term basis are contained in section III below. Results of the Working Group's deliberations will be made available to the Governing Council at its thirty-second session.

#### I. OPERATIONAL ACTIVITIES, 1984

##### A. Highlights of project operations

6. The following text and tables summarize, for the period under review, the tangible aspects of the Financing System's contribution to the improvement of scientific and technological capacities in developing countries and the consequent enhancement of their abilities to apply these powerful tools to the achievement of overall development objectives. Despite the uncertainty regarding its future and the severe financial constraints resulting in part from this uncertainty, FSSTD has, nevertheless, continued to carry out an extensive programme of operations. The record shows that since the beginning of its operations in 1980:

(a) Innovation and flexibility have continued to characterize FSSTD's operational style and functioning. This is well illustrated in the way in which new project activities have been funded since 1983. In the absence of any substantial inflow of new core resources through the traditional pledging conference, FSSTD has succeeded in attracting over \$20 million for project funding through such non-core mechanisms as cost sharing and trust funds. Beyond this, co-operative arrangements have been set up with Governments and non-governmental organizations (including those in developing countries) whereby non-financial resources have been mobilized and allocated to science and technology capacity-building activities in developing countries;

(b) An input of approximately \$57 million\* FSSTD has resulted in 100 projects designed to improve the basic technical and scientific infrastructure research and development (R and D) facilities policy machinery and human resources in over 90 developing countries. Developing countries themselves have contributed more than \$100 million of their own resources to these efforts;

(c) FSSTD has helped developing countries to strengthen their ability to deal with complex issues in the choice, adaptation and assimilation of technologies suited to their own national priorities. This objective has been pursued both through the establishment of such new institutional mechanisms as science and technology ministries and research centres and through upgrading academic training and curricula;

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\*This includes approximately \$12.5 million in trust fund projects already committed but not yet under implementation.

(d) Through the global Technical Information Pilot System (TIPS) and the Andean Technological Information System (SAIT), the Financing System has supported activities to increase developing countries' access to science and technology information available in the industrial world and within developing countries themselves;

(e) Nearly 1,800 men and women from developing countries have received advanced technical training through the FSSTD fellowship programme, and dozens of academic and training institutes have been initiated or have helped to grow and modernize with support from the Financing System;

(f) In all of its project activities, the underlying principle has been to strengthen domestic innovative capacities and to promote the diffusion of R and D results through the testing and commercialization of products for both domestic and external markets. In several cases, project results are already being shared with other developing countries;

(g) The "project concept" approach developed by FSSTD has helped to reduce processing time to an average of about six months, resulting in substantial savings in terms of both time and costs. Improved project quality has been achieved through the preparation of a detailed work plan by the project management, which has served as the basic blueprint for monitoring and evaluating the project;

(h) A high proportion of government-executed projects has also been a notable feature: approximately 50 per cent of all projects financed by FSSTD has been executed directly by the developing countries. This, in itself, has been an important contribution to strengthening internal capabilities in this field, but has required careful monitoring by FSSTD;

(i) Resources have not been allocated to countries on the basis of a pre-arranged formula. Each project has been developed and approved on individual merit through a rigorous appraisal process. Also to be noted are the low administrative overhead costs associated with FSSTD-financed projects. These costs have ranged from 8 to 10 per cent, which compares very favorably with other programmes in the United Nations system.

7. In 1984, intensified co-operation with headquarters units and field offices of the United Nations Development Programme (UNDP) enabled FSSTD to bring to bear a broad range of technical expertise to its own project operations which are primarily designed to build up endogenous science and technology capacities in developing countries. At the same time, it has served to introduce a science and technology dimension into the country programming process and has fostered joint action with specialized operations in the Sudano-Sahelian region and in the new and renewable energy sector. Similarly, closer day-to-day working relations with the UNDP Division for Global and Interregional Projects and with the Centre for Science and Technology for Development have enhanced the programming and evaluation undertakings of the Financing System.

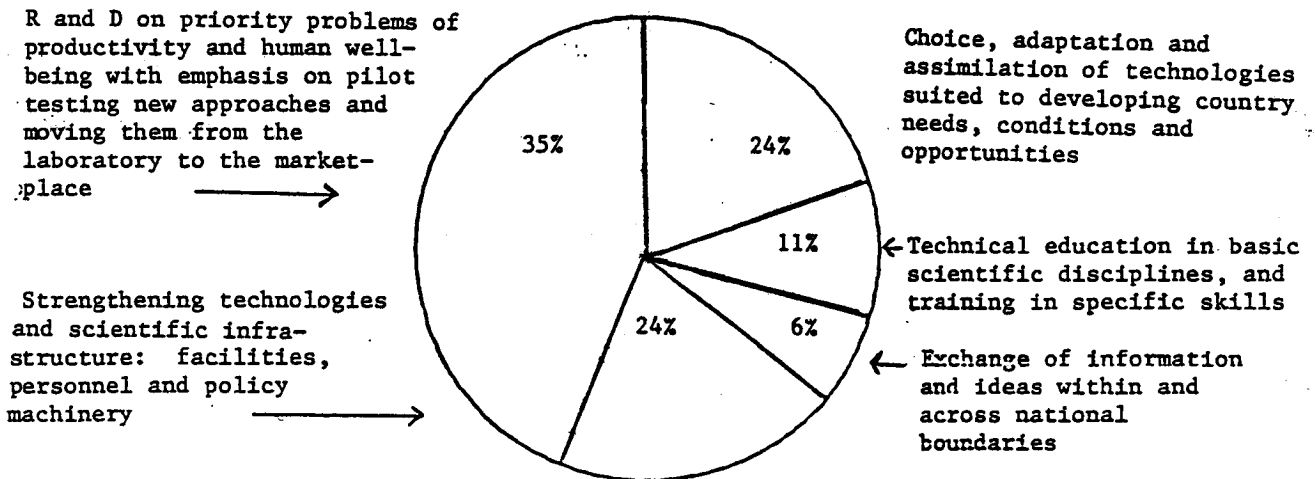
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8. Finally, it should be noted that the overall financial situation of FSSTD was strengthened by overhead allocations from a number of new trust-fund projects. When taken together with balances from the previous period and other earnings in 1984, the combined amount is sufficient to meet FSSTD's administrative costs through 1985. Annex I provides a breakdown of the Financing System's overall resources and commitments as at 31 December 1984.

B. Summary of project activities

9. The chart below depicts the allocations of FSSTD funds by major programme areas. It is based largely on the eight programme areas set out in the Vienna Programme of Action on Science and Technology for Development; it also reflects the fact that many projects incorporate the objectives of more than one programme area. It graphically illustrates the relative emphasis that Governments have given to different types of science and technology activities supported by FSSTD

Allocation of funds by programme area



Note: Most FSSTD-supported projects also serve to improve the use of existing scientific resources by helping to promote their co-ordinated application.

10. Although these percentages are based on a limited number of examples (i.e., the 91 projects approved by the Financing System through 1984), they nevertheless give an indication of how FSSTD has responded to the priorities developing countries have given to various aspects of their science and technology needs and interests. These percentages might well vary if the Financing System had been in a position to provide financial assistance to a larger number of project proposals. (The approved projects represent less than 10 per cent of the proposals submitted for financing by developing countries.) The number of projects financed through trust funds is still far too small to warrant a separate comparison with the percentages in the chart above. It is interesting to speculate, however, on how the type of financial resources available might affect the operational activities of the Financing System.

11. A reflection of the geographic distribution of requests for assistance from the Financing System, together with the allocation of approved projects, is presented in table 1 below. Table 2 provides a breakdown of project expenditures by major cost component.

Table 1. Distribution of requests and approved UNFSSTD projects by region, 1980-1984

<u>Region</u>	<u>Total requests</u>		<u>Total approved requests</u>			
	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Amount</u> (US dollars)	<u>%</u>
Africa	292	30	32	35	12 768 426	28
Asia	231	23	21	23	15 045 899 <sup>a/</sup>	33
Latin America	180	18	20	22	9 951 062	22
Arab States	106	11	11	12	4 388 160	10
Interregional	126	13	7	8	3 285 094	7
Europe	54	5	-	-	-	-
<b>Total</b>	<u>989</u> <sup>b/</sup>	<u>100</u>	<u>91</u> <sup>b/</sup>	<u>100</u>	<u>45 438 641</u>	<u>100</u>

<sup>a/</sup> Includes two major trust-fund projects with a value of \$3.5 million.

<sup>b/</sup> Of the total 989 requests for the period 1980-1984, only 91 or about 9 per cent have been approved, which includes 17 projects financed by means of special trust funds, special purpose contribution and cost sharing. By the end of 1985, nine more projects (totalling \$12,370,000 financed by special trust funds) are expected to be approved.



Table 2. UNFSSTD project expenditures by major cost component, 1980-1984

Region	Project personnel	%	Sub-contract	%	Training	%	Equipment	%	Misc.	%	Sub-total	Support costs	%	Project total
Africa	4 974 402	39.0	820 904	6.4	1 752 221	13.7	3 608 330	28.3	679 419	5.3	11 835 276	933 150	7.3	12 768 426
Asia	2 902 165	19.3	1 762 078	11.7	1 990 522	13.2	6 521 985	43.3	566 668	3.8	13 743 418	1 302 481	8.7	15 045 899
Latin America	3 785 235	38.0	658 739	6.6	1 161 137	11.7	3 158 225	31.8	488 677	4.9	9 252 013	699 049	7.0	9 951 062
Arab States	977 236	22.3	-	-	581 747	13.3	2 366 849	53.9	273 188	6.2	4 199 020	189 140	4.3	4 388 160
Interregional	1 047 155	31.9	1 059 927	32.3	723 052	22.0	32 000	0.9	105 929	3.2	2 968 063	317 031	9.7	3 285 094
TOTAL	13 686 193	30.1	4 301 648 <sup>a/</sup>	9.5	6 208 679 <sup>a/</sup>	13.7	15 687 389	34.5	2 113 881 <sup>b/</sup>	4.6	41 997 790	3 440 851	7.6	45 438 641

<sup>a/</sup>The sub-contract component includes provisions for training (estimated to be at around 50 per cent of total sub-contract). This would increase the total training component to around 18 per cent.

<sup>b/</sup>This includes provision for the "internationalization of project results" as well as for evaluation.

C. Follow-up activities: Phase II projects

12. Most completed FSSTD-supported projects require follow-up activities. In some cases, the originally approved proposals were viewed as first phases and a follow-up was foreseen by design. In other cases, the project results have identified the need for investment follow-up and concrete recommendations and proposals for that purpose have been made.

13. As many of the projects initially funded by FSSTD in 1980 and 1981 are being concluded, follow-up activities have arisen in connexion with certain projects. These activities have included second phase undertakings where the host Government decided it was worthwhile and financing could be arranged for investment activities either by the Government or in a joint venture with non-governmental sources.

14. The second phase of the regional technical assistance project for non-destructive testing, in which 15 Latin American and Caribbean countries are now participating, is being financed from a trust fund. In Haiti, the necessary follow-up of the project on promotion of artisanal fishery will be financed from the UNDP indicative planning figure (IPF). In some cases, donor consultations are being undertaken with a view to raising additional funds.

15. INTERACT is an innovative computer-training and software development programme in India aimed at the development and transfer of know-how in system engineering of real-time, on-line, computer-based systems dedicated to applications in power distribution management, railway freight management and meteorological early warning systems. In order to utilize more effectively the developed know-how, a phase II project is being considered to intensify work in the power and railway sectors, investigating the needs of developing countries for comparable computer applications in such new sectors as agriculture, education and health and continuing to provide training in a technical co-operation among developing countries (TCDC) context in basic computer applications.

16. A proposed phase II project in the Philippines, under which pilot plant production of the identified by-products of the sugar industry would be undertaken in order to improve the economic and technical feasibility of large-scale domestic production of these chemicals, is under consideration. The potential for annual foreign exchange savings is estimated to be on the order of \$30-45 million. The project emphasizes the principle embodied in research and development efforts supported by UNFSSTD, namely that such programmes should establish clear links to industrial production in order to maximize the economic impact of useful results.

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17. The completion of a number of projects in Africa has resulted in an immediate need for adequate follow-up to ensure that the results achieved are indeed fully utilized and disseminated. Some of these projects require expanded support for pre-investment activities and, in some cases, funds for investment follow-up. In all, about nine phase II projects in Africa now require support.

18. In Mauritius the assessment of wind energy strongly suggests the need for a demonstration project to set up a wind-powered generating device of about 15 to 20 KV capacity. In Lesotho a second energy project has successfully tested a variety of solar and bio-gas devices in different situations; the task is to undertake now a comprehensive programme of technology diffusion in both rural and urban areas.

19. In 1983, a number of small-scale projects were approved with the intention of initiating project activities and setting up the basis for a more substantial main phase. Projects in Kenya (the science and technology information and documentation system) and in Guinea-Bissau (creating a geo-technical capacity) now require urgent follow-up for which phase II documents have been prepared. In Mozambique, a preparatory assistance project was undertaken to work out the detailed parameters for the setting up of a semi-industrial metallurgical laboratory. The sub-contract award for this purpose has been completed and the programme now awaits financing of the main phase, which is estimated to cost approximately \$1.4 million. A related metallurgical project is being completed in Nigeria, where the first phase costing \$1.6 million established a basic Nigeria capability to conduct research and development work in metallurgy. The investment follow-up effort is estimated at \$11.6 million. This follow-up project is currently being negotiated with the Government of Nigeria for implementation through the Financing System on a cost-sharing basis.

20. Other projects include support to the African Regional Centre for Technology (ARCT) in the areas of biomass and post-harvest food losses. ARCT, founded in 1980, in one of the main African institutes mandated to strengthen the technical capabilities of the countries of the region. Another project is a technology transfer venture in the United Republic of Tanzania to upgrade fishing techniques. The useful results of this project now need to be more widely disseminated to the fishermen in Zanzibar in Pemba.

D. Training in science and technology

21. In establishing the Financing System, Governments stipulated that its primary purpose was the strengthening of endogenous scientific and technological capacities; the other purpose was the promotion of South-South and North-South co-operative arrangements. Following this mandate, the Financing System has helped to support a variety of projects in the human resources field. For instance, upgrading science education in Ethiopia, Kenya, Swaziland and Zambia; higher level technical training in Paraguay and Peru; setting up an institute of fundamental studies in Sri Lanka; and supporting specific training courses organized by the Trieste International Institute for Theoretical Physics and conducted in developing countries themselves. As a result of this effort, a large number of science and technology-oriented personnel have been trained and, in at least one country, the very first science students graduated from a FSSTD-supported university programme last year.
22. Approximately 18 per cent of FSSTD's overall expenditures are directly applied to training and additional amounts are incurred for on-the-job, in-service training through the interaction of consultants with national counterparts. In addition, every FSSTD project has a component for the internationalization of project results, wherein training seminars and publications help to disseminate the output of one project to practitioners in other countries.
23. As the accompanying tables 3 and 4 show, nearly 1800 fellows have been trained under FSSTD-supported projects, particularly in cross-sectoral problems of science policy and planning, technology choice, research management and information system. The largest number of fellows are from Asia, followed by Latin America and Africa.
24. It is interesting to note that 86 per cent of these training fellowships were undertaken in the developing countries themselves. All trainees have attended programmes of over one week's duration. An additional and perhaps even greater number of participants attended numerous technical meetings and symposia, organized through national or intercountry projects.
25. The concentration of programmes in particular areas of fundamental importance for developing countries is also of interest. One major area of concentration is the field of natural resources, which shows the growing interest of developing countries in achieving self-reliance by increasing and improving the use of national resources and reducing their dependence on external factors. Similar importance is given to education programmes, providing training in the basic sciences as well as all other technical related fields.

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26. Directly linked to these two fields is the promotion and management of science and technology, which also shows a high concentration. This is a tool that brings the development process a step further. In fact, developing countries are not only strengthening their capacities to make use of indigenous resources and to improve their technical knowledge in various fields, but they are also acquiring the necessary tools to manage such expertise and to plan for its utilization.

27. Finally, it is important to note the considerable number of programmes in the industrial field. This trend seems to indicate that emphasis is not only on the theoretical side of science and technology development, but efforts are also undertaken to forge the necessary links with the productive sectors.

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Table 3. Fields of training

	Documentation and information	Science and technology education	New And renewable energy	Industry	Micro- electronics	Utilization of natural resources	Science and technology Promotion management	Acquisition of technology	Total
Africa	22	45	7	2	-	9	205	34	324
Arab States	4	1	-	-	-	18	36	37	96
Asia	22	68	56	22	152	407	85	42	854
Latin America	15	258	1	198		1	36	8	517
Total	63	3/2	64	222	152	435	362	121	1791

Table 4. Origin and placement of trainees

Trainees from	Total	Trained in institutions in <u>developing</u> countries	%	Trained in institutions in <u>develoned</u> countries	%
Africa	324	272	83.9	52	16.1
Arab States	96	63	65.6	33	34.4
Asia	854	746	87.3	108	12.7
Latin America	517	459	88.8	58	11.2
Total	1 791	1 540	86.0	251	14.0

E. Evaluation Programme

28. After finalization of the appropriate evaluation methodology and procedures, evaluation has become an important management tool in the general context of programme management and the assurance of project quality. Evaluation, as conceived by FSSTD, is an independent review by outside experts of ongoing or completed projects. It is a different exercise from input for project monitoring and follow-up. After termination of the evaluation process, a tripartite project review normally takes place in order to directly assess the evaluation results. This might lead to a decision either to redirect or redesign the project or to draw appropriate lessons for follow-up activities (for example, the formulation of a second phase).

29. By the end of 1984, the following seven projects had been evaluated by UNFSSTD:

- (a) China - National Remote Sensing Centre;
- (b) Costa Rica - Support to National Science and Technology Planning and infrastructure;
- (c) Dominican Republic - Strengthening of the National Planning Capacity for Science and Technology;
- (d) Jordan - Building Materials Research Centre;
- (e) Nigeria - Central Metallurgical Research and Development Institute;
- (f) Philippines - Industrial Chemistry from Indigenous Carbohydrate Raw Materials;
- (g) Andean subregion - Programme for the Progressive Establishment of the Andean Technological Information System.

30. The results of the seven completed evaluations allow some general conclusions regarding project design, execution and monitoring. As far as the design is concerned, the evaluations have clearly confirmed the experience that the original design of a project should normally not go beyond the function of a blueprint for the general project strategy, leaving enough freedom for changes and amendments which can be reflected in the workplan and its amendments during the lifetime of the project.

31. In the case of the science and technology policy and planning projects evaluated, it was found that as work progressed political and institutional factors, which were necessarily built into the design, became more serious obstacles to the realization of expected project results than the designers had originally anticipated. On the other hand, these evaluations confirmed that the clear identification of structural and institutional obstacles was a prerequisite for their removal in order to increase the degree of technological self-reliance of the countries concerned.

32. The evaluations of projects designed for the establishment or strengthening of research institutions have pointed to the need for a reasonable balance between non-revenue and income-generating research projects on the one hand, and between their developmental aspects and their commercial viability and investment prospects on the other hand. It has been found again that these classical managerial problems in capacity building in R and D institutions of developing countries are difficult to overcome.

33. With regard to project implementation, one of the main problems identified was the negative effect of inappropriate managerial chains of command and insufficient management communication and information flows which can slow down considerably a technically sound and commercially promising project. Steering committees have been identified as useful instruments for control of and advice to the project management, but in the case of projects which have to integrate inter-institutional or intercountry conflicts of interest, even this mechanism might not be a guarantee for smooth project management.

34. The positive experiences with government execution in other aspects of project management have been confirmed by the evaluation of projects of this type. The government executing agencies were generally in control of all aspects of project implementation and FSSTD, with the active support of the respective UNDP field offices, was able to provide the necessarily increased backstopping requirements. All evaluators have highlighted the importance of government execution as an instrument for the strengthening of self-reliance and improving managerial capacities of Governments and research institutions.

35. Finally, it was found that the independence of the evaluators vis-à-vis the executing agency and the Financing System is as crucial as an independent co-ordination of the evaluation within FSSTD. Evaluation



of the following projects is being prepared for completion in 1985:

(a) Ethiopia - Development of Communication Tools for the Popularization of Science and Technology;

(b) India - Technological Development and Training Programme for Computer-based Systems;

(c) Jamaica - Upgrading the Scientific and Technological Capabilities of the Jamaica Bauxite Institute;

(d) Malawi - Scientific and Technological Development in the Tea Industry;

(e) Pakistan - Development Centre for Silicon Technology;

(f) Tunisia - Centre for Earth Science and Geological Mapping.

## II. PROJECT DEVELOPMENT ACTIVITIES

36. This section deals with efforts of the Financing System to lay the groundwork for further operational activities in science and technology. The current financial situation is clearly not one in which an automatic and predictable flow of funds could be counted on to support new project commitments. In these circumstances, it was considered both necessary and useful to consider all feasible approaches to alternative sources of project funding. Some of the measures pursued during 1984 are described below.

### A. Project Portfolio

37. By the end of 1984, despite a slowdown in the flow of project requests, the total number of official requests from developing countries exceeded 1,000. As the total requests received far exceeded available resources, a portfolio of 85 projects considered of high potential and ready for immediate implementation is under active review and development by the Financing System.

38. This portfolio represents promising projects which have been endorsed by requesting Governments, appraised through UNFSSTD's established channels and further strengthened by technical inputs of UNDP, the United Nations system organizations concerned and independent experts. A number of similar projects have already been identified by interested donors for financing

through cost-sharing, trust fund contributions and other joint arrangements with FSSTD. The present portfolio is submitted for review by donor Governments and development organizations as an aid to identifying funding opportunities.

39. Since June 1984, UNFSSTD has participated in the UNDP co-ordinated Project Annotated List (PAL) exercise. This initiative represents a systematic approach to match the unmet technical assistance requirements of developing countries with the special resources that developed countries and multilateral financing institutions have available.

#### B. Special purpose initiatives

##### 1. Co-operative links to further science and technology development in Africa

40. The Second High-level Meeting on International Co-operation for African Technological Development took place in Rome from 19 to 23 November 1984, following the first such conference at Dakar, Senegal last year. The Rome meeting continued a new type of dialogue for Africa and sought to respond to the challenge of how best to mobilize systematically the experience of the international technology community to help resolve specific development problems.

41. The Rome Meeting concerned itself with co-operative projects in food and energy and attempted to address the causes of the crisis in Africa rather than its symptoms or consequences. Also addressed was the need to strengthen the abilities of African institutions to avoid such a crisis in the future or to deal with them more effectively if they did occur. The sentiment at the meeting was that it was easier to raise \$100 million after a crisis had occurred, than it was to get \$5 million towards helping to prevent such a crisis. Ministers from Senegal, Kenya and Ethiopia pointed to the inevitability of the next drought-induced crisis, unless and until agriculture related sectors in their countries were equipped with the necessary techniques and tools to deal with sharp declines in rainfall.

42. Four concrete programmes estimated at \$36 million were reviewed and subsequently revised, each designed to link African science and technology institutions with reliable partners from the industrialized world as well as from other developing countries with the appropriate experience and interest

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in Africa's development. The programmes are as follows:

(a) To conduct a major co-operative R and D effort in the packaging and preservation of staple foods and the application of bio-technologies to enhance food production and preservation;

(b) To test, on a pilot scale, an information network linking existing R and D centres and emphasizing the actual exchange and usage of information on food technology and packaging;

(c) To establish a consortium of African and non-African technical consultancy firms dealing with food technologies, agro-industries and energy, commercially competitive but with a major objective of upgrading African technical capacities;

(d) To endow internationally recognized chair(s) of technology with research and scholarship funds in already established African research institutes and/or universities, initially in nutrition and food technology.

43. The recognized task is to followup energetically on the recommendations made by the Rome Meeting and to pursue the key donor institutions which have already expressed their willingness to consider funding the programmes, as well as to implement project activities which can be started almost immediately through the participation of interested institutions. Many institutions have already made offers of facilities and technical expertise to help implement these projects.

2. International seminar on research and dissemination strategies of improved stoves for the Sahelian region

44. The Permanent Inter-State Committee on Drought Control in the Sahel (CILSS) and UNFSSD jointly sponsored an international seminar on research and dissemination strategies of improved stoves for the Sahelian region. The seminar took place in October/November 1984. Based on a comprehensive evaluation by a multi-disciplinary team, this meeting sought to set the basis for effective large-scale diffusion of proven wood stoves in both urban and rural areas. The meeting brought together Sahelian researchers, African policy makers, representatives from non-governmental organizations and funding bodies.

45. The evaluation, in particular, recognized that insufficient attention had been given to the role that markets and small-scale craftsmen/entrepreneurs can play in diffusing innovations. The emphasis was therefore on delivery mechanisms and how to diffuse the broader subject technology in order to best get R and D results commercialized and widely disseminated. In order to make a real impact on the energy crisis in the Sahel, millions (not hundreds) of stoves needed to be distributed.

46. In this connexion, UNFSSTD and CILSS have been entrusted with the task of creating a Woodstove Trust Fund with a committee to review on a periodic basis the implementation of the woodstove programme. Donors will be represented on this committee.

### 3. Special initiatives within the framework of the Lagos Plan of Action

47. The importance of a science and technology policy-planning framework as the basis for integrating science and technology activities in a national programme is even greater in Africa in light of the present emergency situations. In responding to the present African crisis, the Organization of African Unity-executed Lagos Plan of Action project has been reoriented to permit a subregional planning effort by the five subregional groups in priority areas of food self-efficiency and energy. The national and subregional priorities within these two areas will be decided upon by the subregional working groups (northern Africa, central Africa, western Africa, eastern Africa and southern Africa) and capacity-building/strengthening programmes in food and energy will accordingly be formulated for financing. The following initiatives are also included in the Lagos Plan of Action project.

48. Forest eco-system. This is meant to respond to a need felt by the Governments in western and central Africa (i.e. Ivory Coast, Gabon, Congo and Zaire) for a regional perspective to the uncontrolled depletion of forestry resources. Within this perspective, it is intended to work out well-designed programmes responding to the countries' needs which will be based on a more complete understanding of the interrelated social, economic and physical factors in forestry management and utilization.

49. Blueprint for food self-sufficiency. Within the context of other food-related initiatives being pursued in Africa, the effort here, based on a critical assessment of the present African crisis, seeks to present a series of actions to mobilize the vast resources and interest of the global scientific and technological community for the betterment of Africa.

### C. Emergence of trust funds

50. In decision 82/5 of 18 June 1982, the Governing Council authorized the Administrator to accept trust funds conditioned on procurement from a donor country on behalf of the Financing System and other special funds under UNDP management. In decision 84/35 of 29 June 1984, the Council further extended the authority to accept such trust funds until 30 April 1986 and decided that the experimental period should not be extended beyond the date. The

Governing Council will take a final decision regarding the issue of trust funds conditioned on procurement in the donor country at its thirty-third session.

51. Because the core resources of the Financing System have not been substantially replenished over the last few years, trust-fund operations which were originally conceived as only one of several different funding modes, have become an important funding source for FSSTD. The first project financed by FSSTD through the type of trust fund authorized in decision 82/5 was approved in 1983 in the amount of \$1.3 million. An additional five projects valued at \$6.1 million were approved in 1984. Commitments have been received for nine more with an input of \$12.5 million which are expected to become operational in 1985. Taken together, the 15 trust fund projects will represent an amount of around \$20 million.

52. It is evident that the function of the Financing System with regard to programme management and operations is influenced by this modality of resource mobilization. In some cases, the Financing System acts essentially as a broker with a view to matching identified priority projects with available multi-bilateral resources, while still adhering to the mandate of the Vienna Programme of Action and subsequent resolutions of the General Assembly.

53. The guiding principles behind projects financed in this way are the same as those applied in financing projects on more traditional multilateral lines. The priorities of recipient countries are respected and the full UNFSSTD appraisal process is utilized. The donor Government does not interfere with the appraisal process nor in the technological choices of the recipient country. Every project, even though it is subject to procurement in the donor country, provides requisite untied inputs to ensure the international character of technical co-operation. In addition, the required support costs for development and monitoring of such projects are provided by the trust fund itself.

54. This form of multi-bilateral co-operation in science and technology has just begun, on a case-by-case basis. Each project involved the participation of three parties: the recipient country, FSSTD and the donor country. So far the parties involved have expressed satisfaction with this modality.

D. Co-operative arrangements with private  
organizations professional societies and others

55. Co-operative arrangements with non-governmental bodies and private sector organizations, as well as with established governmental agencies, have been actively pursued by FSSTD in order to focus the widest possible range of expertise, resources and experience on the scientific and technological components of programmes in its purview. During 1984-1985 these arrangements included:

(a) Involvement of national and world-wide professional societies in science, engineering and related fields in the ongoing and future work of FSSTD. The technical resources of such groups are vast and arrangements are under way for their utilization on a no-fee basis;

(b) An initiative taken jointly with a leading university's international engineering programme to offer developing country universities and institutions high-quality audio-visual courses based on its graduate level programmes in science and technology;

(c) The involvement of consulting engineering groups of international repute in the Financing System's project design and management activities;

(d) A series of consultations during 1983-1984 with over 200 interested private and corporate enterprises and business groups aimed at defining opportunities for private sector collaboration in promoting science and technology for development;

(e) A significant initiative in regard to new co-operative arrangements is the Financing Systems' efforts to take advantage of in-kind contributions offered by developed and developing countries alike. Under these arrangements substantial expert, training and technical services available in contributing countries are being mobilized as supplementary inputs to ongoing and new projects establishing, in the process, renewed North-South linkages in major sectors.

### III. ACTION BY THE GENERAL ASSEMBLY

56. As called for in resolution 3 (VI) of the Intergovernmental Committee on Science and Technology, a preparatory meeting was convened on 30 and 31 October 1984. At that meeting, Governments were concerned with two main issues;

(a) Indications of individual contributions by Governments to the Financing System for the first year of its long-term operations and, if possible for the two succeeding years;

(b) Appropriate follow-up action, depending on the total resources expected to be available as a result of indications by Governments.

57. At the Preparatory Meeting, it became evident that the aggregate amount likely to be available (\$10 million) was substantially below the envisaged target and that, therefore, an important requirement for launching the Financing System on a long-term basis had not been met. It was agreed at the meeting to consider further steps to be taken.

58. Consequently, the General Assembly adopted decision 39/428 of 17 December 1984 which, inter-alia, established an open-ended intergovernmental working group, which should meet to permit a broad exchange of views on ways and means to facilitate the bringing into effect of the long-term financial and institutional arrangements for UNFSSTD.

59. The Intergovernmental Working Group held at its first meeting on 25 January 1985 and at that meeting a number of Governments expressed their interest in taking a fresh look at ways and means to mobilize adequate resources for the Financing System and exploring new approaches that would achieve this objective. With this in mind, the secretariat was requested to prepare a paper providing various options and adjustments that might be considered in order to assist the Working Group in its task.

60. It was emphasized that the presentation of alternative possibilities should be comprehensive, allowing for an open-minded discussion of all possibilities that could lead to greater resources for the Financing System. It was made clear, however, that the paper should not be prescriptive in nature, but should present approaches that were technically and administratively feasible.

61. A paper along these lines was prepared and the Working Group considered it at its meeting of 11 March 1985 and at subsequent meetings. The results of the Working Group's deliberations on this and related questions had not been developed to a point sufficient for summarizing at the time the present report was being prepared. The outcome of the Working Group's discussions will be made available to the Governing Council at its thirty-second session.

#### NOTES

1/ Report of the United Nations Conference on Science and Technology for Development, Vienna, 20-31 August 1979 (United Nations publication, Sales No. E.79.I.21 and corrigenda), chap. VII.





ANNEX I

STATEMENT OF RESOURCES AND COMMITMENTS

AS AT 31 DECEMBER 1984

(US dollars)

RESOURCES

Adjusted pledges received for 1980-1981 as at 31 December 1981 <u>a/</u>	23 215 173	
Adjusted pledges received in 1982 <u>a/</u>	8 034 416	
Adjusted pledges received in 1983 <u>a/</u>	494 465	
Adjusted pledges received in 1984 <u>a/</u>	350 327	
Adjusted pledges outstanding	2 719 951	
	<hr/>	
TOTAL PLEDGES		34 814 332
Cost sharing/trust funds <u>a/ b/</u>		11 318 392
Trust funds outstanding <u>a/</u>		2 455 600
Other income <u>a/</u>		7 997 125
TOTAL RESOURCES		<hr/> 56 585 449

COMMITMENTS

Operational activities <u>c/</u>	45 130 115	
Programme reserve and others	781 862	
Administrative budget, 1980-1984	7 014 869	
	<hr/>	
TOTAL COMMITMENTS		52 926 846
Balance		3 658 603
Outstanding receivables <u>d/</u>		2 378 552
		<hr/>
BALANCE OF RESOURCES <u>e/</u>		1 280 051
		<hr/> <hr/>

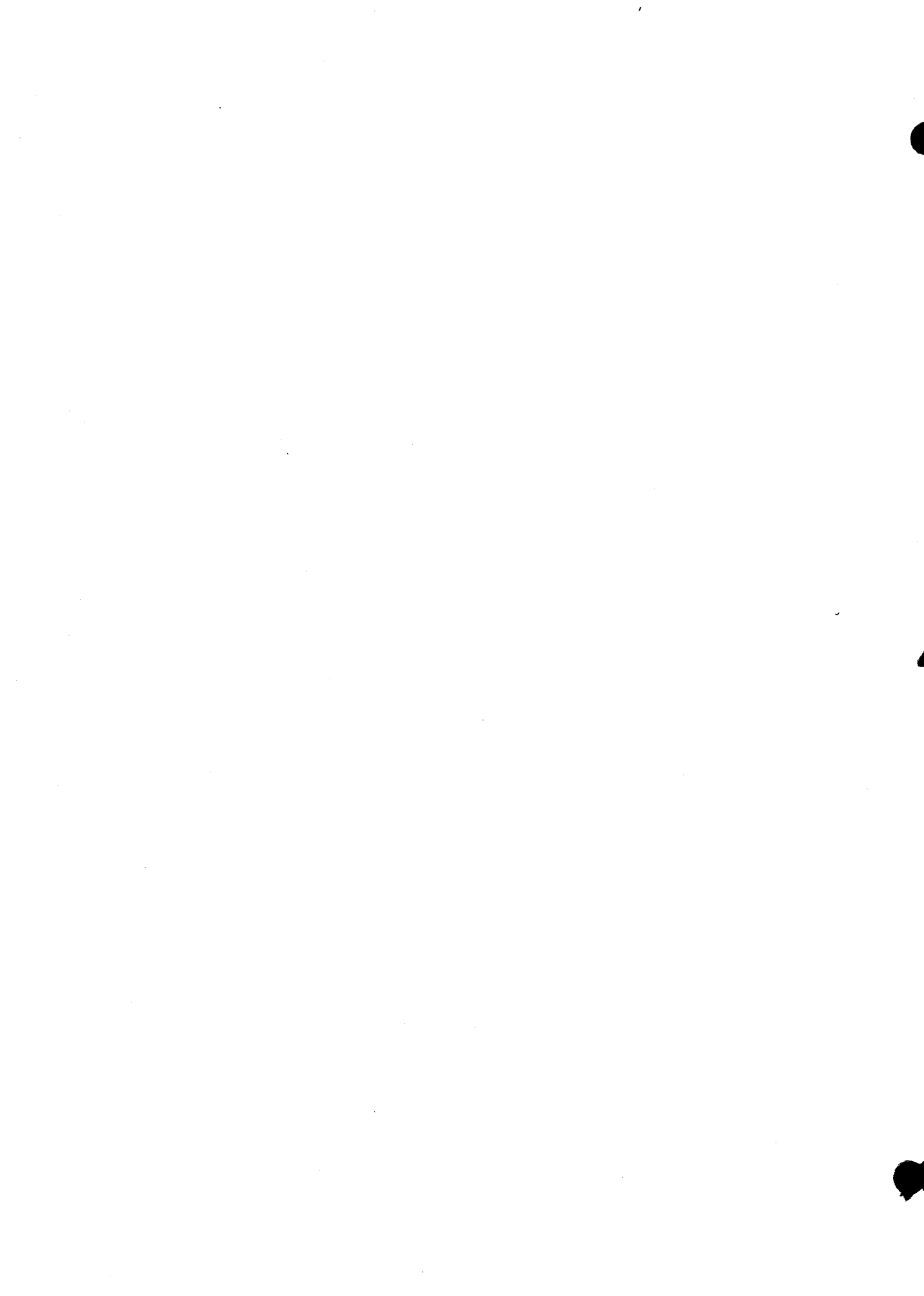
a/ Figures supplied by UNDP/Treasury Section.

b/ Contributions of the Federal Republic of Germany, Italy, Norway, the Organization of Petroleum Exporting Countries (OPEC) and others.

c/ Projects approved to date, including agency support costs.

d/ Unrecovered pledges and non-convertible currencies.

e/ In addition to this balance, additional interest income of \$ US 600,000 is expected to be realized in 1985.



## ANNEX II

## SUMMARY OF PROJECT ACTIVITIES BY PROGRAMME AREAS

1. The main developments in FSSTD-assisted operational projects during 1984 are summarized in this annex. The material is organized under the major programme areas established within the Vienna Programme of Action on Science and Technology for Development, where possible project results and their application in the country and internationally are described.

Programme area I: Science and technology policies and plans for development

2. Projects in the land-locked countries of Botswana, Zimbabwe, Burundi and Lesotho provide good examples of the process of integrating science and technology policies and planning with overall economic and social development. The Botswana project led to an overall assessment of the country's science and technology activities and resulted in the formulation of new science and technology policy guidelines, providing a more efficient apparatus upon which to base crucial science and technology decisions.

3. In Zimbabwe a review of the country's science and technology activities, especially in the chemical industries sector, was undertaken and the results were discussed at a major planning meeting involving other countries of the South African Development Co-ordination Conference. An impressive development resulting from the Lesotho energy project is the establishment of an energy planning policy machinery in the Ministry of Mines that has overall responsibility for co-ordinating new and renewable source of energy in that country.

4. Fiji's scientific and technological policy-making capabilities and related employment opportunity in the productive sector have been strengthened by reassessing existing government policies towards technology imports, adaption and local innovation. The published report resulting from this policy assessment has become an official government policy instrument and is now playing a determining role in formulating decisions on how to avoid job loss, yet mechanize the sugar-cane industry, the country's leading income earner and source of employment. The creation of a new Institute of Fundamental Studies in Sri Lanka with FSSTD assistance helps to address a perennial problem faced by the scientific community in developing countries: how to define and pursue basic research in the essential sciences in a way which impacts on the pressing needs of development.

5. In 1984, two important projects in Costa Rica and the Dominican Republic were completed. Both aimed at the strengthening of the national policy making and planning for science and technology and the insertion of the

science and technology variable into the overall economic and social planning. Independent evaluations conducted on both subjects concluded that awareness of the importance of science and technology in the national planning process has been heightened, the policy instruments improved and the existing infrastructure as well as the co-ordinator within the Government and between government research institutions and the productive sector were strengthened. An important element of creative capacity was built up through the training of a large number of professionals in the Government and in the academic and the productive sectors.

Programme area II: Creation and strengthening of scientific and technological infrastructure

6. FSSTD has financed several projects in this area. These include establishing the Central Metallurgical Centre in Nigeria, and ensuring that the Institute for Agriculture Research in Senegal has a functioning information and documentation capability. Other pertinent projects include the establishment of a geo-technical section within the State Commissariat for National Resources in Guinea-Bissau and assistance to the Centre for Oceanographic Research in Madagascar. These facilities are capable of considerable impact and generate economic opportunities for the respective productive sectors.

7. With the assistance of the Financing System, Tunisia has established a Centre for Earth Sciences and Geological Cartography, equipped with state-of-the-art laboratory facilities and field equipment. Using national expertise to the maximum, the Centre has already trained national scientists and technicians who have succeeded in producing geological maps of internationally accepted quality. The exercise led to the discovery of natural mineral deposits, saving the country much needed hard currency. The results achieved will be shared with specialists from other developed and developing countries at an international seminar scheduled for September 1985.

8. Another example is the project in Yemen. This two-phased undertaking aims at the establishment of an institute of oceanography. Phase I, which is about to start through a grant from the OPEC Fund, will address a selected number of marine-related problems and needs by means of carefully defined pilot activities. It will develop a plan of action for strengthening the capabilities of the country in marine affairs, with emphasis on coastal zone management and ecology.

Programme area III: Acquisition and transfer of technology

9. In Burundi, the Industrial Promotion and Technology Transfer project has enhanced the country's capability to deal with foreign partners, as well as with the broader issue of the contracts and licensing arrangements. After two years of operations, this capability is being tested with the drafting of contracts for technical assistance and equipment as well as helping local entrepreneurs in the legal complexities of joint ventures.

10. The projects in the Gambia, Mauritius, Seychelles and Cape Verde depart from the policy-oriented approach in Burundi in that tested and proven technologies are acquired and then adapted to suit the local environment. The latter class of project deals with small devices to utilize new and renewable sources of energy. Fully adapted and functioning technologies provide more water for villages and agricultural production, more electricity for small isolated villages and more gas for cooking and space heating.

11. Country projects in Nepal and Indonesia, which focus on the selection and design of low-cost prototypes and other small energy-producing devices appropriate to rural areas, have been assisted by FSSTD in order to generate new income opportunities at the village level. The Indonesia project, in particular, has strengthened endogenous capacities and also has adopted an innovative approach to the dissemination of rural technologies through making available a small load facility to individual rural entrepreneurs.

12. In the Lao People's Democratic Republic, more accurate meteorological data for agricultural production and information on the availability of hydrological resources have been made available through the project. In Maldives, with the favourable solar/wind régime, the installation of photovoltaic cells for electricity generation will be undertaken for a detailed feasibility study of solar/wind energy potential for application in specific locations such as community centres, hospitals and selected villages.

13. In addition, high technology efforts have been supported where the technology acquisition process can be effectively completed, thereby deepening the recipient's capacity to absorb and apply that technology in specific circumstances. For instance, FSSTD has assisted in the establishment of the Beijing Institute of Computer Software, which is providing China with the software specialists and computer technology required to meet the urgent needs of accelerated economic development. Research in connexion with this project has developed the Chinese character processing system and several management automation software programmes which have been tested and are now being prepared for delivery to end-users.

Programme area IV: Development of human resources

14. Assistance in developing technical manpower needs in Africa is the subject of several projects. To date, over 500 Africans have been trained through fellowships, on-the-job training and other means. Another 400 have had the opportunity to attend seminars and workshops dealing with state-of-the-art scientific and technical discussions. In Ethiopia an FSSTD-supported project is developing and popularizing science and technology vocabulary in Amharic, the national language. As a result, this project will help to sustain the vitality of a national language as a medium of expression in the rapidly changing scientific world. This has led to considerable interest among African and non-African countries to benefit from this experience.

15. The Rift Valley Institute in Kenya, with FSSTD-assistance, is providing technical manpower needs in rural engineering, farm machinery maintenance, rural water development and rural housing.

16. Another good example in this area is FSSTD's joint project with the Economic Commission for Western Asia which assisted in the formation of a nucleus of qualified technical staff needed in the petroleum-based industries of the Arab States region. The programme involved about 100 professionals and was carried out by means of training workshops and a symposium dealing with assessment and acquisition of technologies. The proceedings of the workshops and the symposium are being published for distribution to member States and interested parties.

17. Projects in India and China illustrate the net benefits which can accrue to a country through high technology acquisition activities based on human resources development. India's project INTERACT offers unique training and research activities within a TCDC context for the development of software design capabilities. More than 130 participants from 22 developing countries, as well as many Indian nationals, attended these training activities in 1983 and 1984. In China, the remote sensing project has trained more than 400 technicians. An international seminar sponsored jointly by FSSTD and the Economic and Social Commission for Asia and the Pacific (ESCAP) is to be held in April 1985 and will disseminate the results of this project to other developing countries.

18. At the end of 1984, four projects were completed which were primarily designed for the development of human resources through training in such fields as an artisanal coastal fishery in Haiti; post-graduate studies and research in the chemistry of natural products in Paraguay; magistral programmes in the areas of mathematics, physics, chemistry, biology and engineering in Peru; and certification of non-destructive testing operators throughout the region. In the case of the regional technical assistance project for non-destructive testing, the financing of a follow-up phase has been secured through the establishment of a trust fund by an interested donor country.

Programme area V: Financing science and technology for development

19. The subject of this programme area should be viewed in both its international and national contexts. FSSTD itself is entirely focussed on the mobilization and channelling of international resources to substantive science and technology projects in developing countries. The word "System" in the Financing System's official designation was intended to signify a flexible financing mechanism capable of attracting resources through a diversity of channels. Taking its authority from General Assembly resolution 37/224 of 20 December 1982, the Financing System has developed innovative procedures and mechanisms which reflect this diversity of approach. Examples include:

(a) Co-financing of projects and programmes together with other bilateral or multilateral financial organizations; this may include, in the case of high-risk projects for example, equity participation in specific projects with host Governments, public or private organizations and other financial organizations;

(b) Multilateral/bilateral co-operation in which the Financing System and individual donor countries combine their efforts; in this case, the Financing System, while handling the multilateral component, is able to provide the development, supervision and monitoring of the bilateral component;

(c) The Financing System has established a small programme reserve (2 per cent of contributions) to give it the flexibility to prepare and initiate action on high-priority topics;

(d) Trust funds established for the receipt of resources from individual donors for specific purposes approved by the Financing System, including funds conditioned on the procurement of donor goods and services;

(e) The Financing System is authorized to support projects by the provision of both grants and loans, although the conditions and arrangements under which loans will be provided have yet to be fully defined by the appropriate intergovernmental machinery.

20. At the national level there have been few requests for FSSTD's assistance in establishing institutional machinery for the mobilization of resources for science and technology. In a number of cases, however, natural follow-up project activities have led to the allocation of further resources including investments both by host Governments and, in some cases, the private sector. One project, in Indonesia, does involve the utilization of existing banking facilities. In a project designed to encourage use of new agricultural techniques in rural areas, a local bank was authorized to make below-market-rate loans to individual farmers utilizing the new techniques.

21. In most cases, however, FSSTD-supported projects to date have not addressed the critical question of policies and programmes for the establishment of institutions or legislation designed to increase the flow of resources to this sector. It is nevertheless clearly within the mandate of the Financing System to respond to proposals along these lines.

Programme area VI: Science and technology information

22. A number of projects have strengthened national information networks. The Kenya project, in addition to setting the initial stages for automated technology information and documentation services for various government ministries to access data, has elaborated a national science and technology information policy suited to the nation's development goals. The Senegal project is establishing modern documentation and information units in approximately 11 agricultural research centres as well as elaborating the methodology for linking these with a central unit. This information network is specifically to service the Senegalese Institute for Agriculture Research.

23. The Financing System has helped the Arab League and its member Governments in establishing a computer-based information system containing bio-data of Arab expatriate professionals. The aim is to facilitate the process of communication between specialized institutions, organizations and government agencies in the Arab world and individual professional Arabs residing elsewhere whose expertise may be of value. The project takes advantage of the low cost of micro-computer and word-processing systems. Thousands of Arab emigrant professionals have been identified and contacted and a good number of them have already expressed an interest in being included in the data-base.

24. The Regional Centre for Technology Transfer is an important component of the emerging regional information network in the ESCAP region.

25. In the case of the Andean Technological Information System, a mid-term evaluation undertaken by FSSTD has produced useful recommendations with a view to strengthening the original design of the project and giving it a stronger user orientation. This is to be achieved through a closer focus on the information market and the strengthening of networks and services which more fully address the needs of the productive sectors.

26. At the interregional level, the Financing System in 1984 was able to define, negotiate and launch the Technological Information Pilot System at the request of a number of developing countries. In two phases, this project will test the technical and economic viability of a user-oriented mechanism for the exchange among developing countries of scientific and technological information on a current basis. The project is not aimed simply at linking data banks, but at promoting the exchange of information of work and



activities in progress between countries on a continuing and timely basis. The focal points of the project will be national bureaux in each of an initial 10 participating countries, linked through a global operational centre. The topics provisionally selected focus on energy and industrial technologies.

Programme area VII: Strengthening of research and development activities in and for developing countries and their linkage to the productive system

27. The projects in the Gambia, Lesotho, Seychelles, Mauritius and Cape Verde carry out research linked to renewable energy technologies. The testing and demonstration work enables national technicians to learn by doing. Although the activities are pilot scale, the results nevertheless are already being utilized in small rural communities. These technologies utilize biogas, solar, wind and mini-hydro schemes. A different but equally interesting research and development project is the Malawi Foundation for Tea Research. The Foundation develops clonal tea varieties that meet the special requirements of small growers. By 1984, nearly 100,000 plants of these newly developed varieties were distributed to the small growers. Field trials indicate that these new varieties may increase yields up to 33 per cent while, at the same time, exhibiting higher quality and greater pest resistance characteristics than standard tea varieties.

28. The project in Jordan resulted in a breakthrough in low-cost housing techniques. For example, with one new technique, newly designed building blocks can be assembled by the homeowner without using mortar. Hundreds of housing units are currently being built in Jordan using the new techniques at substantial savings in cost. Several countries have also shown an interest in acquiring the technology from the Royal Scientific Society of Jordan, the government executing agency of the project. Royalties from this will constitute an important source of revenue for the society.

29. In Papua New Guinea, a research effort for domestic alternatives to costly oil-based energy sources has produced positive results from basic research on the fermentation of ethanol from sago starch. A prototype village starch factory has been set up and an estimated 2 million hectares of sago starch-bearing palm land is foreseen at an agro-industry.

30. In Korea, the establishment of a multi-purpose pilot plant is developing new processes for recycling petro-chemical waste and by-products. This research has already resulted in developing more than eight new processes which have high-potential economic benefits to local industries. For example, one of the major results was the oxidation process for the production of secondary alcohols needed to manufacture laundry detergents.

31. The project in Bangladesh carried out research on indigenous herbal and plant-based drugs. Now through the application of modern pharmaceutical techniques, valuable local resources are being exploited to provide affordable health-care products for the domestic market. Industrial adaptations for commercial sale and export are also being explored.

32. Four pilot plant projects in the Latin American region have neared completion in 1984 and are promising good results and a favourable cost-benefit ratio. In Brazil, pilot plants for the production of carbon fibre and the precursor fibre have been installed in a major research institute and a production plant; local counterpart staff has been trained in their operation and important research results have been achieved. A major petrochemical concern is now taking over the production and marketing of carbon fibres and composites in Brazil with technical assistance from the project-trained research staff. In Honduras, pilot demonstrations have shown the viability of replacing fuel oil by charcoal as an energy source for industrial use. As a result of the project, some major industries are changing their energy supply to charcoal.

33. In Jamaica, a pilot plant for bauxite testing and processing has been completed and local staff fully trained in its operation, strengthening the country's endogenous capacity for the processing of its most important natural resource. In Uruguay, FSSTD-supported research has developed a process for the inactivation of the foot-and-mouth disease virus in meat and meat products without alteration of quality. The process will shortly be tested at pilot-plant scale, bearing ample promise for the reopening of important markets for this primary export commodity of the country.

Programme area VIII; Strengthening co-operation in the field of science and technology among developing countries and between developing and developed countries

34. South-South and North-South co-operation is best demonstrated by the way in which results of projects of mutual interest to other developing and developed countries are internationalized. Examples include the CILSS/FSSTD International Seminar on Research and Dissemination Strategies of Improved Stoves for the Sahelian Countries. The Seminar brought together, inter alia, African decision-makers and Sahelian researchers, providing them the first opportunity for discussion on research results on improved stoves and for evolving a common approach regarding testing methodologies for woodstove distribution.

35. Another meeting with TCDC objectives was the meeting in Rome in November 1984, jointly sponsored by FSSTD and the African Regional Centre for Technology, which brought together high-level African scientists and technologists with their international counterparts to forge co-operative linkages so as to resolve specific development problems. Over 20 African countries and other developing countries (Brazil, China and India) as well as private corporations, the academic community and the United Nations system discussed selected co-operative projects in food and energy.

36. Regional and interregional co-operation with respect to technology development and transfer has been strengthened through the Regional Centre for Technology Transfer, where FSSTD has provided programme support, at Bangalore, India. The Centre is an apex regional institution, which aims at strengthening the endogenous technological capabilities of the developing countries in Asia and the Pacific.

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