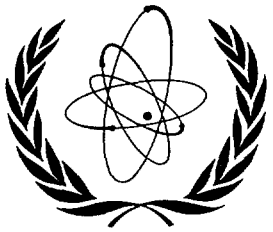


International Atomic Energy Agency

REVIEW OF THE AGENCY'S ACTIVITIES

GC(XI)/362

Printed by the
International Atomic Energy Agency
in Austria - August 1967

CONTENTS

		Paragraphs	Page
I.	INTRODUCTION	1 - 7	5
II.	OBSERVATIONS AND RECOMMENDATIONS	8 - 13	6
III.	RESOURCES FOR TECHNICAL ASSISTANCE AND OTHER FORMS OF DIRECT AID	14 - 17	7
IV.	MANAGEMENT AND ADMINISTRATION OF TECHNICAL ASSISTANCE AND OTHER DIRECT AID PROGRAMMES	18 - 22	8
V.	NUCLEAR POWER AND DESALTING	23 - 31	9
VI.	RADIOISOTOPES AND RADIATION SOURCES	32 - 35	10
VII.	HEALTH, SAFETY AND WASTE MANAGEMENT	36	11
VIII.	RESEARCH AND SERVICES IN THE PHYSICAL SCIENCES	37 - 42	11
IX.	INFORMATION AND TECHNICAL SERVICES (including symposia, conferences and study groups)	43 - 48	12
X.	GENERAL DIRECTION AND ADMINISTRATION OF THE AGENCY	49 - 55	14

ANNEX A VIEWS AND RECOMMENDATIONS OF MEMBER STATES

Bolivia	15
Canada	15
Chile	17
Congo, Democratic Republic of	17
Czechoslovak Socialist Republic	18
Denmark	18
Finland	19
Greece	20
Guatemala	20
India	21
Iran	26
Israel	30
Italy	30
Japan	31
Jordan	32
Korea, Republic of	34
Kuwait	34
Lebanon	35
Madagascar	36
Monaco	37

		Paragraphs	Page
	New Zealand		38
	Nigeria		38
	Norway		38
	Pakistan		39
	Philippines		39
	Romania		40
	South Africa		40
	Sweden		42
	Turkey		43
	Union of Soviet Socialist Republics		44
	United Arab Republic		46
	United Kingdom of Great Britain and Northern Ireland		51
	United States of America		52
	Viet-Nam		53
	Yugoslavia		54
ANNEX B	A PRELIMINARY ANALYSIS OF THE EXTENT TO WHICH THE AGENCY'S ACTIVITIES BENEFIT DEVELOPING COUNTRIES		
PART I.	GENERAL	1 - 42	57
	A. Introduction	1 - 6	57
	B. The Agency's policies and practices governing assistance to the developing countries	7	58
	C. Analysis of help given, by objects of assistance	8 - 9	59
	D. Types and sources of assistance	10 - 31	59
	E. Fields of assistance	32 - 34	63
	F. Financial analysis	35 - 42	63
PART II.	ANALYSIS OF SPECIFIC TECHNICAL PROGRAMMES	43 - 221	67
	A. Technical assistance	46 - 67	67
	B. Nuclear power and reactors	68 - 99	76
	C. Radioisotopes and radiation sources	100 - 150	81
	D. Health, safety and waste management	151 - 164	88
	E. Research and services in physical sciences	165 - 189	91
	F. Information and technical services	190 - 217	95
	G. Special analysis of research contracts	218 - 221	103

			Paragraphs	Page
	APPENDIX	List of states for which a programme under the technical assistance components of UNDP has been approved by the UNDP Governing Council during the period 1967-68		109
ANNEX C	AN INTEGRATION OF THE VIEWS AND RECOMMENDATIONS OF MEMBER STATES (Annex A) AND OF THE PRELIMINARY ANALYSIS OF THE EXTENT TO WHICH THE AGENCY'S ACTIVITIES BENEFIT DEVELOPING COUNTRIES (Annex B)			
	I.	INTRODUCTION	1 - 8	111
		General balance between programmes	5 - 7	111
		Procedures for undertaking the review	8	112
	II.	TECHNICAL ASSISTANCE AND OTHER DIRECT AID (training facilities, including fellowships, expert services and equipment)	9 - 69	112
		Resources	9 - 18	112
		Programme planning and evaluation	19 - 24	113
		Programme emphasis	25 - 26	113
		Distribution of technical assistance by component elements (experts, fellowships and equipment)	27 - 37	114
		Expert services	38 - 42	115
		Fellowships and training	43 - 55	115
		Equipment	56 - 60	117
		Regional projects, particularly centres	61 - 67	117
		Other direct aid	68 - 69	118
	III.	NUCLEAR POWER (including desalting)	70 - 81	118
	IV.	RADIOISOTOPES AND RADIATION SOURCES	82 - 85	119
	V.	HEALTH, SAFETY AND WASTE MANAGEMENT	86 - 90	120
	VI.	RESEARCH AND SERVICES IN THE PHYSICAL SCIENCES, INCLUDING RESEARCH CONTRACTS	91 - 100	120
	VII.	INFORMATION AND TECHNICAL SERVICES (including symposia, conferences and study groups)	101 - 111	122
	VIII.	THE GENERAL DIRECTION AND ADMINISTRATION OF THE AGENCY	112 - 133	123
		Matters relating to the Board and General Conference	112 - 115	123
		Co-ordination	116 - 123	123
		Personnel	124 - 133	124

List of abbreviations

Agency	International Atomic Energy Agency
Board	Board of Governors
ECOSOC	Economic and Social Council of the United Nations
ENEA	European Nuclear Energy Agency (of the Organisation for Economic Co-operation and Development)
FAO	Food and Agriculture Organization of the United Nations
IAEA	International Atomic Energy Agency
IANEC	Inter-American Nuclear Energy Commission of the Organization of American States
IBRD	International Bank for Reconstruction and Development
ICAO	International Civil Aviation Organization
ILO	International Labour Organisation
IMCO	Intergovernmental Maritime Consultative Organization
IPA	Regional Joint Training and Research Programme using a Neutron Crystal Spectrometer between the Agency, India and the Philippines
NORA	Joint Agency-Norwegian Programme of Research with the Zero Power Reactor "NORA"
NPY	Co-operative Programme for Research in Reactor Physics between the Agency, Norway, Poland and Yugoslavia
OAU	Organization of African Unity
UNDP	United Nations Development Programme
UNDP/SF	United Nations Development Programme/Special Fund
UNDP/TA	United Nations Development Programme/Technical Assistance
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
WHO	World Health Organization
WMO	World Meteorological Organization

NOTE

All sums of money are expressed in United States dollars.

I. INTRODUCTION

1. By its Resolution GC(X)/RES/217, the General Conference requested the Board, in consultation with the Director General, to review the activities of the Agency in order to find ways and means to increase its assistance to developing countries [1] and to submit to the General Conference at its eleventh regular session the observations and recommendations resulting from the review. [2]

2. The Board and the Director General have given high priority and devoted much effort to this task and its observations and recommendations are set out in parts II-X of this report.

3. In conformity with the wishes of the General Conference, the review has been carried out in as objective, comprehensive and systematic a manner as possible. All Member States were invited by the Director General to make known their views and recommendations on the subject matter in writing, and 33 responded to this invitation by mid-April.

4. The Board gave preliminary consideration to the matter in February 1967 and established an Ad Hoc Committee of the Whole to study the matters raised by Member States. It requested the Chairman of the Committee to arrange for any Member, not serving on the Board and desiring to supplement its written comments, to send a representative to participate in the Committee's discussions. Romania and the United Arab Republic took advantage of this opportunity. The Committee met in April and reported to the Board in June; the Board's recommendations are based on that report. During the period between the Committee's meetings in April and 10 July three further sets of views and recommendations were received, thus bringing the total up to 36. All of these are reproduced in Annex A.

5. As well as the views and recommendations of Members, the Committee had two other documents before it: the first was a preliminary analysis of the extent to which the Agency's activities benefit developing countries, which had been prepared for the Board's meetings in February; the second was a paper integrating this analysis and the views and recommendations of Members under a number of common headings.

6. The Committee and the Board found all the documentary material on which the review was thus based very useful; it has therefore been consolidated and is reproduced in the three Annexes to this report in order that the General Conference may fully understand the process by which the Board arrived at its recommendations and its reasons for making them, and the Board would urge all Members to study it very carefully.

7. Resolution GC(X)/RES/217 also refers to the need to review the Long-Term Programme for the Agency's Activities [3] "taking into account significant technical developments that have occurred since the current long-term plan was formulated" and invites the Board "to undertake promptly a systematic and objective review of the Agency's future activities" [4]. Revision of that programme can best be undertaken, in the Board's view, when effect is given to the recommendations of the General Assembly's Ad Hoc Committee of Experts to Examine the Finances of the United Nations and the Specialized Agencies. [5] These recommendations call, in effect, for a six-year planning cycle: a

---

[1] Para. 1 of the resolution.

[2] Para. 6 of the resolution.

[3] INFCIRC/50.

[4] Para. 3 of the resolution.

[5] See United Nations document A/6343.

two-year programme and budget, a second two-year plan, and a further two-year tentative plan. In the case of the Agency, the first cycle will, it is expected, cover the period 1969-1974 and, in presenting the six-year programme to the General Conference at its regular session in 1968 the Board will take into account the results of the present review.

II. OBSERVATIONS AND RECOMMENDATIONS

8. Under the terms of Article III.A.2 and III.B.3 of the Statute, the Agency has a special responsibility to foster the development of the practical applications of atomic energy for peaceful purposes "bearing in mind the special needs of the under-developed areas of the world".

9. In reviewing the manner in which the Agency has discharged this task, the Board has noted the very large proportion of the Agency's resources that has been devoted to serving the needs and interests of the developing countries. The Director General has estimated that, of the resources amounting to approximately $86 million placed at the Agency's disposal from 1958 through 1966, about $29.6 million have been made available for direct aid to individual developing countries. [6] A substantial proportion of the remainder has been spent on activities of interest to developing countries. [7]

10. Most of the work that the Agency has done for developing countries has been designed to help them prepare for the major contribution which atomic energy can make to their economic and social development in the years ahead. In most developing countries this contribution is only beginning. While recognizing the need and value of this preparatory work, the Board considers that the Agency should expand and intensify its programmes designed to help developing countries to meet their needs for electric power, which is essential to industrial development, to bridge the growing gap between food supplies and population, and to combat endemic and tropical diseases and malnutrition. This will require increasing emphasis on activities relating to nuclear power, agriculture, hydrology, medicine and industrial applications of nuclear techniques, as well as the provision of more technical assistance and other forms of direct aid. The full application of many of these techniques will necessitate close co-operation with sister agencies of the United Nations.

11. At the same time, the Board recognizes that the Agency is required by its Statute to carry out a number of other important functions and that programmes of assistance to developing countries must be viewed within the context of the Agency's overall responsibilities. Moreover, a review of the Agency's work for the benefit of developing countries should be made within the framework of programmes already approved by the Board and the General Conference and must take into account the funds Member States are prepared to make available to the Agency.

12. Several of the activities that the Agency is required to undertake by its Statute are inherently of potential benefit to all its Members, and many of these activities in turn are of a long-range scientific character. These activities are indispensable to enable the Agency to maintain a high level of scientific and technical competence, keep abreast of significant developments in the peaceful uses of atomic energy and thus render effective service to all its Members, developed and developing alike.

13. With the foregoing considerations in mind, the Board has reviewed, in parts III-X of this report, the main technical programmes of the Agency, as well as certain questions of general direction and administration to which Members have directed their comments. The Board recognizes, however, that the problem of meeting the needs of the developing countries will continue to require the attention of the Agency in the years ahead and must be fully taken into account in the future programmes and budgets of the Agency.

---

[6] See Annex B, para. 3(a) and Table 2.

[7] Ibid., paras. 40-42.

III. RESOURCES FOR TECHNICAL ASSISTANCE AND OTHER FORMS OF DIRECT AID

14. The Board has noted that the provision of technical assistance and other forms of direct aid constitute the main activity through which the Agency helps developing countries. The work done in nuclear research and its applications in many developing countries depends heavily on assistance from the Agency. Apart from sources external to the Agency's budget, the resources available for providing technical assistance and other forms of direct aid are derived from:

(a) Voluntary contributions of money to the General Fund;

(b) Services, equipment and facilities made available gratuitously to the Agency for implementation of the approved technical assistance programme; and

(c) Direct grants of equipment made available through the Agency to developing countries.

15. Despite the valuable contributions in kind and the fact that a number of Member States have recently increased their contributions to the General Fund, the Board notes with concern that the Agency's financial resources are, each year, falling further and further below the amount required to meet the genuine needs for assistance. It therefore recommends that:

(a) Every effort should continue to be made to obtain voluntary contributions from Member States to the General Fund. It urges all Member States to make contributions on a scale that will enable the Agency to reach or approach more closely the target figure set each year by the General Conference for such contributions and requests the Director General to devote special attention to this problem;

(b) Besides the contributions of money made to the General Fund for the Agency's technical assistance programme, Member States should be urged to make available additional resources in the form of equipment, fellowships and experts, and that full recognition should be given to and full use made of such contributions; and

(c) The Agency should promote bilateral projects between the technically advanced and developing countries. For instance requests which cannot be submitted for approval to the Technical Assistance Committee for lack of funds should be brought to the attention of the technically advanced Member States with a request that they consider the possibility of meeting the requests, through the Agency or on a bilateral basis by gift, loan or otherwise.

16. In the view of certain Members of the Board, the monetary value of contributions made in the form of services, equipment and facilities to the approved technical assistance programme, and the monetary value of direct grants and equipment made available through the Agency to developing countries, should be regarded as voluntary contributions to the General Fund of the Agency. The majority of the Board, however, consider that the view taken by the Board in 1959 remains valid and should be maintained, and that the voluntary contributions to the General Fund referred to in Articles V.E.8, XIV.F and XIV.G of the Statute, are gifts of money. They note that the relevant rules subsequently approved by the General Conference in Resolution GC(III)/RES/42 were based upon this view.

17. The Board notes that while major projects are beyond the Agency's own current financial resources and those likely to be available, the work of the United Nations Special Fund has enabled the Agency to carry out some projects which are, in the opinion of the Board, of definite value. It notes that, of the total of 657 Special Fund type projects approved up to the end of 1966, only four have related to the peaceful uses of atomic energy. It expects that, as atomic energy becomes increasingly relevant to the needs of developing countries, a larger proportion of such resources will be allocated to such projects. It is mindful of the fact that the allocation of additional resources under the UNDP/SF component

to nuclear energy programmes will depend upon the economic merit of the projects themselves and of the priorities assigned to them by developing countries. It believes that there may be a lack of awareness in many developing countries of the contribution that atomic energy can already make to their economic development. The Board therefore recommends:

(a) That a special effort should be made to inform the authorities responsible for economic planning and for the financing of economic development of the concrete benefits that atomic energy can already provide to their countries. This might be done at meetings of economic planners, such as meetings of United Nations Regional Commissions or other bodies;

(b) That continuing efforts should be made to ensure that atomic energy authorities in developing countries are familiar with the possibilities offered by UNDP and with its procedures, and that they should be helped to submit detailed proposals for sound projects;

(c) That the Secretariat should intensify its collaboration with the specialized and operating agencies of the United Nations, such as FAO, WHO, ILO, UNESCO and UNIDO, with a view to obtaining their financial and other assistance for projects and programmes in which they and the Agency have an interest, as well as to preventing any duplication of activities and resultant waste of resources; and

(d) That the Secretariat should investigate the extent to which additional resources for the Agency's assistance programmes may be obtained through the United Nations Advisory Committee on the Application of Science and Technology to Development.

IV. MANAGEMENT AND ADMINISTRATION OF TECHNICAL ASSISTANCE AND OTHER DIRECT AID PROGRAMMES

18. The Board gives detailed consideration each year to the report on the technical assistance provided, and its Technical Assistance Committee examines each project involving the services of experts and the grant of equipment. The Board considers that the technical assistance programme is, in general, carried out very satisfactorily and does not wish to propose any major changes in that connection.

19. The Board notes that the balance between the various components of the technical assistance programme reflects the requests of Members themselves, that the present practice of the Agency is consistent with that of the United Nations family as a whole and that the total allocation for technical assistance has not been sufficient in any recent year to meet the requests for experts' services. The Board notes further, however, the views of many Member States that it may not be essential in some cases to associate the grant of equipment with the provision of the services of an expert.

20. The Board therefore believes that the Agency's technical assistance programme should continue to have as its chief object the transfer of knowledge and skills but that the Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the Agency [8] should not, and indeed do not, prevent provision of equipment only in exceptional cases.

21. With regard to other aspects of the technical assistance programme, the Board recommends:

(a) That the Secretariat should study proposals for increasing the effectiveness of the services of technical assistance experts, such as the proposal that experts should in some cases make a series of relatively short visits over a period of years rather than undertaking a single, long assignment;

---

[8] GC(IV)/RES/65, Annex, Part I.E, para. 5.

(b) That, in particular, more use should be made of the Agency's scientific staff as a means of helping to plan, carry out and follow up technical assistance projects, especially those requiring a series of relatively short visits by experts;

(c) That, to the extent possible, greater use should be made of qualified experts from the developing countries themselves, since they are familiar with the problems that such countries face in promoting the peaceful uses of nuclear energy;

(d) That steps should be taken to obtain more cost-free or subsidized fellowships ("Type II" fellowships) from Member States and that detailed information about the fellowships offered by Member States should regularly be brought to the notice of all Members;

(e) That, in regard to all types of assistance particular care should be given to the problem of timing with a view to ensuring that, for instance, demonstration equipment arrives at the time it is needed by a field expert, local counterparts are available for training by an expert in the field and fellowships are available at the right time for completing the training of counterparts after an expert has completed his assignment; and

(f) That consideration be given to possible further simplification of the procedures now followed in the Technical Assistance programmes, particularly with regard to fellowships, and that the Secretariat should make an evaluation of the problems that are the chief cause of delays.

22. The Board notes the stress placed on regional co-operation by many Members. It is aware of the value and importance of projects that lead to a pooling by regional groups of countries of their scarce resources and to intensified scientific and technical co-operation within such groups. The Board therefore recommends:

(a) That the Agency should encourage scientific co-operation between centres, of the type achieved in the NPY and IPA programmes, as well as so-called "sister laboratory" arrangements;

(b) That regional co-operation of the type represented by the Agency's regional training courses and study groups should be intensified; and

(c) That the Agency should continue to consider, on a case-by-case basis, proposals for the support of regional research and training centres which are in line with the broad guide-lines which the Board and the Director General jointly developed in February 1966. [9]

V. NUCLEAR POWER AND DESALTING

23. The Board recalls the emphasis placed by the long-term programme on the Agency's work relating to nuclear power and believes that with the growing competitiveness of nuclear power the Agency's responsibilities in this field will increase. In particular, the Board recommends that the activities mentioned in the following six paragraphs should be intensified.

24. The provision of assistance given to Member States in studying the role of nuclear power in the context of their national long-term energy requirements. The guidance and advice the Agency can give to developing Member States is of particular importance in view of the need for a detailed long-term energy study before nuclear power is introduced and of the fact that it is in the field of nuclear power and its applications, including desalting, that atomic energy will make its major contributions to economic development. In this

---

[9] These are set out in a number of restricted Board documents, copies of which have been made available to all Member States for official use.

connection the Board notes with appreciation the pre-investment and feasibility study that the Agency has performed for UNDP/SF in the Philippines and hopes that other developing countries will seek the aid of the Agency through UNDP to undertake similar studies.

25. Efforts to stimulate the interest of international and regional financing organizations. The Board notes that the Secretariat is in close touch with IBRD in relation to a study the latter is making of the prospects for nuclear power. It notes further that Member States, through their representatives in such organizations, can encourage a positive approach to the financing of nuclear power projects in developing countries. It believes the Agency should explore what role it could play in providing technical services, including safety reviews, for any nuclear power projects that IBRD might wish to consider.

26. Programmes involving regional co-operation. The Board notes that the nine regional study group meetings on research reactor utilization held by the Agency have helped a number of developing countries to prepare and carry out suitable programmes for the use of such reactors.

27. The use of existing nuclear power plants for training purposes. The Board notes that it would be helpful if nuclear power plants in developing as well as in technically advanced countries were to place facilities at the Agency's disposal for training purposes.

28. The provision of advice, help and information to Members, particularly in relation to such subjects as plant siting, plant safety and waste management.

29. The promotion of the conclusion of bilateral as well as multilateral agreements that will help introduce nuclear power and desalting into developing countries. The Board notes the help the Agency is giving in connection with several bilateral studies of dual-purpose nuclear power and desalting projects.

30. The Board has noted the proposal of a Member State that the Agency should foster the establishment of regional nuclear power centres for training purposes and of nuclear desalting institutes. The Board considers that proposals of this kind should be examined in accordance with the broad guide-lines which the Board and the Director General jointly developed in February 1966 for evaluating proposals for regional and international centres. [10] If such centres entailed construction of small demonstration power reactors, careful study should be given also to the question of capital and operating costs and to the economic viability of the centre. A factor of decisive importance in the consideration of such proposals would be the availability of financing from outside sources to carry out the project.

31. The Board considers that if the Agency is to continue to perform its advisory functions with regard to nuclear power and desalting in developing countries, it must keep abreast of the latest research and development and serve as the centre for exchange of information on subjects such as basic reactor engineering, development of various reactor systems and advanced reactor concepts, fuel cycle technology, the economics of nuclear power and desalting, and health, safety and waste management. With regard to nuclear desalting, the Board proposes that the Agency should undertake a study to identify those places where its Member States foresee that economic dual-purpose nuclear power and desalting plants may be constructed in the next decade.

VI. RADIOISOTOPES AND RADIATION SOURCES

32. Under this heading the Board reviewed the Agency's work in applying nuclear techniques in food and agriculture, medicine, hydrology and industry. It is essential that the Agency should play its full role in ensuring that the resources of nuclear science contribute

---

[10] See para. 22(c) above.

to the solution of the increasingly critical problem of food shortage in the developing countries and the related problem of inadequate supplies of fresh water. The Board agrees with the Member States which considered that this work, which is particularly interesting to developing countries, should be intensified and it noted that a recent review of the work of the FAO/IAEA Joint Division had called attention to several agricultural applications of nuclear science that are of potential interest to developing countries and that have still to be fully explored.

33. The Board considers that FAO as well as the Agency should make a special study of the means by which the recommendations in that review can be implemented and that they should give priority to finding the resources needed.

34. The Board also recommends that the practice of organizing co-ordinated research projects, which has been developed by the Agency in connection with food and agriculture, should be extended to other fields of applied research. It invited the Director General to consider how such co-ordinated research programmes could be combined with related technical assistance and study group activities, so that the Agency could concentrate its resources with a view to solving particularly urgent problems, and to draw upon the services of institutes in technically advanced and developing countries in carrying out such integrated projects.

35. The Board also considers that techniques of applying radiation and radioisotopes in industry have now evolved to a stage where far more extensive and more beneficial use could be made of them in developing countries, and it notes with approval that the Agency's programmes are concentrating on the types of industry which are of special interest to developing countries. The programme consists chiefly of transferring existing techniques and knowledge to developing countries by such means as arranging training courses and study tours for experts and technicians from developing countries. It is expected that growing interest in these techniques will lead to an increasing number of requests and that it will be necessary to give more attention to this programme in the future and to enlist UNIDO's co-operation.

VII. HEALTH, SAFETY AND WASTE MANAGEMENT

36. The Board concludes from the views expressed by Member States that the developing countries are generally satisfied with the Agency's programmes to promote the safe use of nuclear energy. It considers that the regulations, standards and manuals prepared by the Agency are coherent, sound and useful and provide a satisfactory basis for the safe application of atomic energy. It urges Member States to adopt and apply these regulations and standards and use these manuals in their own legislation and practices. It notes that legislative uniformity will promote the safe spread of atomic energy applications. It recommends that the Secretariat should continue to increase the help and advice it gives to developing countries to enable them to apply the Agency's standards in their own local circumstances and to overcome specific practical problems of safety and waste management.

VIII. RESEARCH AND SERVICES IN THE PHYSICAL SCIENCES

37. The Board notes that there are some divergencies in the views expressed by Member States regarding the extent to which the Agency should be concerned with advanced and theoretical research. It notes further that most of the Agency's work relating to the advancement of science takes the form of promoting and co-ordinating the exchange of information by means of scientific meetings, panels, publications and the exchange of nuclear data and that this work enables it to render effective service to its Members by keeping itself abreast of developments in nuclear science and technology. This work is also of benefit to Members in that it fosters international co-ordination, reduces duplication, accelerates the advance of science and provides a bridge between scientists in developing and technically advanced countries.

38. The Board also notes that with rare exceptions, of which the chief one is the International Centre for Theoretical Physics at Trieste, the Agency does not engage in, or provide financial support for, fundamental research and that its research contracts and the work done in laboratories are mainly and increasingly concerned with applied research. The Board notes further that since 1963 nearly two thirds of the Agency's research contracts have been awarded to laboratories in developing countries and a further 12% have been concerned with topics of interest to such countries.

39. The Board has given considerable attention to the objects and effectiveness of research contracts and to related work in the Agency's laboratories. The Board considers that research contracts should have the widest practical value and the following main objectives:

(a) To obtain new scientific or technical knowledge of value to the Agency's work, taking into account work already done in national programmes;

(b) To help to co-ordinate research on the subject in question and especially to support projects that combine the work of several laboratories; and

(c) In the case of research contracts awarded to laboratories in developing countries, to serve at the same time as a stimulus to their scientific work.

40. The Secretariat has indicated that the research contracts awarded to date - amounting to approximately 450, of which about half are still in progress - have resulted in more than 750 scientific publications, that there is a trend towards closely co-ordinated programmes on a well-defined central subject of research, and that, in the Secretariat's view, more than 95% of the contracts have produced results that may be classified as "reasonable", "good" or "very good". Certain Members of the Board are in broad agreement with the Secretariat's evaluation and consider that the funds available for research contracts should be increased.

41. Certain other Members of the Board consider, however, that a thorough analysis should be undertaken, where appropriate in conjunction with the specialized agencies concerned, of the contribution that research contracts make to economic and social development in developing Member States and that the information available about the practical results achieved is inadequate. They note that compared with the sums available for the support of national and regional research, the Agency's resources are very small and that the results of its efforts to achieve the first object mentioned in paragraph 39(a) above must be judged in this light. They wish the Secretariat to devote further study to the programme so that, in particular, its purposes may be better defined and the results achieved more fully evaluated.

42. The Board recommends that Member States should be encouraged to enter into more agreements with the Agency that do not call for a financial contribution from the Agency, so that the Agency may foster co-ordinated research on topics of interest to developing countries at as low a cost to itself as possible. As far as possible, research projects of limited interest should be paid for by the interested parties or other outside sources.

IX. INFORMATION AND TECHNICAL SERVICES (including symposia, conferences and study groups)

43. The Board notes that several Member States consider that the Agency should take steps to increase the participation of scientists from developing countries in the Agency's scientific meetings and that a larger proportion of these meetings should be held in developing countries and on topics of interest to such countries.

44. The Board also notes from the analyses prepared [11] that:

(a) At the invitation of the host Governments, a certain number of scientific meetings are held away from the Agency's Headquarters each year and that some of these are held in developing countries;

---

[11] See para. 5 above.

(b) Some of the most successful symposia have been devoted to research in which advance is rapid but practical results cannot immediately be foreseen (e.g. thermonuclear fusion and plasma physics, magnetohydrodynamic generation of electricity, use of plutonium as a reactor fuel) [12];

(c) Certain symposia on topics of special interest to developing countries have attracted a disappointingly small number of participants [12]; and

(d) Holding a scientific symposium in a developing country has the advantage of leading to greatly increased participation by scientists from the host State and contact with eminent scientists from abroad but it does not, on the average, lead to an increase in the participation of scientists from other developing countries. [13]

45. The Board also notes the suggestion made that the Agency might help to pay the travel costs of certain scientists from developing countries. [14] It further notes the possible inference that the most effective way of meeting the scientific needs of developing countries might be to increase the number of regional meetings of the study group type held in those countries, that is, meetings with limited participation, in respect of which the Agency pays at least part of the cost of attendance of scientists from developing countries, and of which the principal object is the transfer of knowledge from advanced to developing countries. [15]

46. The Board accordingly recommends that the number of study group meetings on topics of interest to developing countries, held at suitable locations in developing countries, should be increased to the extent practicable. To provide for this increase the total number of study group meetings or related meetings should, if necessary, be decreased.

47. With regard to the desirability of holding more scientific symposia in developing countries, the Board recommends that the Director General should make a careful study of the matter, bearing in mind:

(a) The stimulus to the advance of nuclear science in a developing country which can be given by holding an Agency symposium in that country;

(b) The fact that the principal object of international symposia is to serve as effectively as possible as a means of exchanging information between all Members on the latest results of research and development;

(c) The extra costs incurred by the Agency in holding symposia in developing countries. (In accordance with a decision of the Board, those costs are, in practice, borne chiefly by the Agency.) [16];

(d) The relative costs incurred by Governments of developing countries when symposia are held at the Agency's Headquarters or elsewhere in technically advanced countries on the one hand and in developing countries on the other; and

(e) The possibility of partial payment by the Agency of the cost of participation by a limited number of scientists from developing countries.

48. The Board notes that there are several different types of panel: for instance, those that advise the Director General on programme formulation, those that draft regulations, and those that co-ordinate research contracts. In the case of many panels, particularly

---

[12] See Annex C, para. 108.

[13] See Annex B, para. 197 and Table 19.

[14] Ibid., para. 208.

[15] See Annex C, para. 109.

[16] See document GC(V)/155, para. 301(e).

those that advise the Director General on programmes, participants will necessarily be largely drawn from the most advanced centres and there are obvious advantages in meeting at Headquarters, or possibly at an advanced centre itself. On the other hand, panels for the co-ordination of regional research programmes or dealing with other problems specific to a region or to the developing countries can advantageously be held in developing countries.

X. GENERAL DIRECTION AND ADMINISTRATION OF THE AGENCY

49. Under this heading the Board considered the views expressed by Member States on the question of annual and biennial sessions of the General Conference, on co-ordination with the specialized and operating agencies of the United Nations, and on the geographical distribution of the staff of the Secretariat.

50. The Board considers that the annual session of the General Conference, which is customarily very short compared with similar meetings of other organizations of the United Nations, provides a valuable opportunity for a review of the development of the peaceful uses of atomic energy in Member States, for informal contacts and consultations between the senior officials of atomic energy authorities and others concerned with the development of nuclear energy, as well as for reviewing the development of the Agency's own work. It therefore recommends that the present system of annual sessions should be maintained.

51. With regard to co-ordination, the Board notes that co-operation with the United Nations and interested specialized agencies is, in general, close and effective and, in particular, that the establishment of the FAO/IAEA Joint Division, now placed on a permanent footing, will lead to the pooling of the resources of both organizations in carrying out a single and comprehensive programme relating to the application of atomic energy in food and agriculture.

52. With regard to the question of geographical distribution of the staff of the Agency, the Board considers that in the light of the very technical character of the Agency's programmes, for the implementation of which highly qualified staff are required, it is important that the Secretariat should adhere very closely to the basic principles regarding the recruitment of staff set out in Article VII.D of the Statute which provides as follows:

> "The paramount consideration in the recruitment and employment of the staff and in the determination of the conditions of service shall be to secure employees of the highest standards of efficiency, technical competence, and integrity. Subject to this consideration, due regard shall be paid to the contributions of Members to the Agency and to the importance of recruiting the staff on as wide a geographical basis as possible."

53. The Board notes that it is the Director General's policy to restrict the proportion of the Professional staff having permanent contracts. This would have the effect of increasing the opportunities for the appointment of staff from developing countries. The Board considers that this would be of special value in enabling scientists from developing countries to take part in planning and carrying out the work of the Agency.

54. The Board also notes that many staff members are drawn from certain of the developing Member States as well as from technically advanced Member States. At the same time it notes that there is no staff at all from several other Member States which may wish to have their nationals on the staff. It recommends, therefore, that the Secretariat should call the particular attention of such Member States to all opportunities to put forward qualified candidates as vacancies occur. For their success, such efforts will require the full co-operation of the Governments concerned.

55. The Board recommends that the Agency should consider the desirability of establishing an internship scheme designed to provide opportunities for officials, engaged in economic planning and the planning of nuclear energy programmes in their own countries, to work for a reasonable period of time in the Secretariat in order to enable them to become familiar with the operations of the Agency and the services offered by it.

ANNEX A

VIEWS AND RECOMMENDATIONS OF MEMBER STATES

Bolivia

"No. D.G.O.I. 2717/305 "15 December 1966

"Maximum co-operation in the form of experts and, above all, in the form of material and equipment should be extended to Member States initiating programmes of activity in the peaceful uses of nuclear energy."

Canada

"7 April 1967

".....

"In preparing their assessment of the Agency's activities, and in considering how the flow of assistance to developing countries might be expanded, the Canadian authorities have worked on the following assumptions:

(a) According to its Statute, the Agency has a number of functions it is expected to perform, and the technical assistance programme, while one of the most important of them, must be viewed in the context of all of the Agency's responsibilities to serve the needs of developed and developing countries;

(b) A review of the Agency's activities and proposals for increasing the flow of technical assistance to developing countries must be made within the framework of the programme which has been approved by the Board of Governors, and of the funds which Member States are prepared to make available to the Agency for the regular programme and for the operational (technical assistance) programme; and

(c) A review of the general debate in recent years does not indicate that there were any fundamental objections to the scope and nature of the Agency's programme; the most basic concern expressed by Member States was the lack of sufficient funds, a problem common to all United Nations agencies. The Agency's programme and budget are reviewed carefully each year by the General Conference, the Board and its Committees and, accordingly, it is our understanding that they reflect reasonably closely the ability of the Agency, with the limited funds available to it, to respond to the needs of all Member States. Since Canada has participated actively in these bodies and has had an opportunity to express its views and to make suggestions for improving the Agency's programme, there are no new fundamental proposals which we wish to make at this time.

"On the basis of these assumptions and understandings the Canadian Government welcomes the opportunity to participate in this review of the Agency's activities, and it shares the hope that some modifications might be made in its administration and programme which would release funds for assistance to developing countries.

"Among the suggestions which we had intended to make in an effort to ascertain whether more funds could be channelled to technical assistance, was the proposal that the Agency's activities should be examined in the context of broad programmes in such fields as reactor development, the application of isotopes in industry, medicine, agriculture etc.,

nuclear power for desalination and the generation of electricity, safeguards and the exchange of scientific and technical information. We were pleased, accordingly, to find that the excellent report contained in ... [Annex D] ... analyses the Agency's activities along these lines. In our opinion this review provides a very useful basis for assessing the value of the Agency's programme for developing countries and for considering the allocation of funds for specific projects in the forthcoming years.

"In order to assist the Agency in formulating its programme of work in these various fields in forthcoming years, we wonder whether a few of the symposia and panels could not be designed to provide the information required to assist the Agency in this respect. In this connection we might recall a proposal which the Canadian Delegation has made in the Board and in its Committees on earlier occasions, that in response to any proposals for the establishment of regional centres for training in the use of isotopes the Agency should carry out studies which would indicate whether such centres were necessary and if so in what regions of the world and in what fields (agriculture, health, industry etc.). These studies should, naturally, be carried out in conjunction with the specialized agencies of the United Nations and any other international organizations working in these fields.

"In the course of the review we think it might be desirable to explore once again (and perhaps finally) the perennial question of how much equipment should be supplied to developing countries under the technical assistance programme. It has been the traditional Canadian view that this programme of the Agency should focus its attention primarily on the transfer of skills, know-how and information to developing countries, and that equipment should be provided mainly to assist the expert in carrying out his project. If, after all sound requests for experts have been met, there are funds remaining in the Operational Budget, then it would be desirable to consider the use of these funds for the provision of additional equipment. It might be noted in this connection that some 60 out of the Agency's present total of 97 Member States are at the moment receiving help under the UNDP/TA Component. Many of these have recently joined the Agency, and we expect a number of them will not have received any help through the technical assistance programme in developing their plans for the peaceful uses of nuclear energy. In our view the requests for experts from these, as well as from other, developing countries should be met as far as possible before any substantial amount of the Agency's funds is spent on equipment to be provided under the technical assistance programme. In this context we should like to have the Committee as a whole review carefully the precise range of requests received by the Agency for experts, what proportion of them cannot be filled for lack of money or other reasons, and, accordingly, what share of technical assistance funds can reasonably be allocated to equipment.

"The Ad Hoc Committee of Experts to Examine the Finances of the United Nations and the Specialized Agencies of the General Assembly of the United Nations has made a number of suggestions intended to streamline the administration and improve the planning procedures of member organizations. [1] It is the hope of the Canadian authorities that the implementation of these recommendations will lead to some savings which, in turn, can be devoted to new phases of the Agency's programme for assisting Member States.

"In a number of the views and recommendations of Governments which have been circulated in recent weeks, there has been a substantial amount of criticism regarding the distribution of posts in the Secretariat of the Agency. Implied in these criticisms is the suggestion that a greater percentage of the positions should be opened to developing countries. We consider that this matter should be carefully considered either in the Committee of the Whole or in the Administrative and Budgetary Committee. The Canadian Mission intends to send a further communication to you on this subject.

---

[1] See United Nations document A/6343.

"In conclusion the Canadian authorities look forward to joining with other Member States in this review of the Agency's activities, and it is hoped that through this examination it will be possible to increase the flow of assistance to developing countries without at the same time jeopardizing the value of other phases of the Agency's work which is designed to bring the benefits of nuclear energy to all Member States."

Chile

"No. 177/48 "22 December 1966

".....

"My Government considers it especially important that all developing countries which indicate or have indicated their intent to participate should be heard from throughout the review. We therefore believe that the Board should carry out the review either by itself or through a committee or some other group, but in any case inviting representatives of the developing countries to express their opinions.

"My Government believes that representatives of all Member States which showed interest in this matter during the debate on the subject at the tenth regular session of the General Conference [2] should be allowed to participate automatically, without having to make formal application of any kind.

"We also believe that invitations to the meetings on this question should be extended to all Member States which indicate by letter to you their interest in participating."

Congo, Democratic Republic of

"597/PM/LA/V5 "12 December 1966

"We should like first to welcome the efforts taken by the IAEA since its inception to assist the developing countries. Of particular importance in this respect is the idea of establishing regional centres.

"The action taken by the IAEA along these lines represents an attempt to define in concrete terms the components of a regional scientific policy in regard to the peaceful uses of atomic energy. It is becoming more and more clearly necessary that governmental action to assist nuclear science should develop on a regional, if not international, level and that the form of such action should be functionally oriented without losing its simple and flexible character.

"Experience gained in the development of scientific research and university training in the highly specialized and complex field of nuclear energy applications clearly shows that such efforts only begin to be worthwhile if there is far-reaching mobilization of the resources and facilities devoted to nuclear science and close co-ordination of scientific activities in order to avoid costly duplication.

"In this connection a regional centre can play an important part, co-ordinating and rationalizing the work of the countries within the region concerned. It is also essential that the centre should be able to call on the Agency's unstinted support, especially at the beginning. Such support is particularly necessary in Africa since the funds available to African countries are vary limited. To sum up:

---

[2] Summarized in documents GC(X)/COM.1/OR.70, para. 28; OR.73, paras. 7-12; and OR.74, paras. 5-23.

- The IAEA should offer the regional centres expert services for periods longer than a year. We think two years at least would be necessary for the experts to train local staff in research to take over from them. At the moment IAEA experts only come for short periods, usually not more than six months;
- Research should be encouraged in regional centres by the award of research contracts. This would mean that the IAEA should widen its interests and include subjects of interest to Africa. The IAEA attaches too much importance to subjects of interest almost entirely to Europe and Asia (rice cultivation; power reactors; storage of radioactive wastes);
- The already substantial IAEA assistance in the form of equipment should be increased. In particular, the IAEA should accept the principle of interchangeability between experts and equipment. In other words, if a regional centre does not receive the expert requested, the corresponding funds should be used for the purchase of equipment;
- The IAEA should help OAU to organize seminars and symposia on the uses of nuclear energy in biology, medicine, agriculture etc. in Africa. In this connection we hope the IAEA will assist the Congo in organizing the symposium on the peaceful uses of atomic energy to take place at Lovanium in 1967."

Czechoslovak Socialist Republic

"8 February 1967

"... the Czechoslovak Socialist Republic believes that it would be useful to undertake a review of the Agency's activities in the spirit of ... Resolution [GC(X)/RES/217], since this might help to point the way to new possibilities of increasing the effectiveness of the aid given by the Agency in accordance with national plans for the development of research and the peaceful use of nuclear energy. In my country's view, the resolution adopted at the recent session of the General Conference affords a means of assessing the contribution which the Agency's activity makes to economic and technical development, with special regard to the needs of the developing countries.

"In this connection, the Czechoslovak Socialist Republic believes that any changes in the trend of future activity could only take place within the framework of the possibilities afforded by the budget as approved. Countries which need wider assistance from the Agency could, in our view, make more use of the possibilities offered by UNDP."

Denmark

"No. 104.C.22 "13 January 1967

"5.24-4p "18 January 1967

"After correspondence with the Danish Atomic Energy Commission, I have the honour to put forward the following comments in reply to your request to the Government of Denmark.

"The possibility of increasing the Agency's role in the economic and technological advancement of the developing countries will depend primarily on the amount of resources which the Agency has available for this purpose, especially the size of the funds devoted to its programme for technical assistance.

"The resources available for the Agency's technical assistance activities are provided through voluntary contributions from Member States to the General Fund, through gifts to the Agency in kind and through the United Nations expanded programme of technical assistance.

"Denmark has regularly made voluntary contributions to the General Fund in amounts corresponding to the same percentage of the target of the General Fund as that upon which Denmark's contribution to the Regular Budget is based; further, Denmark is every year placing at the disposal of the Agency's fellowship programme 4-5 Type II fellowships. As for the UNDP/TA resource placed at the disposal of the Agency, Denmark's contribution follows from its membership of the United Nations.

"With regard to the financing of the Agency's future assistance to developing countries, it is the intention of the Government of Denmark to continue making proportional voluntary contributions to the General Fund and offering to provide the Agency with a number of Type II fellowships. It might be mentioned in this connection that a wider subscription of Member States to the principles of voluntary contributions as stated in Resolution GC(V)/RES/100 would improve the Agency's possibilities of increasing its assistance to developing countries.

"A considerable expansion of the Agency's assistance to developing countries would need resources that are not and hardly could be made available within the present budgets of the Agency. Moreover, the need for increased technical assistance in the nuclear field should be compared with and considered in close relationship to the need for assistance in other fields to developing countries. Should assistance towards the peaceful application of atomic energy in developing countries be given a priority that justified an expansion of the Agency's programme, further resources should rather be made available to the Agency under the UNDP/TA programme than be provided by voluntary or assessed contributions directly to the Agency from Member States.

"The above remarks regard mainly the financial aspects of an increase of the Agency's assistance to developing countries. The Danish Government is, however, prepared to consider seriously all views and proposals submitted during this review of the Agency's activities, including suggestions to rationalize and make more effective the Agency's assistance to developing countries within the present financial limits, provided that such suggestions may be incorporated in the review."

Finland

"No. 4784 "15 February 1967

"....

"The need for increased assistance to the developing countries is generally recognized and was reflected by the Resolution concerning the Review of the Agency's Activities of 28 September 1966 [3]. The importance of the problem is also felt in Finland, and her Government is striving to contribute more for technical assistance programmes of the United Nations family.

"As to the programme and activities of the IAEA it should be noted that in sub-paragraph (c) of the above-mentioned Resolution due recognition was given to the work of the Agency for the developing countries in advanced fields of scientific work. The Secretariat might still study possibilities to intensify the Agency's work in fields of fundamental interest for the developing countries. In this way improved results may be gained in co-operation with the United Nations specialized agencies.

"Taking into consideration the limited resources that are available, the proper planning and administration of technical assistance activities in all phases assume great importance when this Review is being discussed. The administration might be rendered somewhat more effective - as is also indicated in comments coming from various other

[3] General Conference Resolution GC(X)/RES/217.

Member States. It would be useful if the Agency could assist developing countries in defining areas of high priority (reference is made to paragraph 141 of The Long-Term Programme for the Agency's Activities - INFCIRC/50). It is of utmost importance that development plans in the Agency's field should be fully co-ordinated with the overall national development plans; e.g. the use of nuclear power must be based on detailed and well-established economic planning. Various kinds of feasibility studies and evaluations carried out in co-operation with, or through, Agency missions can play a very important role. This kind of basic study would help the developing nations in preparing their development programmes with a greater degree of utilization of the services of the IAEA, financed through UNDP.

"Owing to the lack of resources and the high demand for assistance, the question of financing is a most difficult problem. At the present time the funds are derived either from the voluntary contributions to the General Fund or through UNDP. The operational activities based on the contributions to the General Fund are a regular feature in the work of the IAEA, and with this method good results have been reached. It is regrettable, however, that the 2 million dollar targets for the voluntary contributions have not been reached, which has made planning difficult and hampered the work of the IAEA. The Agency should use all the means at its disposal to influence the Member States to contribute to the General Fund, at least according to their full percentage assessments for the Regular Budget.

"Having in mind the continuous nature of the programme financed from the General Fund, and the need for long-term planning, it cannot be considered satisfactory that the IAEA so heavily relies on voluntary contributions. Therefore full conclusions should be drawn as far as the financing of the programme is concerned."

Greece

"No. 174/DOAE/8 "16 February 1967

"... although at present no views or recommendations concerning the increase of the Agency's assistance to developing countries are to be submitted on the part of the Greek Government, the latter wishes nevertheless to reiterate its full agreement with the preamble to the Resolution [3] adopted during the 110th plenary meeting of the General Conference on 28 September 1966."

Guatemala

"834 "16 December 1966

"1. In the awarding of fellowships, it would be advisable for the Agency to carry out an exchange of correspondence with the competent national nuclear energy authority in the beneficiary country regarding the type of training programme under consideration and the country (centres, universities, laboratories, etc.) tentatively or finally selected as the place of the candidate's studies. This would provide the host country with better background material and enable it to ensure that maximum benefits were derived from the fellowship, since it would thus be providing aid best suited to the requirements and needs of the interested country.

"2. In the award of equipment, through the Regular Programme of the Agency or through UNDP/TA, it might be useful if the Agency here also carried out an exchange of correspondence with the requesting country (which in most cases would not necessarily mean an excessive delay in supply negotiations), so that the equipment, instruments, materials etc. correspond as closely as possible to the specific needs for which they have been requested.

"3. The time elapsing between a country's request for equipment, for example, and the date on which the Agency supplies the assistance, is at times so long that the development programmes based on the use of this equipment and scheduled for specific periods sometimes suffer serious setbacks. While it is true that the Agency must often take action on requests from various countries at the same time, it might nevertheless be worth the effort to make a study of the overall situation in this respect, so that the assistance given fulfils its purpose as efficiently as possible.

"4. With respect to the provision of equipment, which normally goes hand in hand with a visit by an Agency expert, it would also be extremely useful to make a study of ways in which this could be co-ordinated most effectively with the visit of the expert, since otherwise the original objectives of the assistance remain partially unfilled. This was the case here in Guatemala some years ago when we were visited by an outstanding expert whose mission was largely frustrated because the equipment which he needed for making his demonstrations and giving advice had not yet arrived.

"5. The Agency is constantly sending experts to countries with developing nuclear programmes. Often people in nearby countries are completely unaware of the work being done by the expert in their general area. For them contact with such an expert would be of immense value. Admittedly, such contacts would have to be kept brief, lest the expert's obligations in respect of other areas be affected. In these cases it would be highly desirable if the Agency could notify atomic energy authorities in the countries nearby of the expert's presence in the area, the duration of his stay, his next assignments, the type of work he was doing and, in general terms, was capable of doing, the advice he could offer on the basis of his professional training, etc. For example, we have learned unofficially that Miss H. Farran, an Agency expert in medical applications of radioisotopes, is at present in El Salvador, and situations like this occur often. This would make the expert's work more widely available and would to a certain extent further the development of nuclear programmes on the regional level, which is precisely what the Agency has been advocating over and over again.

"6. The National Atomic Energy Institute recognizes the value of the assistance which the Agency is normally able to provide, since almost without exception Guatemala has been able to take advantage of it in the best possible way. It therefore believes, in the interest of obtaining the best possible results from this technical assistance, that it would be desirable for the Board, in the course of the recommended review, to draw on these - and other - suggestions so that it could prepare its final recommendations in the knowledge that they will contribute greatly to a more effective discharge of the difficult but praiseworthy task being performed by the Agency on behalf of its Member States."

India

"No. A/5 "24 June 1967

"The principal aim of the proposed review should be to keep in mind the fact that the Agency operates on an extremely limited budget and that the money should therefore be spent with extreme care, consistent with the aims and objectives of the Agency.

"I. Finances

"The expenses of the Agency are broadly divided under three heads: (i) Regular Budget; (ii) Operating Fund I; and (iii) Operating Fund II. Whereas the Regular Budget consists of assessed contributions from Member States, Operating Funds I and II are financed by voluntary contributions. Operating Fund I is used for the Seibersdorf Laboratory, the Monaco project and the International Centre for Theoretical Physics. Operating Fund II is used for technical assistance and training. The shortfall in voluntary contributions during the past few years and the resultant constraint on funds available for technical assistance, are shown in Table I.

Table I

Funds for technical assistance under the Agency's Regular Programme

Year	Target set for voluntary contributions to the General Fund	Amount pledged	Amount budgeted for technical assistance	Funds available for technical assistance
		(in U. S. dollars)		
1961	1 800 000	1 261 200	1 361 000	980 881
1962	2 000 000	1 380 470	1 625 000	1 146 294
1963	2 000 000	1 437 394	1 799 000	1 209 173
1964	2 000 000	1 374 447	1 680 000	1 063 224
1965	2 000 000	1 256 920	1 749 000	1 199 526

It is interesting to note that the drop in voluntary contributions has never resulted in any reduction in Operating Fund I, in which the figures allocated to the various laboratories have steadily registered increases over the years. This is particularly true of the Theoretical Physics Centre at Trieste; during 1965 the budget figure for the contribution of the Agency to the Trieste Centre was $55 000, whereas in 1966 this figure rose to $110 000. It was further raised in 1967 to $150 000. This clearly shows that the shortfall in voluntary contribution targets has affected programmes for technical assistance and training only. And it is these aspects of the Agency's work which are recognized to be of prime importance to the developing countries. In our view, therefore, the funds allocated to the three laboratories should be progressively reduced and the Agency should withdraw itself gradually from these activities.

"Many countries have expressed strong views that the financing of activities such as theoretical research which are not of any immediate benefit to developing countries should not be done by the Agency and that these should come under the purview of the other United Nations organs, such as UNESCO.

"It can further be seen that, under the Regular Budget, expenditure in respect of the Secretariat has shown steady and not easily defensible increases. The figures under this head, for the various years, are as follows:

1962 - $3 496 560
1963 - $4 332 070
1964 - $4 429 590
1965 - $4 891 650
1966 - $5 707 352
1967 - $5 936 000
1968 - $6 676 500

An examination of the overall budget shows that there has not been a commensurate increase in the amounts expended under Operating Fund II to justify the increases in the cost of the Secretariat. The only activity that seems to have registered a sizeable increase is the operating costs of the laboratories under Operating Fund I.

"Notwithstanding the increase in the Secretariat expenses, the General Conference has steadily cost a sum of around $245 000 annually for the past few years. The annual expenditure in respect of the Board of Governors has also been steady at around $360 000.

"In our view, therefore, the staffing of the Secretariat should be gone into carefully and appropriate pruning done in order to ensure that the annual rate of increase of the Regular Budget is minimal and that in any case it does not exceed, say, 5%. It must be borne in mind that the assessed contributions for the Regular Budget have to be paid in hard currency and that the present steep rate of increase in these contributions is beyond the financial capabilities of most developing countries.

"II. Staffing and related matters

"It has been indicated above that the cost of maintaining the Secretariat has increased in a manner that is not commensurate with the increase in the volume of the Agency's activities in those regions which are of prime importance to developing countries. This may be attributable to the fact that in the totality of the technical side of the Secretariat an unduly heavy percentage consists of permanent staff members. Such a situation would appear to necessitate the employment of additional personnel for meeting new and diverse needs in the field of atomic energy. This tendency inflates staffing costs and results in an imbalance in the ratio of the amounts spent to the results achieved.

"The above tendency gives rise to another form of imbalance in that the principle of equitable geographical representation cannot be sustained. This state of affairs could be remedied partially by ensuring that at least officers at Professional levels in the Secretariat are appointed only on temporary contracts of 2-3 years' duration. Categories such as interpreters and other similar services, where experience contributes to improved performance, would naturally constitute exceptions to this rule. The rotation of personnel, especially in the scientific and technical cadres, will ensure a reasonably satisfactory equitable geographical distribution, while at the same time infusing new blood into the scientific and technical staff of the Agency. It is our considered view that an active scientist could serve the Secretariat usefully for a maximum period of two years (in special cases, three). If a scientist remains in the Secretariat longer than this, he tends to become scientifically stale and can no longer perform his duties satisfactorily. Furthermore, the subject of his speciality may be important to the Agency at a given period of time but may cease to merit priority sometime later, as a result of which the scientist concerned becomes an unnecessary financial drain on the Agency's resources. The principle of rotation of scientists enables the Agency to choose men with specialities that conform to the then current scientific and technical requirements of the Agency.

"The above arguments would also apply to the Agency's laboratories. A scientist at a senior level appointed to the laboratory will naturally assemble around him equipment to conform to his special areas of interest; the presence of the equipment will in turn necessitate his continued stay at the laboratory. Even then, when the scientist ultimately leaves the laboratory, it may be unlikely that his field of work would continue to be of interest to the Agency. The new scientist appointed in his place may have different interests and would therefore require quite different equipment. This leads to a chain reaction of mounting expenditure which is not easily defensible.

"It has been estimated that the total expenses per Professional staff member, excluding the investment expenses in the Seibersdorf Laboratory, is $24 000 per person per year. Similar estimates have been made for laboratories in developing countries and we feel that the amount of money required to be spent on a scientist doing equivalent work in a developing country would be very much less. Thus, if the amount of money at present being spent on the Agency's laboratories were to be spent in developing countries or in regional laboratories, a much larger volume of work could be supported. It has been repeatedly pointed out that those aspects of the work of the Agency's laboratories which constitute routine services to developing countries can be easily performed by more developed countries for small fees. In special cases where this is not feasible, a skeleton routine technical staff could easily conduct what are at best routine repetitive procedures at minimal cost to the Agency. In such cases the charges levied on the developing countries for these services could easily be made commensurate with the expenses incurred so that the Agency would not have to commit itself to any sizeable financial outlay for this activity.

"III. Technical assistance programmes

"The present procedures connected with the technical assistance programmes are based on rules and regulations formulated by the United Nations Expanded Programme of Technical Assistance. Many of the lacunae in these procedures have been allowed to continue because any change in these procedures involves a reference to the appropriate authorities, where requests for deviations from rules are invariably turned down. This state of affairs has to be radically modified along the lines suggested below.

"Developing countries which are on the threshold of an atomic energy programme may not have trained people who can make appropriate requests for technical assistance. In such cases the Agency's Secretariat should assess their requirements and help them to formulate properly requests for technical assistance. Problems such as the drawing up of a programme, training of local personnel, setting up of laboratories, procurement of equipment and choice of experts should be carefully gone into. The return of persons from advanced countries after training should be co-ordinated with the setting up of laboratories, placement of equipment and arrival of experts, so that technical assistance funds are not frittered away.

"In the case of developing countries where a considerable base already exists, the countries may require equipment only, experts only and in certain cases equipment and experts. The present procedures do not provide for all these possibilities and they should be modified so that each country gets only what it wants. This would result in more funds becoming available for allocation to other technical assistance programmes.

"Experts sent to developing countries should as far as possible be chosen from other developing countries which have gone through the difficulties of starting from scratch. Furthermore, as a rule, the provision of training facilities in advanced countries or in contiguous regional laboratories for scientists from developing countries would be preferable to visits by experts to the developing countries.

"It should be possible for the same expert to visit a developing country for short periods of time on a number of occasions in connection with a technical assistance programme. At present the provisions which require experts to spend long periods of time in developing countries automatically eliminate many of the best men available for this purpose.

"It is our view that in cases where the situation so demands, an expert should visit a developing country for a short period of time in the first instance in order to make a preliminary assessment of its requirements and the kind of training, development and research programmes it should undertake. This would enable the Secretariat to initiate suitable co-ordinated action. When the candidates chosen for training have received their training in advanced countries and have returned, when the design and construction of laboratories have been completed and when the appropriate equipment is in position, the expert could again visit the country (probably for a slightly longer period) to initiate the programme planned earlier. During the interim period, the Secretariat of the Agency should provide all the liaison between the country and the expert concerned.

"It is however recognized that the Secretariat has in the recent past made efforts to remedy this situation along the lines indicated above. These efforts should continue and should be supported.

"IV. Regional laboratories and research contracts

"It has very often been asserted by developing countries that the setting up of regional laboratories is one of the best methods of helping them. Even here, as in the case of the Agency's own laboratories, it is our considered view that the Agency's role should be that of a catalyst which would initiate and complete the process but would not subject itself to sustained financial liabilities in the process. Of course, a small fraction of the

funds to cover the expenses of such centres, which constitute the foreign exchange component for equipment/experts, or for the maintenance of complex equipment, can always be provided by the Agency.

"The value of regional laboratories can be further enhanced by providing facilities for the operation of research contracts in such institutions. Equipment made available in connection with research contracts is invariably left in the institution in which the research contracts were initiated, and therefore, if such equipment were to remain in centralized places like regional institutions, it would be of use to more than one country in that region. Furthermore, the frequency of use of sophisticated and expensive equipment in developing countries is hardly sufficient to justify the continued presence and use of any such equipment in one developing country alone. The procedure suggested will have the added advantage of providing a training centre for persons in that region, thereby curtailing travel costs.

"In many developing countries the most immediate use of atomic energy consists in its applications to agriculture, industry and medicine. Hence, these aspects should be given priority in the establishment of regional laboratories. In addition, proper emphasis should be laid on problems peculiar to the regions in question.

"V. Nuclear power programmes and desalination

"One area in which the Agency can be helpful is in assessing the suitability of a developing country to undertake a nuclear power programme. The type of high-level technical and economic assessment of the factors involved which the Agency can provide would not only go a long way in enabling the country concerned to take a decision regarding the project, but also in enabling it to obtain adequate economic and other assistance from more advanced countries. The Agency is already doing some work in this direction and this should be expanded.

"Many developing countries have areas which are in dire need of water and power. Hence, desalination programmes coupled with atomic power programmes will prove to be of importance in solving the economic woes of such countries. The Agency should therefore give a high priority to this area of development.

"VI. Safeguards

"Safeguards activities have become a necessary function of the Agency. However, as at present envisaged, the technical and financial implications for the Agency arising out of the exercise of safeguards functions are not clear. Hence, efforts should be made to evolve procedures for safeguards which would be technically feasible and economically acceptable. The economic feasibility of the Agency's undertaking complex safeguards inspections is by no means established at present. It is our considered view that these inspections will be extremely expensive and that their cost should be fully borne by the countries involved.

"VII. Other activities

"Great caution should be exercised in developing projects such as the International Nuclear Information System, which can ultimately prove to be quite a strain on the meagre financial resources of the Agency. The Agency should do no more than to establish standard codes and programmes for such purposes. Any country in a specified region which has computer and other facilities should be requested to make available such facilities to other countries in the region. Here again, the Agency should act as a catalyst to improve the efficiency of such a process of information dissemination.

"While the Agency has already done a considerable amount of work in promoting radiation safety standards and regulatory practices, it would do well to strive to simplify many of the complex procedures involved in such operations as the international transport of radioactive materials, insurance incident to such transport, liability in the event of nuclear accidents and emergency assistance in the case of nuclear incidents."

Iran

"14 December 1966

"In the tenth session of the General Conference extensive information was obtained on the activities of the Agency in past years and I wish to express my appreciation for the efforts and accomplishments of the Agency during this period of its existence.

"A certain number of points concerning the assistance to developing countries and the search for practical ways and means to meet the needs of those countries are presented below. It would appear that the activities of the Agency have in certain respects tended toward directions which were less profitable to developing countries than to countries which were not much in need of the results of those activities. The main 'raison d'être' of the Agency is to strive to bring nations nearer to each other and foster the cause of peace in the world. The best way to attain this aim is that the activities of the Agency be to the benefit of the majority of Member States, so that the existing difference in the scientific and technical levels of Member States may be reduced as much as possible and that ways and means may be found to enable developing countries to make increasing use of nuclear energy and benefit from the experience of developed countries in that field.

"The promotion and encouragement of atomic research is commendable, but it seems that the expenditure of large sums on advanced research bordering on the frontiers of knowledge would not be an indispensable task of the Agency; it would seem that research on the practical applications of atomic science and technology can be better considered as a universally useful activity of the Agency.

"I now submit to you the following points.

"I. TECHNICAL ASSISTANCE

"A. The budget for 1967

"In the budget of 1967 the percentages allocated to some of the items are as follows:

Personnel (salaries and wages, common staff costs, duty travel of staff)	62%
General Conference and Board of Governors	6%
Research contracts and Laboratory charges	14%
	82% [4]

Considering the above figures, and different other expenses to be met, it is apparent that the budget left for technical assistance and training will constitute only a small percentage of the total budget.

"In the report of the Board of Governors to the General Conference, it is indicated that the demand for technical assistance has increased almost four times since 1959 ($690 000 in 1959 and $3 033 500 in 1966). [5] Compared to this increasing need of developing countries for technical assistance, the increase in the budget for technical assistance has been only 50% in excess of the 1959 budget ($619 400 in 1959 and $901 600 in 1966). The inadequacy of the funds to meet the demand is clear and measures destined to obviate this deficiency should be considered.

---

[4] GC(X)/333, Table 1.

[5] GC(X)/330, para. 22.

"The percentage of the expenses for experts in combined Agency-UNDP/TA programmes, covered by the Agency's budget, has decreased from 59% in 1965 to 39% in 1966. [6] For developing countries this does not seem to be a satisfactory trend.

"Acceptable savings in other items of the budget could provide more funds for these two important items of technical assistance and training.

"B. Procedures followed for granting technical assistance

"The majority of Member States of the Agency are still in the preliminary stages of development regarding the use of atomic science and technology, and their knowledge and technical means have not reached the stage where they could prepare complete drafts for their research and development projects, including detailed lists of equipment and instrumentation, and they need the Agency's assistance in the preparation of their projects. Contrary to the procedure followed at the present time, the Agency should send experts to those countries to assist them in the preparation of their projects, and at the following stage send experts to assist in the execution of the projects.

"The assistance given for the execution of a project could take one of two forms. The first method would be to accept a group of trainees for specialization in a certain technique, and when those trainees have acquired the necessary skills they would be sent back to their country along with an expert in order to put the desired project into effect. A second method would consist in sending experts to the country concerned, in order to prepare a number of men for the work in question, so that after the project has been put into effect with the presence of the experts those men could carry on the work of operating the installation.

"The formalities for accepting trainees should be reduced to a minimum so that projects could be put into operation in a shorter period of time.

"C. Training grants

"Although the number of Member States of the Agency has been increasing, the number of demands for training grants has decreased since 1960, having been 649 in 1960 and 550 in 1965. [7] It would seem that a main reason for this could be sought in the slowness and the length of the procedures followed for awarding the grants.

"The number of grants awarded in 1965, which is 271 only, does not correspond to the real needs of developing countries.

"Currently the procedure followed is such that university graduates have a greater chance of obtaining the grants. It seems that it would be equally useful for developing countries to have technicians trained abroad and therefore the establishment of grants for training technical personnel would be a useful proposition to consider. These grants, while costing less to the Agency, would be comaprable in their benefit to developing countries with the grants given for the training of higher grade personnel. Technicians could also be trained in their own country by experts sent by the Agency for a limited period of time.

"D. Equipment

"Developing countries are not in general in a position to make a decision on the choice of equipment necessary for a given project and are in many cases in need of the assistance of an expert to help them in that decision. The Agency should in most cases offer such help, and should not lay down as a prerequisite to financial assistance the presentation by the applying country of a detailed list of the necessary equipment. Moreover, the money set aside for such equipment should be kept available for a longer period of time so as to permit

---

[6] Ibid., para. 23.

[7] Ibid., para. 26.

its use at the appropriate time when the Agency's experts shall have made, at the applying country's request, an estimate on the spot of the specific needs of the project at hand.

"E. Bilateral agreements

"It sometimes happens that assistance rendered by a country to another on a bilateral basis is also reported in the Agency's accounts as a debit of the receiving country; this results in eliminating bilateral assistance. Such assistance should not therefore be taken into account in two places at the same time.

"II. RESEARCH CONTRACTS

"As shown by the report of the Board of Governors ..... the repartition of credits for research contracts is not altogether to the benefit of developing countries. [8] From the total of $845 917 allotted to research, about half is distributed among 14 countries and from this half about 50%, that is 25% of the total, goes to 5 countries, the majority of which are developed countries. It would be appropriate if the present repartition of credits for research were revised and laid on a wider basis.

"Entrusting developing countries with research contracts is in fact a way of assisting those countries in their course towards progress. In this connection, research concerning problems which are specific to a given country should as far as possible be carried out in that country. The lack of equipment and specialists in a country should not be considered as an obstacle to the furtherance of the possibilities of research in that country. Experts and equipment should be sent to such a country or trainees should be accepted from it, so that the technique and knowledge for research in a given problem may be acquired by personnel of the country concerned. In this connection the creation of regional research centres would be useful, each country in a given region being entrusted with a part of the research project.

"III. PERSONNEL AND ADMINISTRATION

"The allotment of 62% of the total budget to personnel (salaries and wages, common staff costs, duty travel of staff) is, in the view of a developing country, disproportionate. These countries would expect that a larger proportion of the budget would be appropriated for assistance and the portion reserved for personnel would be reduced as far as possible.

"As regards the repartition of responsible posts in the Agency, it seems that geographical distribution has not been adequately taken into account.

"In the report of the Board of Governors to the General Conference it is seen that from among the 96 Member States of the Agency only 47 States have been admitted to have a share in the Agency's administration, [9] and this does not correspond to the principle of geographical distribution. Many of the countries who are among the founding Members of the Agency and who have regularly fulfilled their obligations have repeatedly expressed their desire of sending qualified staff for responsible posts in the Agency's administration, but up to the present they have not been successful in their efforts.

"Regarding the question of geographical distribution, the Assembly of the United Nations has three years ago adopted a revision of some of the decisions taken previously. It seems that the Agency should study those revisions and adapt its regulations to the new necessities recognized by that international body, especially as regards the composition of the Board of Governors.

---

[8] Ibid., Annex IV, Table C.

[9] Ibid., para. 230.

"IV. ADVANCED RESEARCH ACTIVITIES

"At the present time the Agency devotes a certain portion of its activities to carrying out research in advanced fields of scientific enquiry, the benefit of which goes more to advanced countries, while those countries themselves are spending far larger sums of money on research in the same fields. It seems that it would be more appropriate if the Agency, instead of engaging in such advanced research, would rather benefit from the results attained by the advanced research centres of the world, fulfil the task of centralizing the data, and transmit the results to less developed countries who are in need of them. As examples of this kind of research we could mention the items included in section (e) of paragraph 22 of the Agency's budget for 1967. [10]

"V. CONFERENCES, SEMINARS AND PANELS

"The subjects chosen for conferences, seminars and panels are not generally of a nature to be of immediate benefit to all countries and especially to the developing countries. Subjects of more immediate utility and of more ready application should be selected. Seminars for questions of regional interest should be more frequently convened.

"VI. PUBLICATIONS

"The publications of the Agency are of the greatest usefulness to all, and constitute a most valuable activity of the Agency. As regards those publications of the Agency devoted to advanced fields of scientific knowledge, however, it would seem that publications of a similar nature and of an equally high level of scientific information are to be found in sufficient number in all advanced countries. The Agency's publications could have a more general character, which could be more readily used by technical personnel in all countries. As examples of such publications we could mention the following:

Pulsed Neutron Research, 2 vols., 1965, 693 + 913 pages

Plasma Physics, 1965-1966, 778 + 649 + 1000 pages [11]

Nuclear Fusion, 1960 to 1966, 1676 pages [12]

Thermodynamics, 2 vols., 1965, 524 + 658 pages

Exchange Reactions, 1965, 416 pages

High Energy Physics and Elementary Particles, 1965, 1006 pages.

"Publications of this nature which are of utility to a specialized audience, mostly in developed countries, would better be handled on a self-supporting basis, and delivered at cost price to interested parties, an estimate being made beforehand of the demand for such publications.

---

[10] GC(X)/330.

[11] This is a combined reference to the following publications:

Plasma Physics, published in 1965 (STI/PUB/89: 649 pages); and

Plasma Physics and Controlled Nuclear Fusion Research, published in 1966 (STI/PUB/111: Vol. I, 778 pages and Vol. II, 1000 pages).

[12] This is a reference to the Journal of Plasma Physics and Thermonuclear Fusion, a quarterly publication.

"VII. EXPENSES FOR THE GENERAL CONFERENCE AND THE BOARD OF GOVERNORS

"The total in the budget for the expenses of the General Conference and the Board of Governors amounts to $595 000. [4] It is proposed to economize on these expenditures. For example, the General Conference, instead of meeting annually, could meet once every two years, and the necessary modification could be introduced in the Statute.

"Likewise, ways and means of economizing on the expenditures relating to the Board of Governors could be sought."

Israel

"16 February 1967

"1. One of the principal purposes of the Agency is to enable developing countries to utilize and apply atomic energy. The financial resources of the Agency should accordingly be devoted in the main to the fulfilment of this objective. The accent should be on technical assistance. Theoretical research should, particularly in view of the limitations of the Agency's budget, be pared down to a minimum.

"2. Indications as to some of the directions in which the scientific work of the Agency might usefully be developed, for example in hydrology or nuclear desalination for developing countries with limited financial resources, were given by Israel's delegate during discussions at the tenth session of the General Conference. [13]

"3. We suggest that the Governors examine the possibility of the award of grants for research projects to be carried out jointly by a country rich in research experience and facilities and a country less well endowed in these respects.

"4. We support the proposal made at the tenth session that sessions of the General Conference should be biennial.

"5. We also favour the proposition that existing facilities in developed countries be used rather than that budget-consuming regional centres be set up in various parts of the world. At all events, any regional centre set up or supported by the Agency should be open unconditionally to all Member States of the region.

"6. We suggest that the Governors review the regulations with regard to membership of the Board of Governors with a view to ensuring that all Member States can in practice attain membership of the Board by an equitable system of rotation.

"7. We set great store by panels, symposia and courses arranged by the Agency. Summary reports of such panels etc. should reach Member States as speedily as possible. This is one aspect of the very important role actually played by the Agency in bringing information to the attention of those who require it and in providing meeting places for the exchange of knowledge and ideas."

Italy

"18 April 1967

"The end of the first decade of the Agency's existence is a suitable occasion to undertake a thorough review of the Agency's activities, with a particular view to increasing the Agency's assistance to developing countries.

---

[13] See document GC(X)/OR. 105, paras. 8-10.

"It is, of course, desirable that the Agency's efforts in promoting the peaceful uses of atomic energy throughout the world should go hand in hand with advances in technology and meet the growing needs of the less advanced Member States.

"Given the difficulty of achieving a substantial increase in available funds, however, such a review should be confined initially to an objective and realistic appraisal of the possibilities currently open to the Agency with the modest resources at its disposal.

"The Agency's programme makes provision for almost all the forms which technical assistance can take. The Agency is doing a great deal towards meeting the needs of the developing countries, not only directly, through the provision of fellowships, equipment, experts and training courses, but also through support of studies in the fields of agriculture, medicine, radiobiology and desalting, and through promotion of other research activities in collaboration with FAO and UNESCO.

"The primary task should be to examine the priorities of the present system with a view to achieving, with the staff and resources already available, organizational improvements and a more rational approach.

"For this reason the Italian Government considers that, at the present stage, the main task of the Director General and the Secretariat is to carry out a detailed survey of the system, after consultation with other specialized organizations having a special interest in technical assistance.

"In such a review, particular attention would have to be paid to the views of the developing countries, which could make a valuable contribution to the evaluation of their needs in relation to the available resources.

"The Italian Government would, however, like to draw attention to the following points:

1. The Agency should make far greater use of its own staff in providing technical assistance in the field, thereby reducing in some cases costs attributable solely to travel expenses and special allowances;
2. With regard to the training of staff from the developing countries, the Agency should pay special attention to its research centres, bearing in mind that the theoretical instruction and the training of research workers are essential to steady industrial development, particularly in the nuclear sector;
3. Since research contracts are the most useful means of encouraging countries to exploit their own resources, future increases in funds should be concentrated mainly in this area of activity;
4. Improved distribution of the posts within the Secretariat, in closer conformity with the principle of geographic distribution, would have the advantage of providing indirect training for specialists from countries that do not as yet have highly developed nuclear research organizations of their own by giving them the opportunity to profit from the experience of the Agency staff and to engage in exchanges of views."

Japan

"J. E. 180/67 "12 January 1967

"... These comments are preliminary and our further views will be presented on future occasions.

"1. The Board of Governors in its February meeting, considering the comments submitted by the Member States, may set up a Committee of the Whole to review this problem. It is advisable to ask those Member States who have submitted comments to express their views

at the Committee meeting. The report of the Committee should be submitted to the June meeting of the Board, so that the Board may report its findings to the 11th session of the General Conference.

"2. Assistance to developing countries is one of the most important functions of the Agency, and it is appropriate to review the activities of the Agency in this field. There are, however, some other functions of the Agency, such as the exchange of scientific and technical information, establishment and administration of safety standards and of the safeguards system, which cannot be regarded solely as assistance to developing countries. However, those activities would help to maintain the Agency's scientific work, in general, at a high level and would render the assistance provided to developing countries more effective.

"3. The Agency's assistance activities should, as much as possible, be directed to the projects which are the common interest of the Member States. In connection with these projects the Agency should facilitate co-operation among the Member States concerned.

"4. The types of the Agency's assistance activities will be governed by the development of nuclear technology in the advanced countries on the one hand and the needs of nuclear technology in the developing countries on the other. In order to find out the most appropriate projects it is necessary for the Agency to obtain up-to-date information on the development of nuclear science and technology both in advanced and developing countries. In this respect the Member States should co-operate with the Agency by providing the necessary information.

"5. As nuclear science and technology develop, the field of practical application would inevitably be broadened. In order to expand assistance activities in the field of atomic energy, it is essential for the Agency to increase co-operation with the other United Nations organizations."

Jordan

On 22 December 1966 the office of the United Nations Development Programme in Jordan communicated the following:

From the Ministry of Agriculture

"Jordan joined the IAEA this year. So far, no research work using radioisotopes in agriculture has been conducted. There are no instruments available at present for carrying out such work. There are also no expert research workers capable of handling radioisotopes. However, there is an urgent need for carrying out certain research programmes, which are expected to bring a lot of progress in the agricultural field if there is access to radioisotopes. The Government of Jordan wishes to carry out the following projects in the field of agriculture if the IAEA would like to help:

1. Trace mineral nutrition

   The recent research work in this Ministry has shown that some minerals are deficient in the plant leaves in Jordan - especially zinc and manganese. The cause of this deficiency is not known. The study of the absorption of those minerals from the soil and of the leaves would be facilitated very much if radioactive minerals were used.

2. Water capacity of many sources

   There are many wells used for irrigation, whose capacity and origin can be studied easily if radioactive minerals are used. The same problem exists in the East Ghore Canal area in Jordan.

3. Mineral nutrition in animals

There is some research work which indicates the spread of zinc deficiency in human beings in the Middle East. This is expected to be the same also in farm animals and poultry. Such work can be done if radioactive materials are available.

4. Mutation production

Drought-resistant plants and vegetables are of special interest to Jordan for cultivation in the arid areas. If a cobalt-60 source is available, it will help to produce mutations in plants.

5. Chemical compounds protecting from radiation

Radiation syndrome has been shown to be alleviated by certain chemical compounds. This can be studied here also if a cobalt-60 source is available.

".....

"The IAEA can help Jordan to introduce the application of radioisotopes to develop agriculture by providing the following:

1. The instruments needed for the above-mentioned projects.
2. Training Jordanian research workers.
3. Providing technical research workers to initiate the work."

From the Ministry of Health

"Several developing countries use radioactive tools in medicine, industry and agriculture without having methods of calibration or protection, and without taking the necessary measures. Many of these countries do not think of the necessity of training medical physicists and health physicists for the radiation protection of different categories of workers using radiation and X-rays.

"It is our duty to point out that the IAEA could expand its efforts in this field, so that protective services may be set up in all countries using radiation, even if this idea did not occur to them, so that the Agency may supervise the peaceful uses of atomic energy and its favourable application in medicine for diagnostic and treatment purposes.

"Although we are expressing our opinion in a general way, we hope that the IAEA may take steps to increase its missions to advise those countries that become radiation users, especially in the field of medicine."

[The remainder of the Ministry's comments constitute requests to the Agency for technical assistance in establishing a radiation protection service to deal with environmental contamination in general, in developing Jordan's health physics services in connection with the use of X-rays in medicine and in carrying out a geological survey for nuclear source materials. These requests are being handled in the normal way.]

Korea, Republic of

"OBK-89 "27 January 1967

"1. In view of the fact that whereas the request by the developing countries for assistance, both in the form of experts and equipment, amounts to three million dollars per year and the funds available under the current budget for such a purpose can satisfy only one fifth of that total request, it is recommended that all Member States be persuaded to increase the amounts of voluntary contributions in proportion to their regular contribution share so as to enable the Agency to meet satisfactorily the above need of the developing countries.

"2. It is desirable that the Agency's assistance to the developing countries be concentrated mainly on such fields as providing equipment and granting fellowships.

"3. In order to animate the developing countries to participate more actively in the Agency's activities, it is recommended that the nationals of the developing countries should be given more opportunity in filling the vacated posts within the Agency.

"4. As mentioned in the Director General's address, the necessity for the establishment and utilization of nuclear power plants is urgently felt and widely recognized. [14] Therefore, it is very important to establish a comprehensive nuclear centre for the purpose of facilitating the early development of nuclear power plants."

Kuwait

"KWH-44879 "5 December 1966

"The Government's views and recommendations are that:

"1. There should be an increase of fellowships for university graduates and technicians of those States whose nationals wish to study nuclear science. The basic purpose of each fellowship should not be to undertake a specific piece of research, but to provide a general understanding of the practical use of atomic energy and the techniques of using radioisotopes, especially in connection with organizing radioisotope laboratories, introducing the appropriate research technology and selecting and supplying the appropriate equipment.

"2. IAEA should send experts to developing countries, either to help in organizing radioisotope centres or to develop existing centres. Such experts should stay for sufficient time; three months would be an appropriate period.

"3. IAEA should provide the necessary equipment for such centres if the State concerned cannot afford it.

"4. IAEA should take part in some of the main general atomic energy and radioisotope research activities being carried out in such States."

[14] See document GC(X)/OR. 110, para. 3.

Lebanon

"3II/No. 307/67 "3 May 1967

"I. Results obtained by the Agency in the past decade

"The ... preliminary analysis [15], which has been studied with great interest by the Lebanese Government, gives a general account of the Agency's activities during the period under review and indicates how the available funds have been used.

"In order to comply fully with the General Conference's resolution on the subject, however, it is obviously necessary to consider what results have been obtained as a result of the Agency's activities with particular reference to the economic and social progress achieved in those developing countries which have received assistance.

"Information is required in particular on the following points:

(a) What benefit has been obtained from fellowships? How is the technical efficiency of fellows and the additional training given to them reflected in the services they have rendered to their home countries?

(b) What are the results of the Agency's programme of direct technical assistance to the developing countries, evaluated in terms of specific services rendered to whole populations, e.g. increase of the gross national product, drop in mortality, technical or scientific achievements?

(c) What results have been obtained thanks to the Agency's research contract programme:

- From the standpoint of the benefits to developing countries in connection with the application of the results obtained?
- From the standpoint of the support given to research in the developing countries?

(d) To what extent have the Agency's survey activities enabled it to study the requirements of the developing countries with a view to advising them and suggesting potentially useful projects to them?

"II. Comments on the Agency's future activities

"The following remarks, which are of a general and preliminary nature, have been suggested by an examination of the ... preliminary analysis [15] and also by the comments submitted by other Member States:

1. A study of the distribution of funds reveals a disproportion between administrative costs and the cost of activities carried out directly for the benefit of Member States.

2. In view of the surveys which the Agency must carry out to study the requirements of the developing countries and the results of its work in the past, it is clear that proper planning will be needed. The Agency should maintain and keep up to date a card index for each developing country with information on economic and social questions, development projects, and the prospects of using atomic energy to hasten industrial development. The Agency should also keep an up-to-date inventory of applications of atomic energy of interest in connection with the economic development of the countries concerned.

---

[15] See Annex B.

3. The rules governing the provision of technical assistance should be relaxed so that the number of experts provided can, where necessary, be made independent of the amount of equipment given to a particular country for a particular project.

4. Information on the possibilities for using atomic energy for development purposes should be distributed routinely and should be kept constantly up to date.

5. Agency-financed research should be selected with a view to developing those applications of atomic energy which are of benefit to the developing countries. Fundamental research and research carried out, or which could be carried out, by advanced countries in their own interests should be dropped; such research is too costly and is not of direct general benefit.

6. A large part of the research funds should be appropriated to research in the developing countries. Only research of the type specified in paragraph 5 which cannot be carried out in the developing countries should be entrusted to establishments in the advanced countries.

7. Priority should be given to projects liable to be of maximum benefit to the development of the countries in which they are carried out.

"In this connection, it is important that assistance and priorities should be geared to the needs of individual countries, depending on their stage of development.

"The following fields of application are particularly important:

- Agriculture
- Water supply
- Power generation
- Public health and hygiene
- Industrial applications
- The promotion of research."

Madagascar

"No. 0366 AE/OI/AIEA/105 "1 March 1967

"....."

"The Radioisotope Laboratory in Madagascar is already receiving considerable assistance from the International Atomic Energy Agency in the form of two research contracts:

- one dealing with radio-agronomy,
- the other dealing with nuclear medicine.

"These contracts are used mainly for the remuneration of technical personnel required to carry out the Laboratory's research programme.

"The Government of the Malagasy Republic would like both these annual contracts to be renewed [16].

---

[16] In so far as this communication constitutes requests for further help and support from the Agency, the standard procedures will be applied.

"Madagascar also plans to undertake research into variuos other applications of nuclear energy. As these projects are not likely to produce any immediate economic benefit, however, they will have to be financed by foreign organizations, and by the IAEA in particular, for a few years at least.

"Effective Agency assistance is also needed to enable the Laboratory to send a representative to attend an international conference of experts, which it would otherwise be unable to do, owing to the distance involved.

"To sum up, the Government of the Malagasy Republic, in the desire to enhance the utility of its Radioisotope Laboratory, could not but welcome continued assistance from the Agency on an increased scale."

"0821/AE/OI/AIEA/105 "29 April 1967

"... the Madagascar Institute for Agronomical Research (IRAM) would also be a suitable candidate for Agency assistance in view of the scope of the work it is at present carrying out in connection with fertilizer experiments on the main crops of our country.

"The Institute would be particularly interested in making use of labelled nitrogen (^{15}N) if the Agency could supply it with ^{15}N-labelled fertilizers and could also carry out the necessary mass spectrometry analyses of the ^{15}N in its Vienna laboratory.

"The isotope studies could include the continuation of earlier work (carried out with the help of the IAEA) on the nitrogen supply of rice, and could be extended to other plants as necessary.

"The Institute would also be interested in using ^{15}N to study the problem of how organic material is involved in the nitrogen supply of plants and in particular of rice.

"I should also like to draw your attention to the fact that Madagascar would be extremely interested in participating in future in any co-ordinated programme on the use of isotopes in rice cultivation. Even if such a programme were established on a regional basis with the countries of South East Asia, Madagascar would be anxious to take part since its rice-growing problems are identical to those of South East Asian countries, and a solution to these problems based on the use of isotopes would be of real benefit to it."

Monaco

"No. 19 "9 December 1966

"... the Government of the Principality has so far only been able to assist the work of the Laboratories of Applied Radioactivity and Marine Radioactivity in the Oceanographic Museum.

"It is in this field and not in that of nuclear reactor techniques that the Government of the Principality will be able to make its small contribution to the furtherance of the Agency's activities.

"Expansion of the International Laboratory of Marine Radioactivity, at present directed by Dr. Joseph, will undoubtedly speed the studies and research which are capable of leading to acceptable general solutions to the problem of atomic waste disposal into the sea. At the same time these solutions should not be too expensive, so as not to increase appreciably the cost of nuclear electricity.

"The Monaco research centre could give the benefit of its expert advice to any diplomatic conference that was convened to lay down international regulations for the disposal of atomic waste into the oceans and seas.

"This specialized Agency centre could then be made responsible for co-ordinating the application of these regulations by the various States that signed the appropriate Convention and it would also continue its study and research with a view to improving still further on the initial solutions adopted."

New Zealand

"PM 121/6/24 "14 February 1967

"....

"I wish to inform you that the New Zealand Government does not have any comments or recommendations to submit relating to the review."

Nigeria

"No. Fh/11/31 "29 December 1966

"... Nigeria has no special comments to make but to support the resolution."

Norway

"Jnr 2230/66 "20 December 1966

"The Agency's assistance to developing countries is financed by voluntary contributions from member countries and by the United Nations Organization as part of its programme for technical assistance (UNDP/TA). However, the voluntary contributions to the Operational Budget have never reached the Agency's target amount. An improvement in this situation could be obtained through a campaign for voluntary contributions from countries not contributing, or contributing less than their percentage, [17] to the Operational Budget. An increase in the contributions from these members would, of course, lead to an equal increase in the 'matching contribution' of the United States towards the Operational Budget.

"Increased financial support through UNDP/TA should not be excluded if the developing countries themselves regard the application of atomic energy in their areas as a high priority need. If a greater part of United Nations funds are transferred to the IAEA for the development of atomic energy in developing countries, it must be expected, however, that the amount available for other development projects will be reduced correspondingly. Thus, the priority scale within the relevant United Nations bodies for the different types of assistance to developing countries must be borne in mind.

"As to the desire among a number of developing countries for receiving more equipment from the IAEA, it seems obvious that this cannot be dealt with within the existing budgets of the Agency. The Agency might be able to procure the needed equipment through ordinary commercial channels, financed by the Governments of the respective Member States through long-term loans. Such loans, however, will have to compete with other long-term credits to developing countries and will therefore depend on the priority given to these deliveries by both the recipient and the lending country.

"In conclusion, an expansion in the Agency's programme for technical assistance seems to be contingent upon the developing countries' own scale of preference for the various aid projects. It follows that a chief task must be to seek information on the developing countries' own evaluation of atomic energy programmes as compared to other development

[17] See the General Conference's Resolution GC(V)/RES/100, para. 2.

needs in their areas. A high degree of preference for nuclear projects would undoubtedly be of considerable support to the IAEA in its efforts to expand its programme for technical assistance."

Pakistan

"IA- 11 (15)/66 "7 January 1967

"1. More funds should be provided for equipment and fellowships. Developing countries, which have made progress in the nuclear field, should be granted equipment on the basis of research programmes and the provision of equipment should not be tied down to that of experts.

"2. A constant survey should be made on the requirement of nuclear power for the developing countries and active assistance extended in securing capital funds from international banks on easier terms.

"3. IAEA should establish stronger relations with other specialized agencies of the United Nations, especially UNESCO and WHO, in helping the developing countries to raise the standard of scientific education.

"4. Promotion of pilot plant studies in the developing countries in specific fields.

"5. Establishment of international institutes and assistance to national institutes in the developing countries.

"6. Increased allocation of funds for research contracts in the developing countries.

"7. Promotion of active collaboration between the scientists in the developed and developing countries in atomic energy fields.

"8. Provision of travel expenses and daily allowances for participants from the developing countries in symposia, seminars etc., sponsored by IAEA.

"9. Allocation of more funds for the exchange programme.

"10. Financing of short-term assignment of highly qualified persons as experts in increased numbers for the benefit of the developing countries.

"11. Allocation of funds for travel grants to qualified scientists of the developing countries for short-term visits to scientific institutions in the developed countries."

Philippines

Telegram "14 December 1966

"FIRST STABILIZATION OF FINANCIAL RESOURCES REQUIRED TO SUPPORT AGENCY'S TECHNICAL ACTIVITIES; IF NECESSARY STATUTE OR FINANCIAL REGULATIONS BE AMENDED SO THAT LEVEL OF CONTRIBUTIONS OF MEMBER STATES SAME AS THEIR PERCENTAGE ASSESSMENT FOR REGULAR BUDGET INSTEAD OF VOLUNTARY CONTRIBUTIONS SECOND LIBERALIZATION OF AGENCY OR UNITED NATIONS POLICIES TO ALLOW ALLOCATION OF TECHNICAL ASSISTANCE FUNDS FOR EQUIPMENT EVEN WITHOUT USUAL PROVISION FOR EXPERTS THIRD PROMOTION OF MULTILATERAL AGREEMENTS LEADING TO ESTABLISHMENT REGIONAL RESEARCH AND TRAINING CENTRES IN VARIOUS ATOMIC ENERGY ASPECTS IN GEOGRAPHICAL AREAS OF DEVELOPING COUNTRIES AND FOURTH FURTHER EXPANSION OF AGENCY'S RESEARCH CONTRACT PROGRAMME TO DEVELOPING COUNTRIES"

Romania

"22 March 1967

".....

"The Romanian authorities appreciate the Secretariat's efforts to make the best possible use of the resources available to the Agency for its technical assistance programme. The documents submitted to the Technical Assistance Committee and the Board of Governors have always been characterized by their careful presentation and drafts prepared by the Secretariat have, with few exceptions, been unanimously adopted.

"The Romanian authorities also note that it has been the constant endeavour of the Secretariat to improve the machinery for implementing technical assistance projects and steadily to increase their effectiveness.

"In response to the letter sent by the Agency [18] and also to the resolution adopted by the Board of Governors at its meetings [in February 1967], the Romanian authorities would like to make a number of suggestions which, in their view, can contribute to the joint efforts being made to increase continuously the effectiveness of the Agency's work in this field.

"1. The possibility should be studied of sponsoring jointly with ILO continuing courses for training technicians in the peaceful uses of atomic energy, particularly in the field of nuclear power. If it should prove impossible to implement this idea at the present time because of lack of funds, the Agency should have standing arrangements for sending fellows to attend national courses of a similar nature organized by Members of the Agency.

"2. A publication should be issued periodically, listing applied science projects being carried out in the advanced countries and giving information on the results obtained, the methods employed, the organization and equipment of the individual laboratories etc.

"3. Manuals designed for technicians should be published on questions of nuclear power, isotope applications and the use of radiation.

"4. The supply of equipment should no longer be made to depend on the assignment of experts in connection with technical assistance projects; in cases where experts are requested by the countries concerned, the minimum tour of duty should be reduced from three months to one month. The need for short-term experts could be met by sending experts already employed in the Secretariat; in this way the expenditure incurred would not come against the technical assistance budget.

"5. More attention should be paid to the utilization of voluntary contributions made by Member States in the form of equipment or fellowships: the time required to transfer equipment to the country concerned should be reduced and maximum use should be made of Type II fellowships. In this connection it would be useful if the Agency were to inform Member States periodically of the current situation with regard to available Type II fellowships."

South Africa

"9 December 1966

"... I am directed to reaffirm my Government's support for this review. It is only by such critical analysis of past activities and their results that faulty planning and implementation can be identified, and thereby rectified in the formulation of future programmes.

---

[18] The invitation addressed to Governments pursuant to the General Conference's Resolution GC(X)/RES/217, para. 4.

The end of the first decade of the Agency's existence is an appropriate point in time to carry out this exercise.

"It is noted that the first operative paragraph of the resolution concerned defines the purpose of this review as

> '... to find ways and means to increase [the Agency's] assistance to developing countries'.

It is to be hoped that this phrase will be interpreted in the widest sense, since all the Agency's activities are designed to benefit the Member States (including the developing countries) and all could be evaluated with advantage in the spirit of the preamble to this resolution. Indeed if any one aspect of these activities were to be assessed in isolation, there would be a grave risk of creating an imbalance in the Agency's programme as a whole.

"The value of this review will depend to a very large extent upon the adequacy of the preparatory stages. Unless we are very clear in our minds about what precisely we propose to achieve and how we intend to set about it, the whole operation could prove fruitless - or at least a good deal less fruitful than one would hope and expect it to be. It is accordingly suggested that, during its meetings in February, the Board of Governors might consider it appropriate to define the precise objectives of this review, to establish the means whereby it will be conducted, and to set in motion those operations which require immediate action. The problems and considerations which might thus engage the attention of the Board in February are discussed in the following paragraphs.

"An evaluation must by definition require a comparison with some clearly defined yardstick. It is thus essential that the Board should define as precisely as possible what yardstick it considers appropriate in this instance. A possible definition might be the degree to which the national nuclear development programmes of Member States - and particularly of developing countries - have benefited, or have failed to benefit, from Agency projects, and the degree to which the Agency has fulfilled its potential as a catalyst in nuclear development generally, as envisaged in Article II of the Statute. Once this yardstick has been agreed upon, the Board will be in a position to decide what questions the review is required to answer and what terms of reference are necessary to that end. These terms of reference should be sufficiently precise to produce the information required, and at the same time sufficiently flexible to allow the survey to cover all the aspects which may be pertinent to the central theme.

"No Member State can speak with as much authority on ways and means of improving and increasing the Agency's assistance as the Director General and those officers of the Secretariat who have been in charge of technical assistance activities in the past decade. As a first step therefore, it is suggested that the Director General be requested to prepare a detailed evaluation of the existing system with recommendations as to how it might be improved to meet the objectives of the General Conference's resolution. This evaluation might also take into account, as far as may be practicable, the substantive comments received by the Director General in response to his present - and possible future - enquiries.

"The assistance of the Director General and his staff will also be required to assemble the data required for implementing this review. Much of these data is already contained in the Agency's published records, but it may be necessary to re-issue them in consolidated form. It would save time if the Director General could be provided in advance with guidance as to what would be needed in this regard.

"It may also be necessary to seek the co-operation of Member States in collating evidence of the practical effects and influence of past Agency projects upon their national development in the nuclear context. If so, it would be wise to decide in advance what particulars would be helpful and to set about gathering them without delay.

"The Agency's activities overlap in some respects with those of the specialized agencies, and information might also be sought from them to assess the adequacy of inter-organizational liaison and co-operation. Here too, early action is to be recommended.

"A decision will be required from the Board as to the type of machinery which should be established to carry out a review of this nature. It seems probable that the Board would not itself be in a position to undertake the survey without assistance. The supplementary studies which would be required - and which might be fairly protracted - could be undertaken in various ways. For example the Board might consider establishing a Committee of the Whole for this purpose. There might also be advantage in appointing a small Advisory Committee, composed of no more than three to five experts, selected in their personal capacity by virtue of their eminence in some specific fields of specialization such as finance, radioisotope application, power reactors and the exploration for and extraction of nuclear materials. If this suggestion is acceptable, it is recommended that the Secretariat be represented at all the meetings of this Committee as a full member. Serious consideration should also be given to the advantages of appointing external consultants for advice on the Agency's future activities.

"As regards the manner in which the reports of these bodies might be co-ordinated, it is proposed that the evaluation prepared by the Director General and the Secretariat be submitted to the Advisory Committee, which in turn would report to the Committee of the Whole. The comments and recommendations of the Committee of the Whole would then be submitted to the Board of Governors for final consideration."

Sweden

"4 January 1967

"The Agency's assistance to developing countries is financed mainly by voluntary contributions from Member States to the General Fund. These contributions amount to only about two-thirds of the target sum of $2 million set by the Agency. Even if special contributions and miscellaneous income are taken into account, the receipts of the General Fund fail to reach this level. In the opinion of the Swedish Government, this method of financing provides a poor basis for long-term planning of technical assistance. Even if some improvement were obtained by persuading more Member States to contribute according to their full percentage assessments for the Regular Budget [17], an increased dependence on voluntary contributions should in principle be avoided.

"Funds are also made available to the Agency under UNDP/TA. The total allocation of UNDP/TA funds to the Agency for 1967 and 1968 is $2.2 million. A future increase of financial support to the Agency under the UNDP must be considered against the general background of the needs and priorities of the developing countries. This is a matter for the developing countries' own evaluation.

"In addition to these two forms of multilateral assistance, individual Member States may give bilateral assistance - financial or in kind - to specific IAEA projects. According to Swedish experience in other fields, combined multilateral and bilateral projects of this kind may produce excellent results. Although the needs of the developing countries themselves should be given prime consideration in the choice of such projects, the resources and special experiences of the donor country may also be taken into account.

"Thus in the case of Sweden, reference can be made to a relatively important potential in the atomic energy field and in the energy field in general, principally in respect of hydro-electric power. Future Swedish contributions might, for example, include general studies of the energy supply problems in a developing country. Other fields within the scope of the Agency's activities might be geological surveys, studies in the suitable utilization of research facilities and in medical, agricultural and other applications of atomic energy techniques.

"Although the funds available to the Swedish International Development Authority (SIDA) for bilateral technical assistance for the fiscal years 1966/67 and 1967/68 have already been reserved for other purposes, the Swedish Government will consider any suggestion from the Agency for bilateral assistance to suitable IAEA projects later. Meanwhile, SIDA will endeavour to increase recruitment of experts for the IAEA.

"As to scholarships, there have been certain difficulties in finding suitable applicants. Of the two and four scholarships offered by SIDA to the IAEA for the fiscal years 1964/65 and 1965/66 respectively, only the two reserved for the Atomic Energy Commission of Pakistan have been used. For the current fiscal year, four scholarships are available and two more may be anticipated."

Turkey

"No. 301/79 "29 December 1966

"To-day it has become a necessity in the assistance programme of the Agency to give more emphasis to the needs of the developing countries. Considering the differences in the nature and particular needs of the developing countries, as well as the budgetary possibilities of the Agency, this assistance should be in an order of priority and within a long-term programme. Such a programme presupposes a good knowledge of the resources and needs of the said countries. With this consideration in mind, the Agency should encourage developing countries to elaborate studies covering their long-term nuclear energy needs and, in the light of an objective evaluation of these studies, its assistance programme must be reviewed. By following this course, the Agency, while taking preparatory steps to help the progress of the countries which are at the early stage in the field of atomic energy, must at the same time support the development of the Member States which have achieved a certain progress but are not at the same level as the advanced countries.

"The Agency, in preparing its programme, should direct its activities particularly to the fields which are of practical benefit for the developing countries. Since the economies of the developing countries are mostly based upon agriculture, the said activities should be channelled specially towards agriculture. The Agency should decrease theoretical studies and researches, which are actually carried out by the advanced countries, and act as an intermediary to help developing countries to take advantage of the results obtained by the advanced countries.

"In particular the financing of research which is not practically beneficial for the developing countries should be taken out from the Operational Budget and transferred to the Regular Budget.

"The Agency should make more efforts to obtain necessary funds to meet the equipment and material requests of developing countries. In this connection, it seems necessary to point out the inconvenience of the close dependence of equipment and material assistance on the expert services of the Agency. It is a fact that some Member States which may not need the services of foreign experts for certain projects may be in great need of material and equipment. But they are obliged to request experts in order to obtain needed equipment because of the above-mentioned dependence. An unnecessary financial burden on the Agency's budget could be avoided by separating such requests for experts and equipment.

"On the other hand, in meeting requests of developing countries for foreign experts, it would be preferable to resort to the available expert services existing in other developing countries. It is believed that, instead of providing expert services to the developing countries, more emphasis should be given to the training of their scientists in the advanced countries. As a matter of fact, a foreign expert, due to the insufficiency of his knowledge of the real needs of the developing countries generally, is useful for a restricted number of projects and for the training of scientists dealing with these projects; whereas a trained local scientist becomes more useful for a longer period and for training a larger number of scientists in his country.

"On the training of scientists, shortness of the duration of fellowships awarded has long been a matter of complaint. In fact, fellowships of seven to eight months do not at all give the expected results. The duration of fellowships must be at least one year, and the Agency should see to it that the fellowship-holder is sent to a country where the scientific language spoken is the one the fellow speaks. This will avoid a great loss of time for initial language studies.

"The Agency, in examining the fields of studies for fellowships, must take into consideration that the proposed field is of predominant interest for the nominating country and must abstain from objecting to award the fellowship in the requested field.

"Selection of the locations for scientific conferences convened by the Agency is another important point for consideration. These conferences must be held in the developing country if it has a particular interest in the subject which is to be taken up by the conference. This will help to increase the efficiency of such conferences and also reduce the participation-expenses of these countries. On the other hand, as is known, because of their financial difficulties, scientists of developing countries are not always able to participate in sufficient numbers in some of these conferences. In such cases, particularly when the Agency itself feels the necessity and usefulness of the participation of certain scientists, it must provide for their participation by partly defraying their travel and other expenses.

"The research contract programme must be arranged mostly in accordance with the needs of the developing countries and contracts should preferably be concluded with the scientists of these countries. At the same time the research projects should be undertaken in the laboratories of developing countries capable of doing such research. The funds allocated for research contracts should be paid to the scientists concerned in order to enable them to dispose of the funds in the most efficient way.

"In order to increase its financial means as well as to avoid duplication of effort, the Agency should collaborate to a larger extent with other international organizations and proceed to establish joint-divisions with them.

"The Agency should draw the attention of Member States to the desirability of taking the necessary steps in order to profit from the possibilities of the United Nations Special Fund.

"To ensure the continuity of projects set in operation, the Agency should proceed to establish related laboratories in the countries concerned.

"In order to diminish expenses, the Agency should provide the services of short-time experts from its own scientific staff.

"The last point to comment on is that the Agency should give more consideration to geographical distribution, rather than to the financial contributions of Member States, in selecting the Secretariat's staff. In fact, an increase in the number of officials from developing countries will contribute to a large extent to the creation in the Agency of a more understanding and favourable atmosphere vis-à-vis these countries."

Union of Soviet Socialist Republics

"No. 100 "17 February 1967

"....."

"The Soviet Union attaches great importance to the provision of technical assistance to developing countries under the auspices of the Agency. Accordingly, at the tenth regular

session of the General Conference, it announced a substantial increase in its contribution to the General Fund [19] with a view to rendering more extensive assistance to the developing countries. The Soviet Union considers that the proposals of the socialist countries to provide the developing countries with radiological equipment for medical centres constitute an important contribution to the technical assistance provided by the Agency to such countries, and, in the near future, the Soviet Union will supply such equipment, as a voluntary contribution to the General Fund, to Morocco, Pakistan, Iraq and Burma.

"The Soviet Union considers that certain work of value to developing countries is being carried out, through the Agency, under its annual programmes and technical assistance programme. We believe that in carrying out the review of the Agency's activities pursuant to the relevant resolution adopted by the General Conference at its tenth regular session [3], an effort must be made to analyse the Agency's work under those two programmes and to find ways and means of meeting, to an increased extent, the needs and requests of developing countries.

"The Secretariat has facilitated the Board's task by preparing a factual analysis of all the Agency's activities from the point of view of the extent to which its programme is of direct interest to developing countries [20]. The preparation of the review should also of course be based on the views and comments of developing countries. We would expect these countries to indicate whether the Agency's present programmes and projects have any positive effect on their national atomic programmes and to state their wishes regarding the possible reorientation of programmes; these wishes should be taken into account in future. We would also expect developing countries to state their views regarding the more rational use of the General Fund, which is made up of voluntary contributions. In preparing the review, developing countries should be given ample opportunity to express their views verbally and in writing. We share the view that a committee consisting of all the Members of the Board should be set up to prepare the review. Naturally, we attach great importance to consultation with the Director General on questions concerning the implementation of the appropriate decisions, as envisaged in the resolution itself.

"We should also like to make the following comments on the substance of the problem.

"In preparing the review it should be borne in mind that the Agency is an organization whose aim is to promote extensive international co-operation in the peaceful uses of atomic energy and hence it should, to the fullest possible extent, take into account the interests of all States taking part in its activities.

"The Soviet Union strongly supports the view that the Agency should base its programmes and activities relating to the provision of assistance to developing countries on a realistic assessment of its financial resources. Thus, if it should prove to be desirable in the interests of developing countries to place increased emphasis on any particular activities, this should not be done by increasing the budget but through appropriate redistribution of funds and the rational use of the General Fund in accordance with Article III. B. 3 of the Statute. Some programmes, such as the programme of scientific and technical meetings, could also be more effectively carried out; this could be done by holding some of the meetings of special interest to developing countries in such countries. This does not mean of course that the Agency should not try to obtain additional funds from external sources, particularly under UNDP and through co-operation with specialized agencies (UNESCO, WHO, FAO, UNIDO, etc.). It is perfectly clear that the Agency's activities relating, for example, to medicine and agriculture, research contracts or symposia on medical and agricultural subjects, should be jointly financed by the Agency, WHO and FAO. The activities relating to training should, as a rule, be jointly financed by the Agency and UNESCO. That would release funds which could be used to promote

---

[19] See document GC(X)/340/Rev. 2.

[20] See Annex B.

the peaceful uses of nuclear science and technology and to study the problems with which the Agency alone is concerned, including problems whose solution is of primary interest to developing countries.

"The subjects of research contracts should be chosen with a view to solving problems in applied science and technology relating to the peaceful uses of atomic energy, in which all Member States are interested.

"With regard to increasing the funds available for technical assistance, which consist of voluntary contributions, it is doubtful whether it would be advisable to recommend that any decisions should be taken which would require an increase in such contributions. The amount of voluntary contributions, if they are in fact to remain voluntary, should be decided by the countries themselves. Moreover, the Agency could make more effective use of these funds for providing assistance to developing countries. It could do so firstly by making more rational use of the available resources. The Agency should accommodate the developing countries by increasing the proportion of technical assistance funds spent on equipment at the expense of the funds spent on experts. Secondly, Member States should be encouraged to contribute not only in the form of currency but also in the form of equipment, material and fellowships and by making available to scientists from developing countries opportunities for working on specific subjects, using appropriate equipment and facilities in advanced countries. Such contributions and co-operation should be regarded as voluntary contributions to the General Fund. In this connection, mention must be made of the improper practice whereby the equipment offered some time ago by the Soviet Union and other socialist countries for the establishment of medical radiological centres in the developing countries was not considered as technical assistance provided by the Agency.

"The Soviet Union feels it must express concern at the Secretariat's tendency to reduce the proportion of equipment supplied to recipient countries, which are constantly pressing for the redistribution of resources in favour of equipment.

"At the request of developing countries the Agency could provide advice, calling on experts from advanced countries, in carrying out regional projects concerning the peaceful uses of atomic energy which have been approved by the Board. With the approval of the Board the Agency might request individual advanced countries to co-operate in various ways or to assist developing countries in solving concrete problems on the basis of bilateral agreements between the advanced and developing countries concerned.

"In conclusion, I wish to point out that the Soviet Union, as in the past, cannot agree that the Agency should continue to provide technical assistance to the puppet Governments of Taiwan, South Korea and South Viet-Nam."

United Arab Republic

"823 "12 December 1966

"1. The following are the main reasons why we consider it important and necessary to increase the volume of assistance rendered through the Agency to the developing countries in particular, to review the main role of the Agency in promoting the peaceful uses of atomic energy around the world, up to the level and standard which can reflect the dynamic and progressive evolution of technology and meet the growing needs of the Member States of the Agency, so that they may benefit in the best possible manner and at the highest level technologically and economically which would be practically useful and beneficial to them; and in the meantime to mobilize all possible international means of co-operation and co-ordination through the Agency in the service of both developed and developing countries.

"2. The Agency should explore, and encourage the increase of, the technological and other services and aid which the developed countries would be willing to place at the Agency's disposal to be used in assisting developing countries to extend the peaceful uses of atomic

energy; in other words to explore the volume and extent to which the developed countries can assist in building up the technical assistance programme of the Agency to the highest possible level, both technically and in carrying out projects, in addition to what has been classically done under the Agency's programme of technical assistance up till now. This exploration, together with the invitation to Member States to contribute more to the Agency, may very well provide new resources for the Agency's advanced programmes; in such a case the Agency should respond by providing the developing countries with the type and volume of assistance which the developed countries make available. This might require the Director General of the Agency to use his good offices through the Board of Governors or directly with all Member States of the Agency. These additional voluntary contributions could be in equipment or finance or other services.

"3. The following recommendations are based on the fact that we are convinced of the need to improve the type of assistance in which the Agency had been engaged in the past ten years in order to accomplish these two main objectives:

(a) The technical assistance services should meet the standard of technology already established in developed Member States in order that the developing Member States may be helped to advance their technology in using atomic energy for peace; and

(b) The main efforts of the Agency's personnel and capability should be directed towards the realization of projects economically useful to Member States, areas and continents. In doing so the Agency would be contributing to the practical welfare of mankind and to the practical uses of atomic energy for peace.

In trying to accomplish these two goals it will be necessary for the Agency to increase the co-operation with the United Nations and its family as one of the means of seeking more resources to enable the Agency to fulfil its task.

"4. The Director General might find it necessary to plan for a campaign aimed at bringing the Agency's potentialities to the attention and stimulating the interest of different organs of government in Member States, such as technological, financial and planning ministries or boards in addition to its classical relations with atomic energy establishments and through their attraction and growing interest the Agency might receive in return more support for its programmes and in fulfilling its duties. It is clear to all of us that the use of atomic energy for peace has extended beyond the circles of atomic energy establishments as such. Therefore, it is worth while drawing the attention of those new circles that could benefit from the Agency's activities, thus getting their support for future projects and in all likelihood getting their additional financial support.

"5. Noting that the following would be the principal lines for the consideration of the Agency; noting that the Agency will be the driving force to implement projects of higher standards and an advanced nature in co-operation with Member States; and noting that the Agency's programme of technical assistance has up to now achieved quite a remarkable success in helping many States to build up their scientific basis through training, panels, symposia and the dissemination of information, we strongly believe that the natural step forward after this achievement should be the development of further scientific capabilities as such to enable the developing countries to use the scientific basis they have already required. In relation to the following recommendations it is important to mention that most of the work required for the elaboration of a revised programme of technical assistance must be carried out by the efficient organs of the Agency which are capable of assembling and analysing the necessary information and preparatory data to form the basis on which the Board of Governors would finalize the type of programmes and projects in which the Agency can be engaged in the future.

"Technical assistance

"6. During the last ten years the technical assistance has been directed towards the establishment of the scientific basis in the developing countries. However, the next stage necessitates that technical assistance should be modified in order to meet the requirements of the developing countries to strengthen their scientific cadres and to make full use of what has been achieved in nuclear power, nuclear material exploration and nuclear industrialization. We suggest the following points to fulfil such goals:

(a) A balance should be achieved between the various aspects of technical assistance given by the Agency which includes fellowships, experts and equipment. It has been noticed that equipment constitutes about 20% of the total value of technical assistance. This should be increased considerably in the next stage of the Agency's projects, in order to make better use of the fellows trained through the Agency and of the experts which the Agency sends to the developing countries;

(b) Technical assistance should be generally expanded towards the technical and production aspects, particularly in the subjects of nuclear power reactors, desalination and the exploration for nuclear materials and their development concentration and production. It has been noted also that the proportion of all aspects of nuclear technology constitutes only about 20% of the total, while it reaches about 50% in the case of isotopes and their applications. This latter proportion is very high for the next stage of the Agency's activities due to the availability of considerable numbers of specialists in isotopes and their applications in many developing countries, and because of the increasing need of the developing countries for other specializations, notably in the technological and production fields. The application of nuclear energy to projects of a productive nature in the developing countries should start in industry and agriculture; in the latter field there should be projects to achieve wider regional and international benefits - such as pest control as an integrated project. The United Arab Republic is ready to be the host country in the execution of any number of programmes related to this matter for direct utilization of these techniques in the United Arab Republic or in the area or in the continent. This we certainly continue to recommend;

(c) Whenever possible an integration of the various components of technical assistance should be achieved. Member States may be encouraged to make comprehensive requests for technical assistance consisting of experts, fellowships and equipment so that a greater benefit may be reached through it; and in that case the Agency can study the collective results achieved in order to evaluate the practical benefits gained from the project as a whole; and

(d) The Agency should look seriously into the possibility of transferring a good deal of theoretical training to the specialized agencies of the United Nations. In this respect the Agency may define the scientific fields for its own training programme, studying at the same time the training possibilities of the specialized agencies in theoretical subjects, reach an agreement with them, and then recommend Member States to send their applications for training in the fields concerned to the specialized agencies directly. In this case the Agency will direct a greater proportion of its financial resources towards training in applied atomic sciences.

"Research contracts

"7. Although the Agency has made a considerable effort in this field, the benefit gained by the developing countries from this effort could have been more substantial. It is important that a study be made of the Agency's contracts during the previous period; it may include the general trends of those contracts and an evaluation of the results achieved, especially in so far as they may be applied to solve the problems of the developing countries. Member States would make use of this study to give definite recommendations regarding the development of the Agency's activities in this field. Until the study is completed, we propose the following points for consideration:

(a) More research contracts should be given to developing countries than in the previous period, to solve local or regional problems. Furthermore, the results achieved from research contracts in the developed countries should be disseminated and applied in other Member States through the Agency;

(b) Special attention and priority should be given to problems of interest to the developing countries, whether of continental or regional significance. These are problems of direct economic importance which could be tackled by the use of atomic sciences, and the solution of which accordingly could be described as productive projects, such as pest control for important agricultural products including cotton and fruits, problems involving research in hydrology and desalination, and the long-term requirements of the developing countries for nuclear energy; and

(c) The developing countries and economically developing areas should take part on a regular basis in drawing up the policy for the award of research contracts, and the allocation of these contracts to them should be increased.

"Scientific meetings (panels, symposia and working groups)

"8. The Agency should concentrate its efforts on scientific meetings which tackle problems of technology and economics of nuclear power, desalination, nuclear materials and nuclear industrialization, as meetings on these subjects are of practical help to the developing countries, as well as on regional problems of interest to the developing countries. More scientific meetings should be held in the areas most able to make use of the work done instead of holding the majority of meetings at the Agency's headquarters.

"Proposed new activities for the coming stage

"9. In addition to the development of the above-mentioned programmes, it is important to proceed along new lines aiming at the Agency's initiation of or participation in projects to help the developing countries with the applied and industrial fields of nuclear energy. Our suggestions in this respect are the following:

(a) The Agency should promote and take part in projects to establish one or more power reactor centres which would primarily serve as institutes for training specialists in the diversified branches of constructing and running reactors, fuel fabrication and the industrialization of reactor materials. The advantage of such centres would be that they offer integrated training, thus eliminating the present need to send specialists to different parts of the world, while still not covering all the fields. These centres would accordingly be places for exchanging experience between the countries manufacturing reactors and those which are looking forward to building such reactors. These centres could be set up through the Agency's collaboration with the Member States which possess the technical ability to build reactors and those Member States which are interested in establishing such centres, it being understood

that once the Board of Governors has authorized the Agency to enter this high-level practical field, the initiative would come either from an area or a Member State, or directly from the Agency itself if it were to deem it practically useful to concentrate its training programmes in such a reactor complex. There are many parts of the world which would be ideal for such a project, which would achieve two essential goals:

(i) Large-scale technical services and experience in the peaceful application of atomic energy would be given to Member States, with special reference to the use of atomic energy to promote the economy and power production in the developing Member States. In so doing the Agency would be fulfilling its main task in this field to the degree which will certainly be required in the coming decade; and

(ii) The Agency would strengthen its international status through its direct supervision of such centres, where it would apply its rules to make sure that atomic energy is used for peaceful purposes;

This project could accordingly be one of the practical contributions to world peace, and bridge the gap between the Member States manufacturing reactors and those willing to build reactors. These proposed centres should be established in the regions and continents which need these services, according to the progress they have made in the atomic field (tailor-made projects). The Agency should be encouraged to take part in these projects in collaboration with the interested countries, regions or continents, and might act as an intermediary between the developed and the developing countries in this respect; and

(b) The Agency should promote and take part in regional or continental centres for the application of nuclear methods in prospecting for mineral raw materials and water resources. We suggest that the first such centre should be established in the United Arab Republic or in North Africa, which is one of the largest semi-arid regions in the world and needs mineral raw materials and water for its development. A centre of the desalination reactor institute type could also be established in an advanced country to render similar services to all Member States. In this case, the proposed centre would be put at the disposal, through the Agency, of the training programmes of the interested countries. The contribution of the Agency to such project or projects could be looked upon as a practical contribution to the solution of the world's need for fresh water, which is one of the serious problems of humanity now and will be for years to come.

"Financing

"10. Large financial resources should be available to the Agency to develop its programmes. For this reason it is important to look into new financial resources. We propose the following to achieve this aim:

(a) The United Arab Republic has previously declared its readiness to increase its voluntary contribution to the Agency if all Member States accept the principle of increased voluntary contributions as one way of solving the financial problems of the Agency. We feel it necessary to take a practical step towards convincing Member States to accept this principle after the necessary decision has been taken by the Board of Governors;

(b) The Agency should hurry to seek financial support from the United Nations within the framework of the Development Decade. The Agency could use the financial resources of this programme for projects of a wider scope than it can undertake with its existing financial means. Such new financial resources would certainly assist in establishing research centres along the previously proposed lines. The Secretariat of the Agency should submit to the Board of Governors a report on the potentialities of these financial resources. We shall be able from our side to give more details about this matter at a later stage;

(c) Closer collaboration should be established between the Agency and the specialized agencies, so that the latter would assist the Agency within the scope of their specialization. The Board of Governors might need a report on these potentialities from the Secretariat. It might also need to give guidelines to the Secretariat as to how to proceed in its efforts to achieve such closer collaboration; and

(d) The Director General of the Agency might be able to use his good offices to get financial support from non-governmental organizations which are willing to give it. These contributions should be used to support the previously mentioned regional and new big-scale projects. These contributions need not necessarily be considered as a part of the budget of the Agency.

"The structure of the Agency's Secretariat

"11. In addition to what has been recommended at previous meetings and in particular at the tenth regular session of the General Conference of the Agency, we recommend that the Director General of the Agency should, over a period of time, encourage the equitable representation of the developing countries in the Agency's Secretariat in general, and in particular in the posts which mostly serve the cause of promoting the uses of atomic energy for peace."

United Kingdom of Great Britain and Northern Ireland

"(1245) "28 December 1966

"... the United Kingdom has re-examined the Long-Term Programme for the Agency's Activities [21], which was endorsed by the General Conference at its seventh regular session [22] and which was intended to guide the Agency's work from 1965 onwards. In general, the United Kingdom is satisfied both with this Programme, and with the manner in which the Secretariat is putting it into effect. Since the Programme has come into force only last year, and was intended to provide a basis of work during five or six years, it is perhaps premature to attempt a revision of the Programme at this stage. In so far as the United Kingdom has any criticisms of the Agency's activities it would have been prepared to raise them when the Agency's biennial programmes and annual budgets were under consideration. Nevertheless, the Long-Term Programme needs to be revised from time to time and the United Kingdom would be prepared to join in the consideration of any proposals which Member States think it desirable to bring forward.

"In so far as the Board is called on 'to find ways and means to increase its assistance to developing countries' by the General Conference resolution [3], the United Kingdom believe that initially suggestions for modifying the Long-Term Programme in this sense

[21] INFCIRC/50.

[22] By Resolution GC(VII)/RES/151, para. 1.

should come from the developing countries themselves. The possibilities can then be examined in the light of the resources likely to be available."

United States of America

"16 December 1966

"The United States believes that the review called for by the subject resolution [3] should provide the Members of this Organization with a useful opportunity to assess the Agency's programme from the special standpoint of determining whether the Agency is doing all it reasonably can to meet the needs of the developing countries. We plan to follow this matter very closely and will be prepared to offer specific programme suggestions and observations at a later stage. In the meantime, however, we should like to offer these preliminary comments:

"We hope your letter of 20 October 1966 will elicit some useful comments from a number of Member States, most notably from developing countries. We understand that you would propose to present any comments you received to the Board in February. In addition, I am sure that the Board would appreciate receiving the Secretariat's own suggestions and comments as to how adequately the Agency's programme now satisfies the needs of the developing countries and how the programme might be improved from this standpoint.

"It is the view of the United States that many of the programmes of the IAEA already are oriented, in a large part, to the needs of the developing countries. These include not only the Agency's activities in the field of technical assistance (fellowships, equipment, experts and training courses), but many of the activities of the Joint FAO/IAEA Division, the Division of Life Sciences, the Division of Research and Laboratories, and the Department of Technical Operations. We feel these many important current contributions to the needs of the developing countries should be borne in mind in the course of the proposed review. You might wish to summarize the Agency's current contributions to the needs of the developing countries in any presentation you submit to the Board on this subject.

"We also believe it is important to note that several mechanisms now exist for keeping the Agency's programme under essentially continuous review from the standpoint of assuring that the requirements of the developing countries are being adequately met within the limits of the Agency's available resources. These include the periodic meetings of the Board of Governors and its Committees, the meetings of the General Conference, the deliberations of the Scientific Advisory Committee, and the special reviews and assessments that are performed from time to time on selected aspects of the programme. We regard the question of how best to meet the needs of the developing countries to be a perpetual one that the various organs in the Agency should keep before them as they assess specific suggestions and proposals. Moreover, we hope the review will recognize the importance of not disrupting many important activities in other areas and the practical limitations which generally govern the resources available to the Agency for all programmes.

"From a procedural standpoint the United States believes that the proposed review should be designed to afford the developing Member States of the Agency the fullest possible opportunity to express themselves on this matter. We believe the Board of Governors, in February, should address itself primarily to organizing and scheduling the review and we expect to have specific suggestions to make at that time. In the meantime, however, I should like to mention that we believe the review should be undertaken in a systematic fashion, by a Committee of the Board, which would rely heavily on the comments received from the Member States as well as from the Secretariat.

"The United States believes the Agency's activities in the fields of agriculture, medicine, radiobiology, hydrology, nuclear power and desalting should be given special, although not exclusive, emphasis during the review to see whether they deserve additional support. We believe therefore that, in order to assist the assessment, the Board should be informed in an

appropriate fashion of the results of the recent reviews of the agriculture programme and the activities at Seibersdorf. The studies you now have under way on the Trieste Centre and the Monaco Laboratory also will have an obvious bearing on the overall review and the future of the Agency's programme."

Viet-Nam

"No. 1324/NTLC/KTH "10 December 1966

"In carrying out our nuclear programme we have come up against the following difficulties:

- the lack of qualified technical staff capable of taking advantage of the blessings of atomic science in the different fields of national importance;

- inadequate financial means and insufficient equipment; the national budget for atomic research is very restricted and nuclear equipment is in general very expensive.

"These difficulties would seem to be common to all developing countries in their effort to promote the utilization of nuclear energy for peaceful purposes. We would therefore like to suggest that the Agency should take special account of this in working out a rational programme of assistance to technically backward countries. In this sense we wish to submit the following recommendations:

"1. Training of technical staff

1.1 The Agency should attach more importance to the award of fellowships of long duration with a view to training staff to doctorate standard. Such training would seem indispensable both for research and for nuclear training within the country itself.

1.2 It is suggested that in addition to international courses the Agency should organize training courses in nuclear techniques at the regional level. The working documents for such courses would be widely distributed to developing countries to enable them to take full advantage of the instruction given in these courses.

1.3 The absence of lower-grade research staff is a no less important obstacle to the implementation of nuclear programmes, and the Agency is therefore requested to assist in training such staff by means of regional courses or by sending instructors to the requesting countries.

1.4 Since the development of nuclear programmes necessarily means an increasing need for scientific staff, the Agency should consider forthwith the introduction of nuclear instruction at university level in developing countries.

"2. Advanced training

2.1 The frequent organization of advanced courses for specialists in the different practical applications of nuclear energy is much appreciated. However, it would be better if these courses were organized on a regional basis, to reduce travelling expenses and thus increase the number of participants.

2.2 Regional scientific meetings are particularly useful for an exchange of views between the scientists within the region and for making the personal contacts necessary for establishing an effective programme of regional co-operation. It is suggested that these meetings be organized in all the developing countries of a particular region in turn.

"3. Research

3.1 In the case of research of common interest to an entire region it is better for the developing countries in that region to concentrate their efforts in a programme of regional co-operation supported by the Agency itself or by one or more advanced countries. This co-operation could take the form of the establishment of regional research centres: for Asia and South-East Asia one regional centre could be established for research in tropical medicine and another for agricultural research.

3.2 As far as research projects of local interest are concerned, it is desirable that the Agency should help to get them under way by the offer of technical assistance under its Regular Fund, or by putting the centre concerned in touch with one in an advanced country.

"It should be mentioned that in the present circumstances Viet-Nam is not in a position to derive full benefit from the recommendations presented above. As we explained at the tenth regular session of the Agency's General Conference in Vienna last September, there are great difficulties in sending our young scientists abroad. For this reason, the only form of assistance which could for the moment be fully utilized would be the sending of Agency experts to Viet-Nam to help us carry out our research projects on the practical applications of atomic science [23]."

Yugoslavia

"02-20 2804/1: 9 XII 66 "7 December 1966

"... the Yugoslav Nuclear Energy Commission proposes that for the promotion of the peaceful uses of nuclear energy under long-term assistance to developing countries the Agency continues with its usual activities paying particular attention to the following:

"(1) The establishment on every continent of two or at least one permanent school for elementary or advanced courses in the use of radioisotopes and sources of ionizing radiations in industry, agriculture, medicine, veterinary sciences, hydrology, geology, etc. These schools would be designed to train experts of various professions for work with radioisotopes and sources of ionizing radiation, and for the application of protective measures during such work. Training would have to include also experimental work in laboratories and installations.

"(2) The study and identification of research problems in areas of interest in a wider economic context, the solution of which may be of great importance for the economic, medical, and cultural development of that area. Such problems may be encountered in agriculture (eradication of insect pests, plant selection, improved soil fertilization, study of soil humidity), in hydrology (assessment of water balance in some areas, supply of water, etc.), in veterinary medicine (diagnostics and therapy of farm animals, combating epidemics in animals, selection of suitable breeds, etc.), in medicine (assistance to countries in the utilization of methods for the diagnosis and therapy of various diseases by means of ionizing radiation, and the use of labelled compounds for the same purposes).

"(3) Assistance to continents in the organization of the production and distribution of the most frequently used radioisotopes and labelled compounds in industry, agriculture, human and veterinary medicine, hydrology, etc.; assistance in the exchange of radioisotopes among consuming Member States.

"(4) Assistance to continents in organizing centres, for protection against ionizing radiation in case of larger accidents, in concordance with the countries concerned.

---

[23] A list of these projects was annexed to the communication.

"(5) Assistance to individual countries in the assessment of their power situation and prospects, with regard to conventional and nuclear fuel alike.

"(6) Increased dispatch of junior scientists from developing countries into research centres in developed countries by requesting the latter to increase the number of their fellowships offered to the Agency.

"(7) Increased dispatch of experts from developed into developing countries for the solution of concrete problems in the peaceful uses of nuclear energy.

"(8) Assistance to developing countries in the preparation of research programmes in the peaceful uses of nuclear energy and in the drafting of regulations governing the use of nuclear energy for peaceful purposes, the transport of nuclear fuel and sources of ionizing radiations, etc."

ANNEX B

A PRELIMINARY ANALYSIS OF THE EXTENT TO WHICH THE AGENCY'S ACTIVITIES BENEFIT DEVELOPING COUNTRIES

PART I

GENERAL

A. INTRODUCTION

1. The Agency's Long-Term Programme [1], approved by the General Conference on 1 October 1963, is at present serving as a guide in planning and executing the Agency's work. It envisages that the Agency's roles and principal tasks during the period 1965-70 will be:

(a) To strive by international action .... to assist in preparing Member States for the introduction of atomic energy in its manifold peaceful uses ....; and

(b) To stimulate and co-ordinate work on the development of science and technology with a view to making the advantages of the peaceful uses of atomic energy available to the maximum number of countries in the shortest possible time. [2]

2. Thus, the programme distinguishes between work oriented to meet the needs of the developing countries as a group or as individuals, and work of a somewhat different character oriented towards fostering nuclear technology for the benefit of the membership as a whole. It sees the need for both types of work and regards them as interdependent.

3. In accordance with this distinction, this analysis will divide the Agency's work as follows:

(a) "Developing country oriented"

(i) Assistance given direct to individual developing countries or developing regions;

(ii) Activities carried out in developing countries (on the assumption that the subject of such activities will always be of interest to developing countries); and

(iii) Activities carried out in technically advanced countries whose subject is of special interest to the developing countries.

Of the resources amounting to approximately $86 million put at the Agency's disposal from 1958 through 1966, approximately $29.6 million has been made available for direct aid to individual developing countries. A substantial proportion of the remaining $56.4 million has been spent on activities in developing countries or on activities of special interest to them. This matter is examined in greater detail in the financial analysis below.

(b) "Universally oriented"

This covers the remaining scientific and technical activities of the Agency. At present many of these are chiefly of interest to technically advanced countries but will be of medium- or long-term interest to the developing countries.

---

[1] INFCIRC/50.

[2] Ibid., para. 7.

Definition of developing countries

4. All countries for which a programme under the UNDP/TA component has been approved by the UNDP Governing Council for the period 1967-68 will be considered as "developing countries" and whenever referred to by name will be marked by an asterisk. This is the classification used with regard to the award of fellowships to developing countries under the Agency's regular technical assistance programme. The list which is appended to this Annex covers 69 Member States of the Agency.

5. The level of economic development of the 69 developing Member States listed varies widely: some have hardly reached the threshold of modern science and technology; others are relatively highly industrialized.

Period covered by the analysis

6. In most cases it will be found convenient to analyse each category of activity from 1958 through 1966 so as to bring out significant trends. In other cases, the conditions governing the activity have changed so much as to diminish the utility of an analysis from the start.

B. THE AGENCY'S POLICIES AND PRACTICES GOVERNING ASSISTANCE TO THE DEVELOPING COUNTRIES

7. It is appropriate to recall certain fundamental guides to and limitations upon the Agency's activities, viz:

(a) The Statute. The Statute enjoins the Agency "to bear in mind the special needs of the underdeveloped areas of the world". [3] At the same time it requires the cost of all materials, services, equipment and facilities provided by the Agency to individual Member States to be paid for out of voluntary contributions. [4] In practice, this means that all technical assistance the Agency gives depends entirely upon voluntary contributions or upon sources of finance outside the Agency's budget. The total amount of such assistance cannot therefore be directly increased or decreased by decision of the Agency in the same way that it can vary the amount of its other activities financed from assessed contributions to the Regular Budget. The Statute also prescribes [5] that the Agency shall not be a financing institution, although it may help Member States to secure financing from outside sources;

(b) The functions of other United Nations organizations. The network of formal relationship agreements the Agency has with the United Nations and other members of the United Nations family of organizations is designed to ensure the Agency's primacy in the peaceful uses of atomic energy. They also confine its activities to this particular field;

(c) The policies and practices of multilateral programmes. By participating in programmes such as UNDP, the Agency has engaged itself to observe their policies and practices. Thus, the General Conference has laid down that the Agency shall apply to its own technical assistance activities the guiding principles and criteria that govern such multilateral programmes, recognizing, however, the need for a certain degree of flexibility in view of the special character of the Agency's operations. [6] These principles apply to all aid in the form of experts, fellowships and other training activities and equipment. One principle of fundamental importance is that assistance is given only at the request of a State and that the form of assistance given shall be in accordance with that State's wishes;

---

[3] Article III.B.3.

[4] Article XIV.B.2, E and F.

[5] Article XI.B.

[6] GC(IV)/113, Annex, para. 1.A.E.

(d) Other functions of the Agency. The Statute requires the Agency to carry out certain functions that do not constitute assistance in the usual sense of the word and that lie outside the scope of this paper. Of these the chief one is the application of safeguards.

C. ANALYSIS OF HELP GIVEN, BY OBJECTS OF ASSISTANCE

8. The Long Term Programme foresees that assistance may be designed: [7]

(a) To raise the general scientific capability of a country and prepare it for the introduction of nuclear science and technology. About one fifth of the Agency's 67 developing Member States fall into the category of countries which will need more help in basic science education before they can begin to train their personnel in the simpler nuclear science techniques. This kind of help has been regarded as lying within the competence of organizations such as UNESCO. In certain cases, however, it has been possible to give aid in the framework of a larger agricultural development project.

(b) To introduce the first practical contribution of nuclear science to the national welfare or economy of a country. This objective overlaps with the previous one. There are at present 49 Member States that have not yet constructed or are not yet constructing a research reactor in this and the previous category. Approximately 25% of all technical assistance funds [8] given by the Agency from 1958-1965 went to countries in these two categories.

(c) To give help to research programmes or to practical applications already established in a country. For practical purposes developing Member States that have or are building a research reactor are classified in this group. The 24 Member States concerned received nearly 75% of all technical assistance funds [8] given under the Agency's auspices from 1958 to 1965. In 1965 itself these Member States accounted for 73% of the funds.

(d) To give help in connection with nuclear projects of major potential economic benefit (chiefly UNDP/SF type projects). Three of the Agency Special Fund type projects are or were in countries having research reactor facilities; the fourth embraces a group of countries not having such facilities. Of the total of approximately $29.6 million referred to in paragraph 3(a) above ("direct aid" to developing countries), Special Fund type projects have accounted for approximately $1.2 million or 4%. In 1965 they accounted for approximately 15% of direct aid.

9. As a pre-condition of Agency aid, many countries need help in planning their programmes and setting their own priorities. A total of nine missions has been sent out since 1958 to help 45 developing Member States to do this. This type of help is increasingly given through assignment of a long-term expert to the requesting country.

D. TYPES AND SOURCES OF ASSISTANCE

10. Typical assistance given by United Nations organizations such as the Agency comprises the types described below.

(a) Individual or group projects

(i) Training (fellowships, training courses, study tours, scientific visits etc.)

(ii) Services of experts

(iii) Demonstration equipment

---

[7] INFCIRC/50, paras. 143 to 151.

[8] That is, technical assistance, in cash and in kind, devoted to country projects but excluding technical assistance given in the framework of Special Fund type projects.

11. These three types of assistance, classically described as "technical assistance", are now given almost exclusively to developing countries. Despite the fact that this assistance depends entirely on voluntary contributions or outside sources of finance, the Agency has awarded, during 1958-1966, a total of 2521 fellowships, has held 62 training courses attended by 974 participants, has provided the services of 806 experts for 3462 man-months and has channelled equipment to the value of $2 784 900 in connection with technical assistance projects.

12. The steadily widening range of atomic energy applications has, however, been coupled in the case of the Agency's own regular programme with a levelling off of the total amount of voluntary contributions and a contraction of the amount of services and equipment these contributions can buy. The following table shows the steady decline in the percentage of requests that could be met over the years 1959-1966.

TABLE 1

The Agency's regular technical assistance programme

Assistance in the form of experts and equipment
(in thousands of dollars)

Year	Value of requests received	Value of assistance approved	Percentage of requests met
1959	690.0	619.4	89.6
1960	1 150.0	599.2	52.1
1961	1 277.6	513.1	40.4
1962	1 530.0	757.6	49.5
1963	1 750.0	856.7	48.9
1964	2 400.0	804.6	33.3
1965	2 500.0	874.0	35.0
1966	3 000.0	902.0	30.0

(iv) Information, i.e. access to recorded information; and direct exchange through scientific meetings

13. This assistance is given to all Member States. The use made of it is likely to bear some proportion to the nuclear programme of the State concerned. From 1958 through 1966, the Agency held 86 scientific conferences, symposia and seminars in which, out of a total of 12 457 participants, 1884 were scientists from developing countries. The average developing country participation was thus just over 15%.

14. From the analysis given in Part II below, it appears that the main impediments to participation are, for many developing countries, the general shortage of nuclear scientists and, for others, the costs of any travel abroad rather than the advanced character of the topic or the location of the meeting in an "advanced" instead of in a developing country. The financial problem has been met to some extent since 1962 by holding regional study group meetings with some subsidized participation by scientists from developing countries.

15. The chief source of funds for information activities is the Regular Budget of the Agency.

(b) Research support

16. In the past the programme has been directed towards three general objectives, which are not of course mutually exclusive:

(i) Research in support of statutory activities;

(ii) Research on problems of interest to the membership as a whole; and

(iii) Research oriented towards specific problems of developing countries.

The trend has been to concentrate increasingly on objectives (i) and (iii).

17. The principal aim of a research contract is to obtain scientific results in the most effective manner; any assistance benefits are incidental. The award of a research contract to a qualified and competent laboratory in a developing country can, however, stimulate and guide local research and may in this sense constitute the next stage beyond technical assistance. The Board has therefore generally agreed that preference should be given to laboratories in developing countries if they can provide the high standard of services required.

18. The subject largely determines where the contract will be placed. For example, research in high-level waste management techniques must usually be undertaken in amply equipped advanced laboratories, whereas a co-ordinated research programme on rice production would inevitably involve laboratories in several developing countries.

19. The proportion of research contract funds awarded to institutes in developing countries grew from 23% in 1958-59 to 65% in 1963, and has remained at about this level since then. Several contracts of direct relevance to developing countries are also placed each year at institutes in technically advanced countries; in 1966 these represented an additional 12% of research contract funds. In other words in 1966, about three quarters of all research contract funds were awarded for research of benefit to developing countries. In financial terms, more than $3 400 000 of the $5 540 000 spent on research contracts from 1958-66 were awarded to institutes in developing countries.

(c) Miscellaneous scientific services (standardization, analysis of samples etc.)

20. These services, most of which are provided by the Agency's laboratories, are equally available to all Member States. The number of samples distributed increased from 1120 in 1963 to 1851 in 1966. The scope of these activities is entirely dependent on demand from Member States and to a large extent they are financed out of charges made. Revenue from such charges in 1966 amounted to about $45 000.

(d) Major aid

21. The smaller individual and group projects constituted the bulk of the Agency's assistance in the early years and still account for 85% of the resources available for direct aid in 1965. The establishment of the Special Fund in 1959 has made it possible for the Agency to execute projects of far greater potential. They include permanent training and applied research centres; pre-investment projects like pilot plants for food irradiation; large field experiments and comprehensive pre-investment studies. Outside the Special Fund, the Agency is also taking part with two Member States in a feasibility study of what is potentially a major desalting and power project.

22. The smaller items of aid have been and will continue to be a valuable adjunct to the research and isotope application programmes of developing countries. Their value has increased by the introduction of integrated programming of technical assistance. It is, however, by major projects of the Special Fund and feasibility study type that atomic energy can begin to have a large and visible impact on the fundamental problems of development.

23. It must be remembered, however, that in relation to the Special Fund the Agency's role is solely that of an executing body, selected by another organization, to carry out a project that a developing country has decided to give priority to. In making this priority decision, the Government concerned will have had to consider the full and vast range of its developmental needs and the scarce international resources available for meeting them. In other words, nuclear techniques must compete, in this regard, with a wide range of possible activities, many of which may appear to be more closely related to the fundamental problems of development.

24. Thus, of a total of 657 Special Fund type projects approved by the Governing Council of UNDP by the end of 1966, four were concerned with atomic energy and assigned to the Agency for execution. In financial terms, the Agency's share has been $\$2\frac{1}{2}$ million out of $644 million approved - i.e. earmarked by the end of 1966. Three of the four projects related to the agricultural applications of nuclear science.

25. As nuclear techniques pass from the stage of the laboratory or field experiment to that of industrial or field application the direct contribution they can make to economic development will be increasingly clear to Governments. This applies particularly to various promising lines of agricultural applications as well as to power and desalting. Many, if not all, of these will probably require close collaboration with other agencies of the United Nations family of organizations, primarily FAO, but perhaps also WHO and the United Nations itself.

(e) Sub-contractual arrangements

26. Nuclear techniques may also play a subsidiary role in major projects of other organizations (and thus not be immediately perceptible as Agency assistance to developing countries). The Agency has a standing arrangement with FAO whereby the latter sub-contracts to the Agency the work of carrying out hydrological/isotope investigations wherever they can be useful in Special Fund type water resources development projects; six such arrangements have been made in large-scale mineral surveys.

(f) Financial aid

27. The funds allotted to pre-investment studies have been described as "seed money". They will obviously only have a direct impact on economic development if they are followed by a far larger capital investment. Since the Agency is not a financing institution, its effectiveness in this regard will depend on the extent to which it can pave the way for action by international financing institutions.

(g) Regional centres

28. The first mission sent out by the Agency (in 1958) was intended to prepare the way for a regional training and applied research centre. The Board has received proposals over the years for some six projects of this kind, as well as for a number of international centres. Several additional regional centre projects have been discussed informally with the Secretariat from time to time. To date, one regional and one international centre have been established under the Agency's auspices.

29. The innate attractiveness of the concept of a regional pooling of scarce resources is obvious. It has, however, proved very difficult in practice to obtain the firm commitment of continued support from a substantial group of countries within the region that is essential if a regional project is to be viable and eventually self-supporting.

(h) Other types of aid

30. The Agency will probably continue to act as a channel for certain special gifts in kind, such as the six radiotherapy centres and the liquid nitrogen loop that have been provided or offered to developing countries under its auspices, as well as for the equipment that has

been donated by Member States for integration into approved technical assistance projects. This type of help, while of much value to the recipient countries, is dependent upon the generosity of the donor and the Agency can do little to affect the amount that is given or to plan ahead for such aid.

31. Certain organizations have also launched special campaigns such as the "Freedom from Hunger" campaign of FAO and the malaria eradication campaign of WHO. These activities are usually financed, at least at the beginning, by voluntary contributions to a special account. In relation to many of these, nuclear techniques will probably grow in importance, e.g. by increasing man's food supply through the use of irradiation to preserve food, to eliminate pests, to produce improved strains of crop plants and to combat animal disease. Widespread application of these techniques will mainly require close collaboration with those organizations directly concerned with agriculture and health.

E. FIELDS OF ASSISTANCE

32. The Long-Term Programme contemplates that the Agency will work in fields vital to the long- or medium-term future of atomic energy (e.g. plasma physics, thermonuclear fusion, and breeder reactor technology) as well as in fields that lend themselves more easily at present to being the subject of assistance to developing countries (e.g. nuclear medicine, and isotope applications in hydrology and agriculture). [9]

33. Nuclear desalting is an example of a subject which is of particular potential value to developing countries in the long or medium term provided that the technology is fostered effectively by the advanced countries.

34. The Agency does not carry out or financially support research in the "advanced" fields. Its work in this area consists chiefly of scientific meetings and other forms of information exchange designed:

(a) To stimulate progress and co-ordination of research in advanced centres;

(b) To help develop technologies, eventually of use to developing and advanced countries alike; and

(c) To provide a bridge between scientists in developing and advanced countries.

F. FINANCIAL ANALYSIS

35. The following analysis attempts to give a very general idea, in financial terms, of the objects to which Agency resources have been channelled in the past eight years, and a more detailed financial picture of the orientation of resources in 1966.

36. The following tables show:

(a) The total amount of resources available to the Agency for direct aid to individual developing countries during the period 1958-65. By direct aid is meant aid in the form of experts, fellowships and other training facilities, equipment and supplies, including resources made available in cash and in kind by Member States, UNDP/TA and UNDP/SF; and

(b) The total appropriations for each of those years for all other programmes and activities of the Agency, including "developing country oriented" and "universally oriented" programmes.

---

[9] INFCIRC/50, paras. 72 and 76.

TABLE 2

Total amount of resources available to the Agency for direct aid to individual developing countries

	1958	1959	1960	1961	1962	1963	1964	1965	1966[a]	TOTAL
Allocations to regular technical assistance programme under Operating Fund II (including miscellaneous income)	124 612	892 933	1 075 026	1 038 226	1 259 378	1 351 226	1 186 021	1 296 957	1 386 413	
UNDP/TA projects		278 401	592 372	450 190	1 146 166	666 874	1 207 560	547 616	1 023 439	
UNDP/SF projects					293	202 462	427 901	496 304	91 000	
Technical assistance and training (Administrative Budget)[c]		1 475 000	1 341 000	1 148 000	549 420	663 490	627 440	520 380	581 320	
Type II fellowships		561 500	807 000	748 771	480 550	521 000	621 050	530 400	531 000	
Technical assistance equipment and supplies			192 000	105 000	167 500	1 220	89 500	77 700	77 500	
Special nuclear materials		107 991	40 550	33 170	50 000	49 200	50 000	50 000	49 639	
	124 612	3 315 825	4 047 948	3 523 357	3 653 307	3 455 472	4 209 472	3 519 357	3 740 311	29 589 661[b]

TABLE 3

Total appropriations for all other programmes and activities of the Agency

	1958	1959	1960	1961	1962	1963	1964	1965	1966	TOTAL
Administrative Budget										
General Conference and Board of Governors		750 000	851 000	824 000	643 000	670 000	626 000	588 500	585 000	
General direction and administrative services		1 400 000	1 480 000	1 119 000	1 572 020	1 671 940	1 761 470	1 937 470	2 212 750	
Nuclear power and reactors					459 840	555 590	582 300	606 100	627 940	
Radioisotopes					472 230	603 430	663 220	797 890	959 620	
Health, safety and waste management					1 047 840	1 117 390	1 043 710	925 600	891 160	
Research and services in physical sciences					529 920	774 490	804 680	1 105 750	1 205 250	
Safeguards					252 720	385 210	334 070	353 860	417 130	
Information and technical services					734 010	895 960	1 001 610	1 102 450	1 263 830	
Preparation and distribution of scientific information		550 000	1 103 000	1 520 000						
Regulatory activities		1 050 000	1 068 000	1 557 000						
Supporting laboratory activities										
Total for Administrative Budget	4 089 000	3 750 000	4 502 000	5 020 000	5 711 580	6 674 010	6 817 060	7 417 620	8 162 680	
General Fund	129 142	1 918 540	1 071 049	1 327 268	1 424 137	1 480 759	1 358 960	1 376 476	1 406 000	
Deduct allocations to Operating Fund II (for technical assistance)	124 612	892 933	1 075 011	1 037 930	1 247 659	1 330 223	1 134 534	1 242 040	1 351 586	
Total for Operating Fund	4 530	1 025 607	(3 962)	289 338	176 478	150 536	224 426	134 436	54 414	
International Centre for Theoretical Physics, Trieste							286 435	278 000	278 000	
Research contracts (funds from the United States Atomic Energy Commission)			132 354	177 280	169 251	105 977	204 189	101 506	83 219	
Laboratory and laboratory equipment (donations)	45 000	47 200	34 172	5 000	26 530	5 350	108 982	30 050	114 950	
	4 138 530	4 822 807	4 664 564	5 491 618	6 083 839	6 935 873	7 641 092	7 961 612	8 693 263	56 433 198
						GRAND TOTAL				86 022 859

a/ The figures for 1966 are subject to minor corrections.

b/ In addition, special items of equipment (such as medical centres) to the value of approximately $300 000 have been provided or offered to developing countries under the auspices of the Agency.

c/ The apparent decline in the amounts shown under this item each year between 1959 and 1962 was due almost entirely to a change in the method of allocating estimated expenditures for the budget year, and not to any real diminution in the funds available.

37. It will be seen that the average yearly amount of resources available for direct aid during the two-year period 1963-64 was $3 800 000. The average yearly amount available for all other programmes and activities during those two years was $7 300 000. The two-year period is chosen because drawings on UNDP/TA tend to be lower in the first than in the second year.

38. The corresponding averages for the two-year period 1965-66 were $3 600 000 for resources available for direct aid and $8 300 000 for other programmes and activities.

39. It will be seen that the resources available for direct assistance to individual countries over each of the two-year periods were equal to nearly half the resources available for all other programmes and activities of the Agency.

40. The next logical step in the analysis would be to see how far these other programmes and activities were "developing country oriented" and how far they were "universally oriented". Such an analysis is made in statistical and qualitative terms in Part II; it is not yet possible to make it in financial terms. Nevertheless, the following table, which summarizes the situation in 1966, gives some guidance when it is read together with the analysis in Part II.

TABLE 4

Analysis of resources available in 1966

	$	$
Total of all resources available for direct aid[a/]		3 740 311
Amount appropriated for:		
Nuclear power and reactors	627 940	
Radioisotopes	959 620	
Health, safety and waste management	891 160	
Research and services in physical sciences	1 205 250	
Safeguards	417 130	
Information and technical services	1 263 830	5 364 930
Governing bodies and general administration		2 797 750
GRAND TOTAL		11 902 991

a/ Including Agency regular technical assistance; UNDP/TA; UNDP/SF; Type II fellowships; technical assistance; equipment and supplies; special nuclear materials and medical centres.

41. The table shows that of a grand total of $11 902 991 of resources available to the Agency in 1966, $3 740 311 were available for direct aid to developing countries. [10] A further $5 364 930 were appropriated for "mixed" scientific and technical programmes, in each of which a balance was struck between "developing country oriented" activities and "universally oriented". A further $2 797 750 were appropriated for the cost of the Governing Bodies of the Agency, general direction and administrative services.

[10] The amount available for direct aid in 1966 was somewhat reduced as a result of the unusually small Special Fund allocation in that year, viz: $91 000 in place of $496 304 in 1965 and a comparable figure in 1964.

42. The very general impression which emerges from Part II of this analysis, with regard to the various "mixed" scientific and technical programmes, could be summed up as follows:

(a) The programmes on nuclear power and reactors and on radioisotopes are mainly "developing country oriented". Within the radioisotopes programme the developing country orientation is strongest in the field of atomic energy in agriculture;

(b) The orientations of the programmes on research and services in the physical sciences and information and technical services are mixed and it is difficult to draw any conclusion as to the predominant emphasis; and

(c) Regulatory work, that is to say, work on health, safety and waste management is by its nature predominantly oriented to be of universal utility, although an increasing proportion of the work consists of providing services to developing countries, now that the main "legislation" in this field has been completed.

PART II

ANALYSIS OF SPECIFIC TECHNICAL PROGRAMMES

43. Much of the work done by those divisions of the Secretariat whose activities relate to a specific discipline provides the scientific/technical content of other programmes and is analysed under the sections dealing with those programmes. Thus, for instance, symposia on nuclear power are, together with all other symposia, analysed under Information and technical services and not under Nuclear power and reactors.

44. Each scientific or technical division also takes part in the task of providing help direct to individual developing countries in programmes such as that on technical assistance. Thus for example, the medical section of the Division of Life Sciences will play a big part in evaluating the scientific aspects of a request for a medical isotope specialist and in selecting a specialist if the request is approved. While this thread runs through almost all the Agency's activities, it is difficult to state in quantitative terms the amount of work done in each technical programme in support of "direct aid" activities. All technical assistance and related activities are analysed under section A below.

45. Part II of this paper uses, as far as possible, the same sub-heading and follows the same order as the Agency's Programmes for 1965-66 and 1967-68. [11]

A. TECHNICAL ASSISTANCE [12]

46. The technical assistance programme is exhaustively analysed each year in the special report to the Board: the present analysis will be confined to overall trends from 1958-66.

Planning of technical assistance programmes

47. Technical assistance given by the Agency is carried out in accordance with the Guiding Principles and General Operating Rules approved by the General Conference in 1960. [13] Thus, all assistance granted by the Agency since 1958 has resulted, in accordance with these Principles and Rules, from the requests of Governments. The form and magnitude of each request which is approved are the result of close scrutiny by the Secretariat of the initial requests submitted by a Government and of subsequent consultations, in almost every case, with the Government concerned.

48. From 1959 to 1962, the Agency sent Preliminary Assistance Missions, covering a large number of disciplines, to advise Member States on the planning of their atomic energy programmes and on the help they could obtain from the Agency. The missions laid the foundation for subsequent technical assistance contacts and for the drawing up of specific technical assistance requests. By the end of 1962, nine missions had visited 45 countries in the developing areas. They had made 107 recommendations for specific technical assistance projects, of which 87 were subsequently submitted as requests by the State concerned.

49. The valuable pioneering work of these missions led several Member States to recommend that smaller follow-up missions should maintain contact with national programmes. Since 1961 ten such missions have visited 45 countries. These missions have helped to introduce integrated technical assistance planning in the countries concerned.

---

[11] Documents GC(VIII)/275 and GC(X)/332 respectively.

[12] Used in the sense described in para. 11.

[13] GC(IV)/RES/65, Annex.

50. As national programmes have gained strength and become better defined over the years, the type of advice needed from the Agency has become more specific and sometimes specialized. Nevertheless, requests for help in overall and general planning still continue to be received.

Distribution of technical assistance by field of activity 1958-66 (country assistance only)

51. Table 5 [14] shows how the programme has been distributed between ten different subjects (ranging from General atomic energy development to Safety in nuclear energy). The table shows the number of experts and fellows, and in the case of equipment the value in thousands of dollars, under each of the ten headings. It also gives these data, under each heading, as a percentage over the nine-year period in question.

52. It will be seen that the largest programme has been in the application of isotopes and radiation in agriculture, followed by nuclear engineering and technology and nuclear physics. Application of isotopes and radiation in medicine comes fourth.

53. During the first two years the programmes were very small and consisted almost entirely of fellowships. Since 1960, the trends show increasing emphasis on the two leading topics, agriculture and nuclear engineering. These trends are even more clearly brought out in the ten charts (5.A-5.J) [14] which show the number of experts in each field of activity (including experts provided in the framework of Special Fund projects). Caution should, nevertheless, be observed in discerning trends since the absolute numbers of experts and fellows involved in each programme are rather small. Equipment, in particular, is likely to vary very much from year to year in any given programme.

Regional activities

54. Table 6 [14] shows the distribution of regional training courses over the same ten fields of activity. It will be seen that 62 courses attended by 974 participants were held. Three regional advisers on medical and agricultural applications have been appointed. One regional isotope training centre (The Middle Eastern Regional Radioisotope Centre for the Arab Countries) has been established, and 78 scientists from the region have been trained there; the Centre has also undertaken regional research experiments.

55. It is even more difficult to discern trends in the case of regional activities. The table shows, however, the importance once again of activities in agriculture, courses in this subject having accounted for 299 of the total 974 participants over the eight years.

Distribution of assistance by component elements (experts, fellowships and equipment)

56. Table 7 [14] and charts 7.A and 7.B [14] provide an analysis of the way in which the programme has been distributed between experts, fellowships and equipment.

57. In accordance with the Guiding Principles and with UNDP practice under the basic resolution of ECOSOC, relating to technical assistance [15], equipment and supplies may be provided in so far as they form an integral part of a project of technical assistance. This reflects the concept that international technical assistance is a means of transferring skills and not a means of channelling "grant aid". Technical assistance, in other words, provides the element of "know-how" that is not available locally, and in the process of imparting this "know-how" certain demonstration equipment and supplies may be needed by the expert (or conceivably by the returning fellow).

58. However, it has been recognized that nuclear techniques involve a larger equipment component than the techniques that are normally the concern of United Nations organizations. Accordingly, the General Conference has noted the special character of the Agency's

[14] Reproduced at the end of section A.

[15] ECOSOC Resolution 222a(IX) of 15 August 1949.

operations, the need for a corresponding degree of flexibility and the increasing need and demand for equipment from developing countries. [16] Accordingly also the Board has, on occasion, approved the grant of equipment under the Regular Programme, not in conjunction with an internationally recruited expert.

59. Equipment has accounted for almost 20% of all technical assistance given under the Agency's Regular Programme. This is considerably higher than the proportion of equipment provided under UNDP.

60. The overall breakdown for all technical assistance (including technical assistance given in the framework of Special Fund projects) for the period 1958-66 was as follows:

Fellowships	50%
Experts	31%
Equipment	19%

61. Chart 7.A [14] shows that the equipment component rose from approximately 16% in 1960 to 24% in 1966. The rise in the experts component has been even more marked: from 20% in 1960 to 38% in 1966. The declining proportion of fellowships is partly accounted for by the fact that the first Agency programme was entirely confined to this type of assistance. Other reasons are that demand decreased after the large initial need for trained personnel had been satisfied; that better facilities are now available at home; and that in-service training of the "counterpart" to an international expert meets part of the need.

62. It should be recalled again that the proportion between these three components of technical assistance reflects the desires and the requests of Governments and not the decisions of the Agency.

Special Fund

63. The Agency has been the executing agency for four Special Fund projects, viz:

(a) A pre-investment study on power, including nuclear power (Philippines*);

(b) A project for the extension of research and training facilities at an institute for the application of nuclear energy in agriculture, veterinary medicine and forestry (Yugoslavia*);

(c) A project to demonstrate the technical feasibility of eradicating the Mediterranean Fruit Fly by the sterile male technique (six Latin American countries*); and

(d) A pilot project for irradiation and disinfestation of stored grain (Turkey*).

64. The first two projects have been completed and the other two are in progress.

65. The Agency has also acted as sub-contractor to another executing agency of Special Fund projects - FAO - in six water resources projects that have involved the application of radioisotopes in hydrological studies. The use of the Agency's services is being considered by other specialized agencies that execute projects involving these techniques.

66. Requests for Special Fund projects are submitted direct by Governments to the Special Fund. The Special Fund decides (sometimes in the light of comments given by participating organizations and consultants) whether the project is sound and can be financed within the resources available to that Fund; it also selects the executing agency.

67. In conclusion, it should be noted that many of the development projects executed by other organizations are in traditional and well-established fields of activity and consist often of replicas of projects already carried out elsewhere in the developing countries. Each of the four Special Fund projects so far assigned to the Agency has, on the other hand, been a pioneering venture - in a field new to the United Nations family and to economic development.

---

[16] General Conference Resolution GC(IV)/RES/64.

TABLE 5

Distribution of Technical Assistance by FIELD OF ACTIVITY: 1958-1966

Field of activity		1958			1959			1960			1961			1962			1963			1964			1965			1966			1958-1966		
		(1)	(2)	(3)a/	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
General atomic energy development	Experts	-		-	1		5	2		3	4		4	1		1	-		-	2		1	5		3	3		2	18		2
	Equipment		-			-			-			-			-			17.7	5		27.6	3		46.1	8		11.3	1		102.7	3
	Fellows	-		-	-		-	2		1	-		-	3		1	3		1	9		3	2		1	1		1	20		1
Nuclear physics	Experts	-		-	6		27	15		25	18		20	19		15	21		17	19		12	25		16	24		17	147		17
	Equipment		-			-			52.0	19		6.6	3		72.3	17		109.5	28		171.0	22		78.4	13		37.2	4		527.0	15
	Fellows	24		15	52		18	56		15	42		16	82		23	55		23	81		28	86		32	85		27	563		22
Nuclear chemistry	Experts	-		-	2		9	7		12	5		5	14		11	16		13	19		12	6		4	10		7	79		9
	Equipment		-			-			21.7	8		35.4	15		27.2	7		27.4	7		60.1	8		21.0	4		41.7	5		234.5	7
	Fellows	18		11	43		15	49		13	35		13	34		9	26		11	21		7	23		8	20		6	269		10
Prospecting, mining and processing of nuclear materials	Experts	-		-	1		5	11		18	16		17	12		10	8		7	8		5	10		7	6		4	72		8
	Equipment		-			-			15.7	6		7.8	3		37.0	9		38.2	10		27.1	3		22.6	4		36.7	4		185.1	5
	Fellows	8		5	15		5	29		7	20		8	10		3	10		4	8		3	10		4	7		2	117		4
Nuclear engineering and technology	Experts	-		-	1		5	3		5	11		12	17		14	18		15	29		19	42		27	28		20	149		17
	Equipment		-			-			40.5	15		47.6	20		104.0	25		40.4	10		79.2	10		77.4	14		128.5	15		517.6	15
	Fellows	53		33	72		24	84		22	51		19	75		21	53		22	58		20	53		20	80		25	579		22
Application of isotopes and radiation in agriculture	Experts	-		-	2		9	6		10	8		9	14		11	25		20	35		23	33		21	34		24	157		18
	Equipment		-			-			23.5	9		50.8	22		55.7	13		61.3	16		259.8	33		218.5	39		470.2	53		1139.8	32
	Fellows	11		7	20		7	35		9	21		8	31		9	21		9	31		11	33		12	48		15	251		10
Application of isotopes and radiation in medicine	Experts	-		-	4		18	7		12	15		16	12		10	9		7	12		8	11		7	18		13	88		10
	Equipment		-			-			10.5	4		15.4	6		86.1	21		41.8	11		51.9	7		34.9	6		84.2	9		324.8	9
	Fellows	15		9	34		11	39		10	33		12	49		13	18		7	30		11	25		9	28		9	271		11
Application of isotopes and radiation in biology	Experts	-		-	-		-	2		3	4		4	5		4	6		5	5		3	6		4	5		4	33		4
	Equipment		-			-			47.0	17		4.4	2		-	-		3.8	1		12.5	2		16.4	3		29.0	3		113.1	3
	Fellows	13		8	18		6	35		9	26		10	38		10	25		10	24		8	16		6	16		5	211		8
Other fields of application of isotopes and radiation	Experts	-		-	2		9	-		-	3		3	5		4	11		9	11		8	5		3	5		4	42		5
	Equipment		-			-			32.1	12		-	-		18.6	4		21.3	6		82.7	10		16.3	3		31.9	4		202.9	6
	Fellows	8		5	8		3	11		3	9		3	19		5	9		4	10		4	7		3	11		4	92		4
Safety in nuclear energy	Experts	-		-	3		13	7		12	9		10	25		20	9		7	14		9	12		8	8		5	87		10
	Equipment		-			-			27.6	10		67.7	29		17.4	4		23.6	6		13.5	2		31.2	6		15.8	2		196.8	5
	Fellows	11		7	33		11	42		11	30		11	23		6	21		9	14		5	13		5	18		6	205		8
TOTAL	Experts	-		-	22		100	60		100	93		100	124		100	123		100	154		100	155		100	141		100	872		100
	Equipment		-			-			270.6	100		235.7	100		418.3	100		385.0	100		785.4	100		562.8	100		886.5	100		3544.3	100
	Fellows	161		100	295		100	382		100	267		100	364		100	241		100	286		100	268		100	314		100	2578		100

a/ (1) Number of experts or fellows respectively.
(2) Value in thousands of dollars.
(3) Percentage of the number of experts and fellows or of the value in thousands of dollars of equipment respectively.

CHARTS 5.A-5.J

Trends in the technical assistance activities of the Agency

(Number of experts in the field including Special Fund)

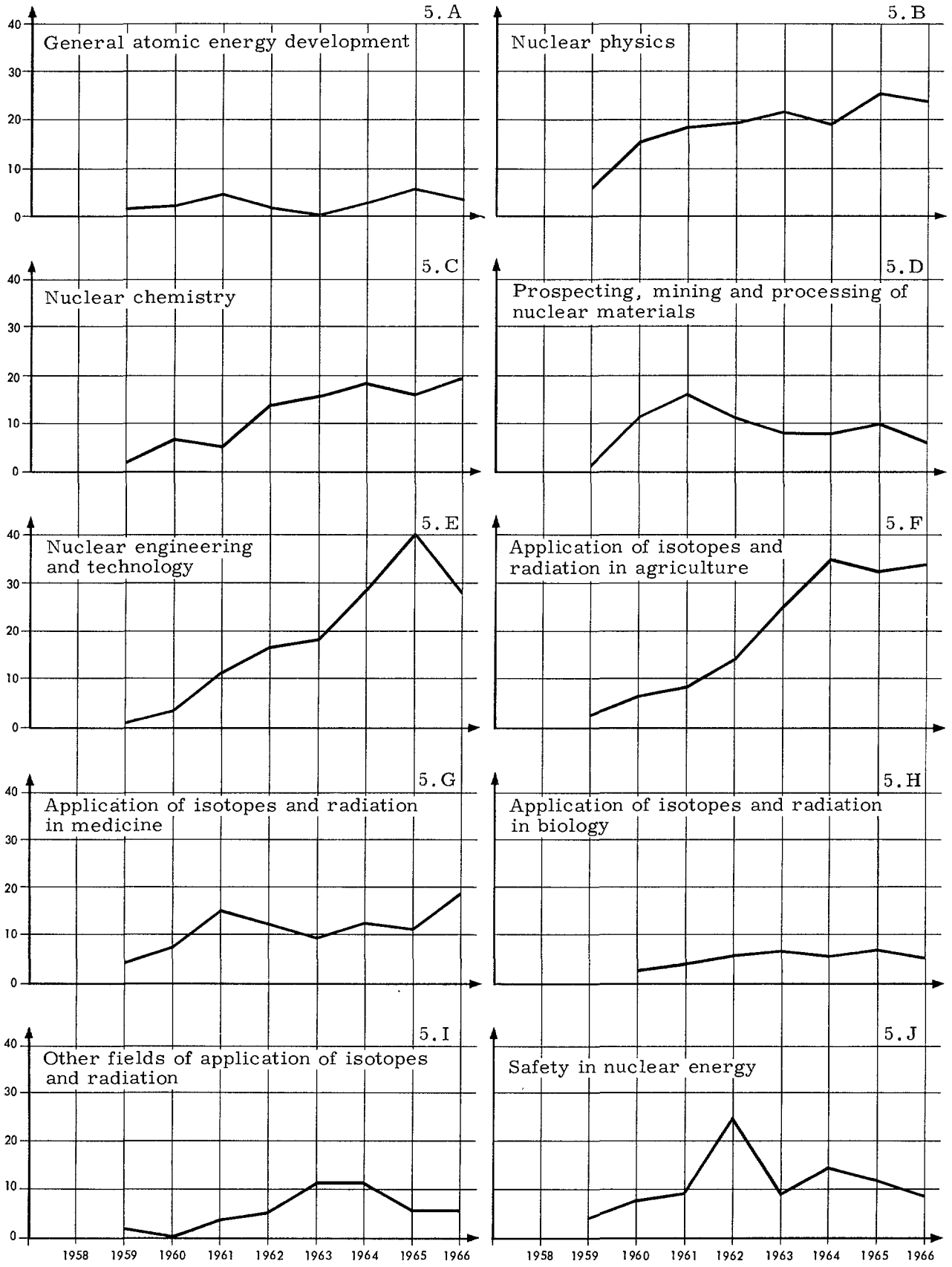


TABLE 6

Distribution of regional training courses by FIELD OF ACTIVITY (Number of courses/Number of lecturers/Number of participants)

Field of activity	1958			1959			1960			1961			1962			1963			1964			1965			1966			1958-1966		
	(1)	(2)	(3)[a]	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
General atomic energy development	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4	23	-	-	-	-	-	-	1	21	48	3	25	71
Nuclear physics	-	-	-	-	-	-	-	-	-	-	-	-	1	7	27	1	-	11	2	8	68	-	-	-	1	8	40	5	23	146
Nuclear chemistry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	10	-	-	-	-	-	-	-	-	-	1	1	10
Prospecting, mining and processing of nuclear materials	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nuclear engineering and technology	-	-	-	-	-	-	-	-	-	-	-	-	1	19	20	-	-	-	2	5	28	1	-	14	1	2	12	5	26	74
Application of isotopes and radiation in agriculture	-	-	-	2	19	21	1	2	9	2	18	31	3	20	57	1	5	19	3	8	34	7	19	107	2	6	21	21	97	299
Application of isotopes and radiation in medicine	-	-	-	-	-	-	1	1	5	-	-	-	1	5	12	3	16	39	1	6	14	1	-	15	1	11	14	8	39	99
Application of isotopes and radiation in biology	-	-	-	-	-	-	-	-	-	1	6	19	-	-	-	-	-	-	1	8	21	-	-	-	1	3	18	3	17	58
Other fields of application of isotopes and radiation	-	-	-	-	-	-	-	-	-	2	12	28	-	-	-	2	9	27	2	7	30	1	3	11	5	16	53	12	47	149
Safety in nuclear energy	-	-	-	-	-	-	-	-	-	2	8	30	-	-	-	-	-	-	-	-	-	2	8	38	-	-	-	4	16	68
TOTAL	-	-	-	2	19	21	2	3	14	7	44	108	6	51	116	10	35	129	11	42	195	12	30	185	12	67	206	62	291	974

a/ (1) Number of courses.

(2) Number of lecturers.

(3) Number of participants.

TABLE 7

Distribution of technical assistance: 1958-1966

by TYPE OF ASSISTANCE

(in thousands of dollars)

Expenditure in	Experts[a]		Equipment[a]		Fellowships[a]		Total[a]	
	$	%	$	%	$	%	$	%
1958	6.4	2	-	-	390.6	98	397.0	100
1959	47.8	6	10.2	1	775.4	93	833.4	100
1960	362.3	20	298.9	16	1 167.3	64	1 828.5	100
1961	575.2	26	271.7	12	1 401.3	62	2 248.2	100
1962	861.8	37	463.0	20	1 023.5	43	2 348.3	100
1963	818.2	33	432.4	17	1 232.1	50	2 482.7	100
1964	1 081.4	32	875.9	26	1 435.4	42	3 392.7	100
1965	983.5	35	627.1	22	1 205.7	43	2 816.3	100
Expenditure 1966 per 30 Nov. 1966	950.8		500.5		1 012.6		2 463.9	
Unliquidated obligations per 30 Nov. 1966	550.3		459.6		528.6		1 538.5	
Total per 30 Nov. 1966	1 501.1	38	960.1	24	1 541.2	38	4 002.4	100
GRAND TOTAL 1958-1966	6 237.6	31	3 939.3	19	10 172.5	50	20 349.4	100

a/ The figures include technical assistance provided under UNDP/TA and UNDP/SF (monetary and estimated in kind), both under the Country and the Regional Programme (Training courses).

CHART 7.A

Trends in the technical assistance activities of the Agency (including Special Fund)
(in percentages)

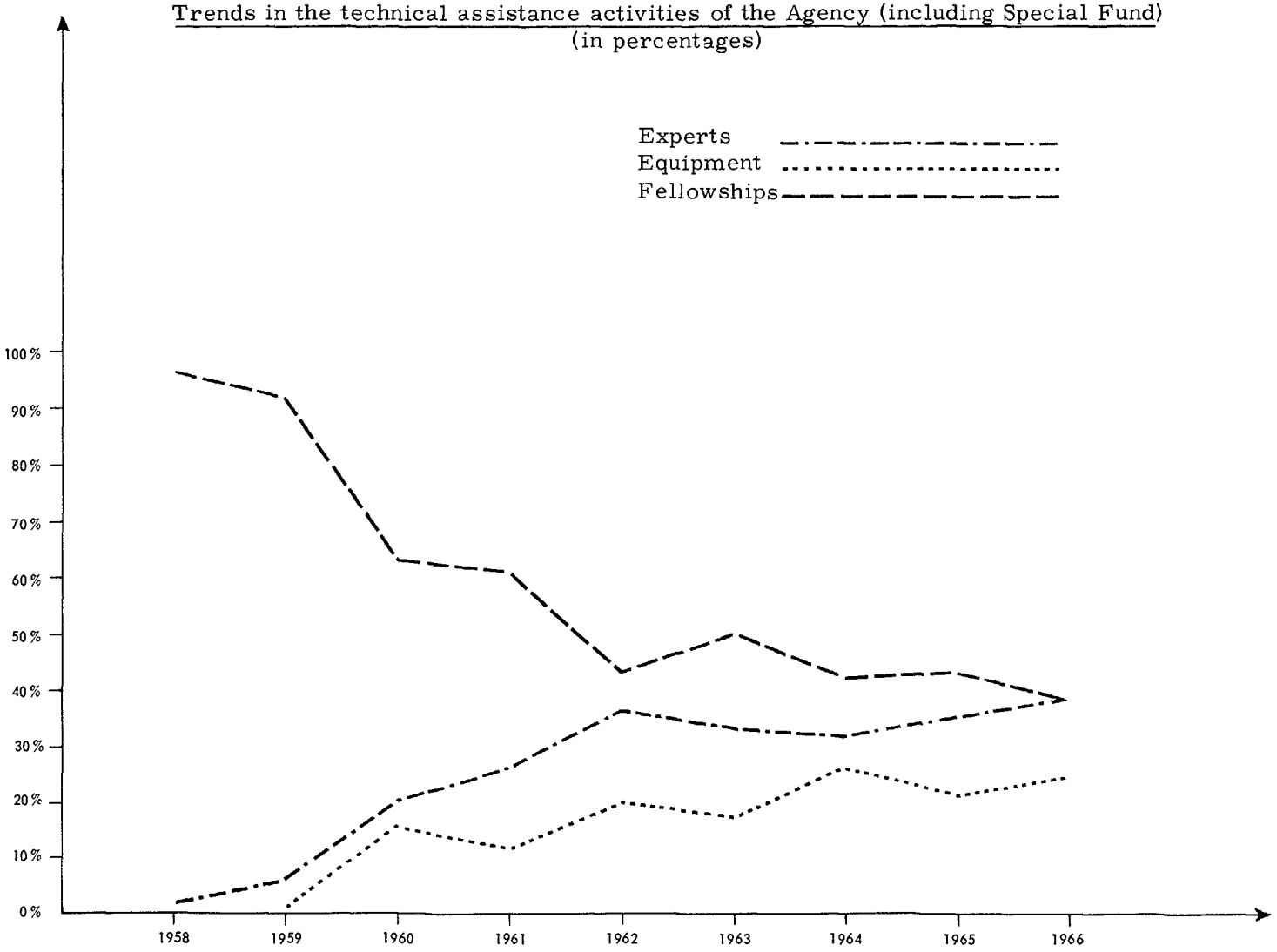
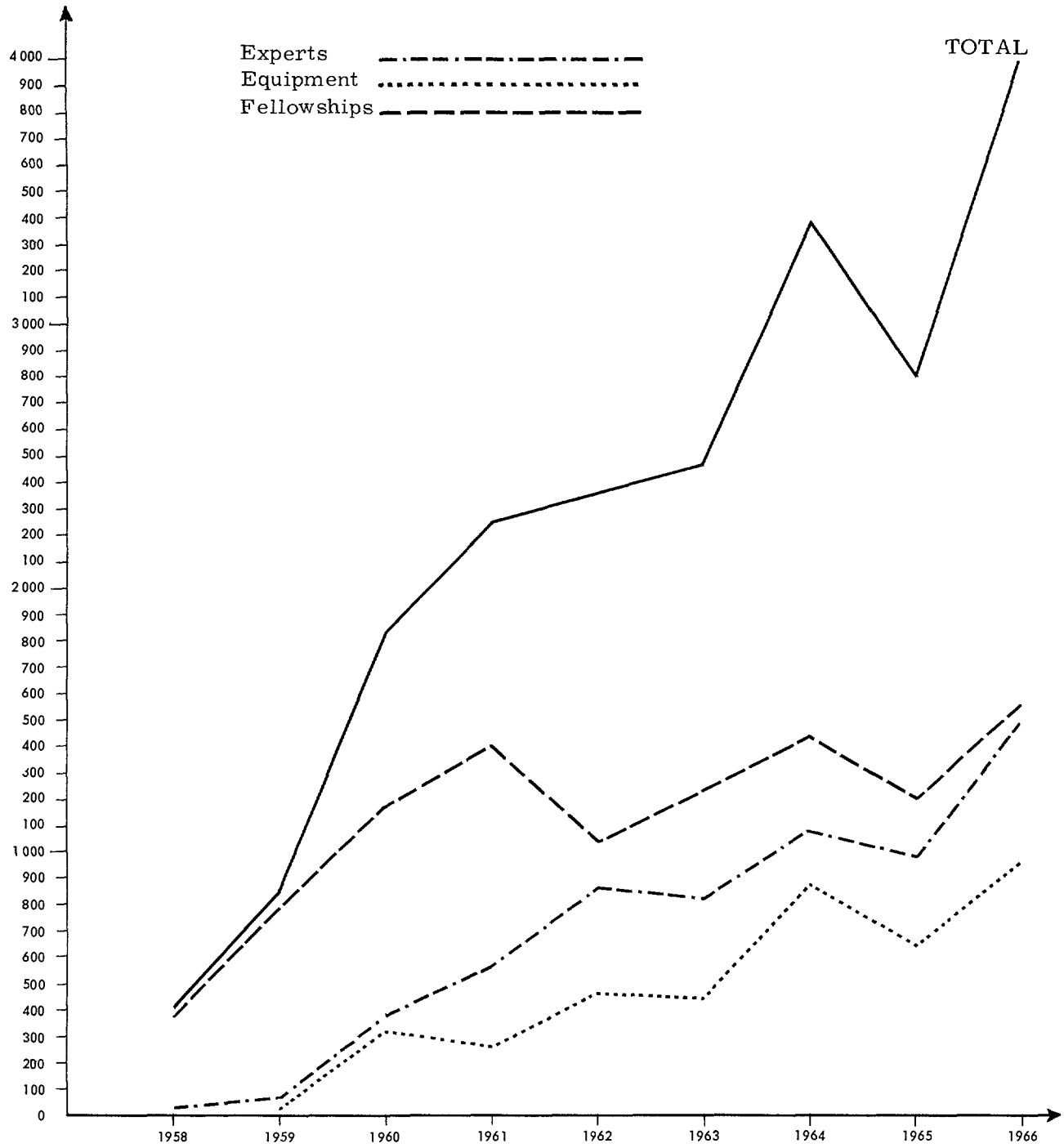


CHART 7.B

Trends in the technical assistance activities of the Agency (including Special Fund)
(in thousands of dollars)



B. NUCLEAR POWER AND REACTORS

68. The programme, besides generally facilitating the exchange of information on the technology and economics of nuclear power, places considerable emphasis on providing assistance to Member States which are preparing for the introduction of nuclear power, especially developing countries. Some of the work can be classified as relating clearly either to nuclear power or to research reactors. Other work such as that dealing with safety, fuel supply and information is relevant to both power and research reactors.

69. The main themes of panel meetings have been fuel-cycle problems, desalination, source material developments, special safety problems and special technological aspects of reactor developments. A review of the 17 panels held or to be held on such topics during the period 1965-67 shows that all but two of them are of interest to those developing countries that have an immediate interest in nuclear power. Most of them are of even greater interest to "advanced" countries having major nuclear power programmes, but two of the panels are predominantly "developing country oriented". Few if any of the panels were or will be of interest to every Member State. The same generalization may be made with respect to the technical and scientific symposia dealing with nuclear power reactors.

70. It is through such technical meetings, panels and symposia, with the resultant personal contacts and exchange of information, that the Agency can best serve the "advanced" countries in the field of reactor technology; its resources are insufficient to permit a direct contribution to technological development.

Nuclear power and economics, desalination

(a) Power survey and nuclear desalination missions

71. Such missions study when and to what extent nuclear power should be introduced into the requesting country's electricity system, taking into account all economic and technical factors and alternatives.

72. All requests have been met and power or desalination missions sent to the following Member States, all but one of which are "developing countries" [17].

Finland	1960
Philippines*	1960
El Salvador*	1962
Pakistan*	1962
Thailand*	1962
Republic of Korea*	1963
Tunisia*	1963 [18]
Turkey*	1965
Chile*	1966 [18]
Peru*	1966 [18]

(b) Special assistance

73. This consists of a more detailed and comprehensive study of nuclear power prospects or of a particular aspect of the proposed nuclear power project. This type of aid has been given only to developing countries, viz.:

---

[17] The exception, Finland, was actually on the list of recipients under the relevant United Nations programme at that time.

[18] Studied dual-purpose power and desalting plants.

Philippines* - Pre-investment study on power including nuclear power in Luzon undertaken by UNDP to determine the economically optimal pattern of electric power supply for the Luzon grid between the years 1965 and 1975;

Pakistan* - A panel of international experts arranged in July 1964 to help assess three tenders submitted by reactor manufacturing countries for the 70-MW(e) Rooppur nuclear power project in East Pakistan; and

Argentina* - The provision of assistance, in July 1965, in the national evaluation of some cost aspects of a feasibility study for a nuclear power plant for the Buenos Aires littoral area.

(c) Economic studies

74. Besides the preparation of annual summaries of available nuclear power cost data, a special effort has been made to analyse the methods of estimating costs, essential for understanding raw cost figures. Technical reports, such as "The Introduction to Methods of Estimating Nuclear Power Costs" (1961), and "Costing Methods for Nuclear Desalination" (1966), while of universal interest, are especially useful to countries that are contemplating embarking on nuclear power or desalting programmes.

(d) Courses and study groups

75. Training courses are dealt with in section A, paragraphs 54 and 55, and Table 6.

76. The first nuclear power study group meeting was held in 1966 on Prospects and Problems of Nuclear Power Application in Developing Countries, with special reference to Asia (Manila, October 1966). Thirty-four out of 52 national participants came from developing countries in the region.

(e) International desalination projects

77. Since October 1965, the Agency has been co-ordinating and supporting a joint preliminary study with Mexico* and the United States of a possible nuclear power plant to supply fresh water and electricity to the arid region on both sides of the western frontier between these two countries. Here one developing and one advanced country are involved.

78. The Agency also took part as an observer in detailed studies of desalting projects in 1965 and 1966 in two other developing States, namely Israel* and the United Arab Republic*, and is currently carrying out a study in a third, Greece*, of alternative means of supply of water and power in the Athens area. The study in each of these three cases is or has been made in partnership with the United States.

79. Under the desalination agreement between the Soviet Union and the United States, the Agency is receiving for distribution to all its Member States copies of the papers exchanged between the two countries.

80. The two nuclear desalting plants now being built are both in technically advanced countries and research and development work is also proceeding in a number of other technically advanced countries. To keep in touch with this, the Agency convenes a panel, usually once a year, bringing together experts from all interested Member States. This panel activity is thus "universally oriented".

Reactor safety

(a) Advisory missions on reactor safety

81. These missions of three to five experts usually spend a week to a fortnight in the requesting country.

(i) Reactor siting

82. Siting missions study all factors that can affect the safety of a particular reactor site, and prepare a report for the requesting country. All seven reactor siting missions the Agency has arranged have been sent to developing countries, viz.:

Yugoslavia*	1961
Pakistan*	1962
United Arab Republic*	1963
Philippines*	1965
Republic of Korea*	1965
Tunisia*	1965
Taiwan*	1966

(ii) Reactor hazards evaluation

83. Reactor hazards evaluation missions study the hazards evaluation report of the project in question and conduct hearings with all persons responsible for designing, administering and operating the project; prepare a report to the requesting Government on the degree of safety achieved and, as appropriate, make recommendations on this matter. Such missions have been sent to three developing and three technically advanced countries, viz.:

Switzerland	1960
Netherlands	1961
Thailand*	1962
Philippines*	1962
Pakistan*	1962
Netherlands	1964
Spain	1966

In three of the four missions to "advanced" countries, all costs except those of Secretariat participation were met by the requesting country; the fourth mission to an "advanced" country was carried out in connection with an Agency project and hence, under Article XIV.B.1(b) of the Statute, the costs were borne by the Agency.

(iii) Diverse activities

84. In 1966, the Agency was asked for the first time to take part in the hearings held by a national safety committee, namely the Pakistan Safety Committee meetings on the safety evaluation of the KANUPP reactor.

(b) Transfer of fuel

85. The Statute requires the Agency to make safety evaluations of projects involving the transfer of fuel under Agency auspices and also requires the costs involved to be borne under the Administrative Budget (Article XIV.B.1(b)). In accordance with this legel requirement, safety evaluations have been made in the following nine countries, of which five are classified as developing:

Austria	Philippines*
Finland	Spain
Iran*	Thailand*
Mexico*	Yugoslavia*
Norway	

(c) The Vinča dosimetry experiment

86. A special project undertaken in April 1960 was on dosimetry at the Boris Kidrič Institute of Nuclear Science, Vinča, Yugoslavia*, to determine the doses received by persons involved in an accident - a brief uncontrolled run of the zero-power reactor at that institute in October 1958. The experiment was organized as an international co-operative project forming part of the world-wide effort to determine the harmful effects of radiation on man.

Supply of special fissionable and source material

87. The Statute provides for the Agency to supply source and special fissionable materials, on request, to any Member State of the Agency [19].

88. Special fissionable material has been made available by the Soviet Union (50 kg of contained uranium-235), the United Kingdom (20 kg of contained uranium-235) and the United States (5070 kg of contained uranium-235, 5 kg of uranium-233 and 3 kg of plutonium). Source material has been made available by several Members.

89. So far, the following 17 Member States, 12 of which are classified as developing countries, have made use of this service:

Argentina*
Austria
Congo, Democratic Republic of*
Finland
Greece*
India*
Iran*
Japan
Mexico*
Norway
Pakistan*
Philippines*
Romania*
Spain
United Arab Republic*
Uruguay*
Yugoslavia*

90. Fifty-six deliveries of materials had been requested by the end of 1966. [20]

Reactor research

(a) Joint projects

91. These are intended to bring together scientists from several centres; stimulate exchange of information; prevent duplication; and generally work towards a co-ordinated goal that may not be achievable in a smaller project.

(i) NORA project [21]

92. The main objective has been to improve the understanding of the physics of a particular type of reactor, namely the light- or heavy-water-moderated, slightly enriched uranium dioxide system. Eleven countries, of which six are classified as developing countries, have provided scientists for the project.

---

[19] See Articles IX, XII and XIII.

[20] See document INFCIRC/40/Rev.4.

[21] INFCIRC/29 and Add.1 and 2.

(ii) NPY project [22]

93. This is a joint research programme in reactor physics carried out by Norway, two developing countries (Poland* and Yugoslavia*) and the Agency, which started in 1963. The three countries have found their programmes in reactor physics were sufficiently complementary to admit of a useful co-operative effort.

94. In association with this project, the Agency has held two Advanced Reactor Physics Schools which afforded a unique opportunity to discuss reactor physics problems with leading experts in the field. The first, the Zakopane (Poland) Advanced Summer School in September 1964, was attended by 40 participants from 23 countries (18 from developing countries). The second, the Sandefjord (Norway) Advanced Summer School in August 1966, was attended by 40 participants from 27 countries (20 from developing countries).

(iii) IPA project [23]

95. This is a project carried out by two developing countries - India* and the Philippines* - and the Agency, for the benefit of the countries in the region. It provides training and research in solid-state physics, based on a crystal spectrometer given by the Indian Atomic Energy Establishment for use with the Philippine reactor. A second spectrometer is nearing completion.

(b) Study groups on research reactor utilization

96. Since 1962 the Agency has held nine such study groups, listed in Table 8 below, each of which has been specially oriented to meet the needs of developing countries, particularly those with small or moderate-sized programmes. In this connection it should be noted that there are now about 25 countries which possess only one reactor. The participants exchange experience with scientists from neighbouring countries and from advanced centres. The earlier meetings were general in character; they have now become more specialized.

---

[22] INFCIRC/55.

[23] INFCIRC/56, and Add. 1.

TABLE 8

Study groups on research reactor utilization

Date	Place	Topic	Total number of participants[a/]	Participants from host country	Participants from developing countries other than host country
1962	Thailand*	General	46	10	25
1963	Brazil*	General	156	99	21
1963	Philippines*	Operating problems, isotope production, activation analysis	52	20	14
1963	Greece*	General	78	32	20
1964	Romania*	Experimental techniques	57	15	11
1964	India*	Reactor physics, radiochemistry	36	11	9
1965	Turkey*	Irradiation techniques	37	10	3
1965	Venezuela*	Operating and maintenance problems	31	8	10
1966	Australia	Solid-state physics and hot atom chemistry	50	20	20

a/ The total number of participants includes observers, Agency staff and outside experts.

(c) In-pile dosimetry

97. The Agency has had panel meetings on this subject in 1964, 1965 and 1966, resulting in the preparation of two guidebooks on the measurement of irradiation inside reactors. These books should be particularly valuable for the new reactor centres, although their utility is not confined to any group of countries.

Special publications and information

98. The directory of nuclear reactors, of which Volume VI has now been published, gives comprehensive information on power and research reactors in Member States. Complementary to this is the Reactor Card Index containing essential data on all reactors and intended chiefly for quick reference.

99. The Agency also publishes reports on, for instance, "Operating Experience of Power Reactors in Canada and the United States", in which the knowledge gained in pioneering the technology is communicated to countries planning to use the same types of plant.

C. RADIOISOTOPES AND RADIATION SOURCES

Food and agriculture

100. Over 90% of the Agency's activities in food and agriculture are oriented in favour of developing countries.

101. This work, which is carried out jointly with FAO through the Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture, is primarily designed to help apply nuclear tools in research leading to increased production of high quality food and to prevent food losses through insects and pests.

102. Almost every major field of food and agriculture is dealt with. Thus international programmes have been established in soil fertility and water supply, crop nutrition, plant breeding, insect control, animal production, food preservation, and in food protection.

103. Realizing the urgent need for increasing the production of the world's major food resources, particularly in the developing countries, the Agency has placed considerable emphasis on rice, the staple food in Asia and an important crop in nearly all parts of the world. With a view to finding more efficient ways of utilizing fertilizer in rice soils the Agency has been organizing uniform field experiments under its research contract programme for the past five years in the following ten developing countries: Burma*, Ceylon*, China*, India*, Madagascar*, Pakistan*, the Philippines*, the Republic of Korea*, Thailand*, and the United Arab Republic*. Hungary* and Italy have also participated in this programme. The scientists participating in it met at annual co-ordinating meetings held in the Philippines* (1962), Japan (1964), the United Arab Republic* (1964), Thailand* (1965) and Hong Kong (1966).

104. With a view to finding a better means of using radiation-induced mutations for improving the productivity of the rice crop the Agency organized a parallel, co-ordinated programme of research based on research contracts in the following developing countries: Brazil*, Ceylon*, China*, India*, Pakistan*, the Philippines* and Thailand*. Japan also participates in this programme. Uniform international tests of rice mutants are carried out in these countries, and the participating scientists met at annual co-ordinating meetings in Thailand* (1965), the Philippines* (1966) and China* (1967).

105. Regional rice advisers have been hired to guide both the fertilizer and mutation projects in South East Asia.

106. New radiation-induced mutant varieties of wheat, another staple food crop, are tested in uniform international trials in the following developing countries: Cyprus*, Greece*, India*, Iran*, Israel*, Lebanon*, Libya*, Syria*, Tunisia*, Turkey*, and the United Arab Republic*. These mutants were produced in Italy, which also participates in the programme.

107. The Agency also assists countries in Africa and Latin America in inducing resistance to wheat diseases through mutation, and it is planned to organize studies on the efficient use of fertilizers in wheat soils in developing countries.

108. A third major crop, maize, is being dealt with mainly in Latin America and Africa, where co-ordinated steps are also being taken to study the effective use of fertilizers, using isotopes, in the following developing countries: Argentina*, Brazil*, Colombia*, Ghana*, Mexico*, Peru*, Romania*, and the United Arab Republic*. The participating scientists have met at annual co-ordinating meetings in Lima, Peru* (1965), Bogotá, Colombia* (1966), and Piracicaba, Brazil* (1967).

109. Another important group of food plants is represented by tree crops, which are of considerable economic importance to many developing countries in which cereals are not of major importance. A co-ordinated programme on the use of radioisotopes to study nutritional requirements of tree crops is being initiated. Kenya*, the Philippines*, and Tunisia* already participate, and Ceylon* and Spain are expected to do so shortly. Coconut, oil palm, coffee, olive and citrus will be among the crops studied. Interested scientists from developing countries met at a panel in 1965 to draw up the plans for the programme.

110. Agricultural productivity in a great number of developing countries suffers from the lack of an adequate supply of water and its inadequate distribution in the soil. Using the unique method of neutron-scatter measurements, the Agency has established a series of projects to study soil moisture in the following developing countries: Iraq*, Israel*, Kenya*, Lebanon*, Morocco*, Pakistan*, and the United Arab Republic*. Belgium and Germany also participate in this programme, and the scientists concerned have been called together to discuss results and plan further activities.

111. Scientists from 12 developing and "advanced" countries jointly participate in a co-ordinated research programme to find more efficient ways of using radiation to induce beneficial mutations in crop plants and to utilize them in the production of high-yielding and disease-resistant varieties of any crop plant. The laboratories concerned carry out the work for the Agency free of charge.

112. In the Agency's efforts to reduce losses of food in the field and in storage caused by insects and other pests, a number of projects have been established which are all oriented in favour of developing countries.

113. In the control of insects, radiation is applied in using the sterile-male technique in an attempt to eradicate, for example, the Mediterranean fruit fly in parts of Central America, the olive fly in the Mediterranean area, and the tsetse fly in Africa. The Mediterranean fruit fly causes serious economic damage in at least 20 developing countries and the tsetse fly prevents animal production in enormous areas in Africa.

114. The Agency has supported research projects concerned with radiation applications for insect control in the following countries: Belgium, Costa Rica*, El Salvador*, Greece*, Israel*, Italy, Japan, Pakistan*, Republic of Korea*, Rhodesia (through the United Kingdom), Thailand*, Tunisia*, and the United Arab Republic*. Scientists engaged in this work have attended a number of meetings; these were held, for example, in Greece* (1963), Israel* (1966) and the Philippines* (1966).

115. Insects devour up to one third of the grain crop in storage in many developing countries. Chemical control of the insects is costly and leaves harmful residues on the grain. The Agency has sponsored special investigations to study the feasibility of radiation disinfestation of stored grain and other crops in the following developing countries: Algeria* (1965), Argentina* (1964 and 1967), Chile* (1966), India* (1967), Lebanon* (1965), Pakistan* (1963 and 1967), Peru* (1966), Thailand* (1967) and Turkey* (1964).

116. A pilot radiation grain disinfestation facility is being supported by UNDP/SF in Turkey under the operational management and technical supervision of the Agency. This should give operational and commercial data of value to many developing countries.

117. Studies on the preservation of fish and other food products by radiation are under way. A panel dealing with the application of these techniques in developing countries was held in 1964. The Agency has supported research on various aspects of food preservation by radiation in the following countries: Chile*, Greece*, India*, Israel*, Pakistan*, Philippines*, Spain and Thailand*.

118. Further extensive damage to agricultural production occurs through internal parasites of livestock and is particularly severe in tropical and semi-tropical developing countries. Radiation-produced vaccines are an effective means of combating these diseases. The Agency has organized co-ordinated studies in eight developing and "advanced" countries to gain further knowledge in this field and to promote this unique method of control. Specialists have been requested to attend two meetings to review progress and plan further activities.

119. To assist developing countries in making effective use of research reactors as a source of neutrons in seed irradiation, the Agency has initiated co-ordinated research projects in India*, the Philippines*, and Thailand*. The Agency's Laboratory at Seibersdorf plays an active part in developing and testing standardized methods of exposure and dose determination. A number of additional countries are expected to join in this programme.

120. In an effort to increase the production of major food crops it is essential to collect and make available information concerning crop varieties and strains. The Agency is co-operating with FAO in establishing accurate, computerized files of superior radiation-induced mutants and other breeding material which is expected to be of particular significance in breeding high-yielding crop plants in developing countries.

121. For training scientists in the application of radioisotopes and radiation in agricultural research, the Agency together with FAO has, between 1962 and 1967, sponsored 15 international or regional courses (listed in the table below), in which the majority of the participants have come from developing countries. Where facilities permitted, a number of these courses were actually held in developing countries.

TABLE 9

International or regional courses on the application of isotopes and radiation in agricultural research

Date	Place	Topic of training course
1962	Cornell, Ithaca, USA	The use of radioisotopes and radiation in the animal sciences
1962	Cincinnati, USA	Surveys of radionuclides in foods
1962	Ankara, Turkey*	The application of radioactive isotopes in soil-plant relations
1963	Florida, USA	The use of radiation and isotopes in entomology
1963	Ankara, Turkey*	The application of radioactive isotopes in soil-plant relations
1964	Brazil*	The application of radioisotopes in soil-plant relations
1964	Seibersdorf, Austria	The use of radioisotopes in agricultural biochemistry
1965	Hanover, Federal Republic of Germany	The use of radioisotopes and radiation in forestry research
1965	Cornell, Ithaca, USA	Radioisotopes in animal science and veterinary medicine
1965	Florida, USA	The use of radioisotopes in entomology
1965	Austria	Surveys for radionuclides in food
1965	Bogotá, Colombia*	The application of radioactive isotopes in soil-plant relations
1966	Manila, Philippines*	The use of radioisotopes in soil and plant investigation
1967	Michigan, USA	Food irradiation technology
1967	Florida, USA	The use of radiation and radioisotopes in entomology

122. The Agriculture Section of the Agency's Laboratory plays an essential role in the servicing of the programmes, and virtually all its work is of direct concern and value to the developing countries. It provides supporting analytical, irradiation and other services.

123. For example, the Laboratory undertakes nitrogen-15 and phosphorus-32 analyses for those participants in the soil fertility programmes who have not complete facilities. It also supports the mutation breeding programmes by providing mutagenic treatment services. Work in entomology has led to cheaper rearing media for the Mediterranean fruit fly, and this development is being put into effective use in the Special Fund Project for the Eradication of the Mediterranean Fruit Fly in Central America. In practical terms this has meant an estimated saving of $100 000 on the cost of the project. Future projects in developing countries will also benefit.

124. The Laboratory offers training, under the Agency's fellowship programme, in the application of isotopes and radiation to soil-plant studies, entomology and mutation breeding. At all times there are a number of fellows from developing countries receiving training at the Laboratory. Many of the fellows have been associated with a research contract carried out under the Agency's research contract programme. This had led to close contacts with contractors in the developing countries.

125. With regard to research support, which is analysed in section G below, it should be noted that, in addition to the 66 Agency-supported research contracts in operation at the end of January 1967, 29 "cost-free" research agreements were being implemented in various fields of food and agriculture at that time. While the latter agreements involve no expenditure by the Agency, they often involve very considerable expenditure, for the benefit of developing countries, by the laboratories carrying out the work in question.

Medicine

126. The Agency promotes the use of radioisotopes in diagnosing disease and in studies of the processes of the human body, and deals with the use of radiation in the treatment of disease. The work is of general benefit but is of special interest to developing countries, helping them to utilize techniques that are already widely used in "advanced" countries. The following is a summary of the 1964-66 programme.

(a) Panels

127. Six panels were held, one entirely "developing country oriented" (radioisotope techniques in the study of protein metabolism - especially in malnutrition studies), one chiefly of interest to developing countries (planning of radiotherapy facilities), while the remaining four were of universal interest.

(b) Consultants' meetings

128. All three consultants' meetings were "universally oriented".

(c) Special missions

129. These consisted in each case of a visit by an individual staff member. Of the 70 missions carried out, 51 were to developing countries.

(d) Nuclear medicine information service

130. This service, which consists chiefly of distributing lists of references relating to nuclear medicine every three months, is now sent to 306 individuals in 50 developing countries and to 659 individuals in 25 "advanced" countries. Since 1964, the Agency has also been supplying isodose charts and other data relating to radiation. Of the 85 orders covering approximately 1400 items executed from 1964-66, 7 orders covering approximately 100 items were for developing countries.

(e) Thyroid radioiodine uptake measurements

131. From 1962-66, 190 medical institutions in 40 countries were visited for the purpose of examining the techniques used for measuring thyroid iodine uptake and helping to calibrate and standardize these techniques. Of these institutions, 113 were in 26 developing countries.

(f) Distribution of labelled proteins under the "Co-ordinated Research Programme on the Use of Radioisotopes in the Study of Malnutrition in Tropical and Subtropical Regions"

132. In support of the relevant research contracts (see section G below) the Agency's Laboratory labels and the Agency distributes protein preparations to laboratories abroad

to enable them to check the adequacy of their own labelled preparations. Of the 26 samples distributed, 19 have gone to 6 institutions in developing and 7 to 3 institutions in "advanced" countries.

(g) Lithium fluoride dosimetry

133. The Agency is establishing a radiation dose calibration service in which lithium fluoride capsule dosimeters will be sent to institutions in Member States and returned to the Agency for reading. This will be chiefly of interest to developing countries; a start has been made in Asia and the Far East in 10 developing and one "advanced" country.

(h) Laboratory activities

134. The funds available for medical work in the laboratories were $38 000 in 1964, $48 000 in 1965 and $74 000 in 1966. The main projects have included: whole body counting; thorotrast; calibration of iodine-131 in thyroid (see above); diagnostic applications of radioisotopes; medical activation analysis; thermoluminescent dosimetry, and training. Of these funds, the proportion spent on work oriented specifically in favour of developing countries has increased from approximately 33% in 1964 to 42% in 1966.

135. This calculation is based on the assumption that work on subjects such as protein metabolism in malnutrition is specifically of interest to developing countries, while projects such as the study of the effects of long-term irradiation as a result of thorotrast administration are of universal interest.

Radiation biology

136. The main object of the programme is to obtain more information about the biological hazards that the general public and specific groups of workers may encounter from radiation exposure. A second object is to gain better information about radiation injury so that radiation may be used more effectively in medicine and industry and in solving fundamental problems in biology and agriculture.

137. While the programme is thus "universally oriented", the main means at its disposal, namely research contracts, are given chiefly to developing countries and several other activities are of special interest to developing countries.

138. Of the six panels and study group meetings held in 1966, three dealt with subjects of basic research (relating to the effects of ionizing radiation on haematopoietic tissue, genetical aspects of radiosensitivity, and automation of Karyotype analysis respectively), two were of considerable interest to developing countries and well attended by them (both dealt with radiosterilization of medical products and with guidance and advice to developing countries on this subject), while the sixth was very specifically "developing country oriented", being intended to develop the Agency's programme for training of scientists in radiobiology.

139. The sole training course held in 1966 in this field took place in a developing country (Yugoslavia*) and 17 out of the 25 participants were from developing countries (Bulgaria*(1), Chile* (2), Cuba* (1), Hungary* (1), India* (2), Syria* (2), Venezuela* (2), Viet-Nam* (1), and Yugoslavia* (5)). Thus a subject that may at first appear to be of little direct interest to developing countries - macromolecular aspects of radiobiology and recovery of irradiated organisms - does in fact attract many scientists from these countries.

140. Other activities of the programme in 1966-67 included assisting in the establishment of a Bone Bank in Vienna, compilation of a compendium on "Marine Radioecology" which included contributions from laboratories in Iceland*, India*, Israel* and Yugoslavia*, and a work on the use of radioisotopes in biology for inclusion in a UNESCO textbook for use in developing countries.

Hydrology

141. A reliable supply of water is one of the most urgent requirements in most developing countries and at least three quarters of the Agency's activities in hydrology are closely linked with the provision of assistance in one form or another to developing countries to help develop water resources through the use of isotopic methods.

142. The programme consists of three parts, as explained below:

(a) In a relatively new technique of this kind, much effort must be spent on developing further the technique itself and on planning appropriate work for the Agency. Of four limited participation meetings held during 1964-67, one (in France) was designed for this purpose;

(b) Radioisotope techniques are an invaluable adjunct in studies of the hydrology and meteorology of the whole world, thus giving information about the weather, the main rivers of the world, the water balance of continents and of the various climatic zones. This part of the Agency's work consists of assisting in two major programmes of other United Nations agencies, viz:

(i) The World Meteorological Organization, in co-operation with which samples of rainfall and other precipitation received monthly from a world network of 150 stations are analysed in the Agency's Laboratory. The significance of this is that the data form the basis for interpretation of tritium analysis in underground and surface waters;

(ii) UNESCO, which, through the International Hydrological Decade, is trying to build up basic information of world-wide significance. The Agency helps, for instance, by taking responsibility for certain working groups, e.g. those using nuclear techniques in saturated and unsaturated zones; and

(c) The provision of direct help to Member States, which takes several forms, e.g.

(i) The Agency provides advice and laboratory analytical services to FAO in six UNDP projects in Jamaica*, Jordan*, Kenya*, Niger*, Spain and Turkey*.

(ii) The Laboratory makes isotopic analyses of samples sent in by Member States; about 65% of such samples are from developing countries;

(iii) Technical assistance activities of the Agency or of other agencies. A training course on applications of radioisotope techniques in hydrology will be held in Turkey from April to June 1967 by the Agency. It also provides lectures on radioisotope techniques in the training projects and seminars of other organizations, e.g. in three UNESCO training courses in 1966 (Turkey*, Iran*, and the Netherlands) and one in 1967 (Venezuela*).

Industry

143. The Agency's activities relating to the industrial applications of atomic energy, which are of benefit to developing countries, mainly consist of the transfer of knowledge and the provision of training. This is clear from the following examples of the work done in 1966.

144. A panel, held in Helsinki, Finland, in June 1966, helped to compile a guide on routine industrial applications, especially for the use of industry in developing countries.

145. An advisory mission on industrial applications visited China*, Pakistan*, the Philippines*, the Republic of Korea* and Thailand*, all of which are developing countries.

146. A consultants' meeting studied definitions and terms relating to neutron moisture gauges. The use of these gauges had been widely considered in developing countries for

the construction of roads, airports and dams, and they would also enable those countries to make efficient use of the limited water supplies available for agricultural purposes.

147. A regional training course on the industrial applications of radioisotopes was held in Mexico* with the sole purpose of providing in-plant training for nationals of Latin American countries.

148. A study tour devoted to the industrial applications of radioisotopes was carried out, during which the 15 participants, all from developing countries, visited a large number of industrial establishments in the Czechoslovak Socialist Republic, France, the Soviet Union and the United Kingdom.

149. Finally, about 95% of the advice provided by the advisory service on industrial applications was given to developing countries in response to requests made by them.

150. An example of work which is currently of interest to technically advanced countries but which may prove to be of benefit to developing countries was that done by a study group on terrestrial applications of radioisotope power generators in July 1966.

D. HEALTH, SAFETY AND WASTE MANAGEMENT

151. This work falls into four broad categories.

Category 1: Adoption or establishment of safety standards (basic safety standards, regulations and codes of practice) and publication of manuals of guidance and technical reports

152. This type of work involves collecting, studying and exchanging considerable quantities of information, as well as holding scientific meetings on nuclear safety topics.

153. As a rule, standards and manuals are "universally oriented". Certain of them are, however, specifically designed to help developing countries to set up correct safety procedures and/or to manage nuclear waste economically. The proportion of "developing country oriented" manuals is steadily increasing, as indicated in the Agency's Programme for 1967-68. [24]

154. Tables 10 and 11 below summarize work in this category during the period 1958-66:

TABLE 10

Panels and panel reports (1958-66)

Number of panels[a]	Broad area of topic	Number held in developing countries	"Universally oriented"	"Developing country oriented"
14	Health and safety	None	11	3
10	Waste Management	None	8	2

a/ This means the number of topics considered by panels, not the number of meetings, e.g. the many panels on transport are counted as one.

[24] GC(X)/333, part VII.

TABLE 11

Manuals of guidance and technical reports
(other than panels' reports)(1958-66)

Number	Broad area of topic	"Universally oriented"	"Developing country oriented"
15	Health and safety	10	5
3	Waste management	1	2

Category 2: Promotion and co-ordination of research on health, safety and waste management

155. This involves research contract awards (see section G below), research co-ordination meetings and the publishing of abstracts on research undertaken by national institutes in certain Member States.

156. Broadly speaking, this work has so far been "universally oriented". Research co-ordination meetings bring together chiefly those Member States that have significant research programmes in the topic concerned, and these are usually technically advanced countries. However, the eventual value of this type of work to developing countries is obvious. This programme of meetings involves relatively little expense, as the cost of participation is usually borne by the national authorities concerned. The following research co-ordination meetings have been held:

TABLE 12

Research co-ordination meetings

Subject	Place	Date
Waste management		
General	France	1964
Physical and chemical properties of materials used for fixing and solidifying radioactive waste	Soviet Union	1965
Treatment of radioactively contaminated organic liquids	Belgium	1966
Health physics		
General	Hungary*	1966
Treatment of aerosols and volatilization products during waste processing operations	Turkey*	1966

157. The Secretariat is considering for 1968 and succeeding years co-ordination meetings on waste management that would be entirely oriented in favour of developing countries. These meetings will bring together scientists from developing countries working on similar research and development problems in a given region, as well as some experts from technically advanced countries familiar with the latest techniques in this field.

Category 3: Training in health, safety and waste management

158. This is essentially for the benefit of developing countries. The programme is analysed in section A, but the following projects may be mentioned.

(a) Courses and seminars

159. The following training courses and seminars on health, safety and waste disposal were held:

TABLE 13

Subject	Place	Date	Participants from developing countries
Radiation, health and safety (jointly with WHO)	Japan	1961	9
Bio-assay of radio-nuclides	Austria (Agency Laboratory)	1963	7
Radiation protection in industry (jointly with ILO)	Denmark	1965	23
Waste management	Japan	1965	10

(b) Training films

160. These illustrate the use of Agency standards, manuals, etc. Of the four produced so far, one is "universally oriented": Safe Transport of Radioactive Materials (1964); and three are "developing country oriented", viz: Safe Handling of Radioisotopes (1962), Personnel Monitoring (1965), Waste Management for Radioisotope Users (1966).

Category 4: Field activities

161. This consists of technical assistance (see section A), Regional Study Group meetings and ad hoc advisory services.

162. The Regional Study Group meetings enable the Agency to promote regional co-operation in health, safety and waste management, promote the transfer of knowledge by bringing experts from "advanced" countries to give lectures, and bring together the Agency's technical assistance experts dealing with the safety problems in the region.

163. Two Regional Study Group meetings on radiation protection in health physics were held: one in Thailand* in 1965 which was attended by 15 participants from developing countries; the other one in Argentina* in 1966 with 18 participants from developing countries.

164. The ad hoc advisory service, in which ILO and FAO joined in 1964, and in which WHO is now informally taking part, was set up to advise Member States on any special problems that arise in radiation protection and waste management and that would not warrant or could not await arrangements under the technical assistance programme. Services are provided by experts from the staff of the participating organization, through correspondence or by advisory missions. The service thus complements the technical assistance programme. The increase in this service is reflected in the number of man-days of work involved, i.e. 75 in 1964, 125 in 1965 and 155 in 1966. This service is almost exclusively "developing country oriented".

E. RESEARCH AND SERVICES IN PHYSICAL SCIENCES

Physics

165. A very large part of the Agency's physics programme consists of promoting the exchange of information about the latest developments in physics directly relevant to the application of atomic energy for peaceful purposes. These include advances in reactor physics itself, as well as in other branches such as nuclear physics and solid state physics. For instance, any development that will yield more information about the basic nature of the fission or fusion processes, or the characteristics and behaviour of plasmas, is relevant to this work.

166. Most of these developments are taking place in the technically advanced countries and hence the Agency's role in this regard is chiefly that of promoting the fullest and freest exchange of information between these countries. Experience has shown that meetings under international auspices are particularly useful in this regard.

167. It must be borne in mind, however, that some developing countries, particularly in South Asia and Eastern Europe, have physics laboratories which are doing significant work, have made big contributions to the advance of physics, particularly in fields such as magnetohydrodynamics, and are themselves taking an active part in the Agency's programmes. Moreover, one or two of the physics programmes are specifically carried out for the benefit of the developing countries. Thus the Agency is engaged in compiling data on particle accelerators throughout the world with a view to launching a programme for the fuller use of charged particle accelerators, which exist in quite a large number of developing countries.

168. It is necessary to recall that the research and development taking place in advanced countries to-day lays the foundation for the techniques and technologies that will be essential for developing countries tomorrow. The history of the peaceful uses of atomic energy during the last two decades is an example of this.

Nuclear data

169. This is a specific example of promoting exchange of information in a field of nuclear physics. Most of the data is exchanged at present between "advanced" countries. With time, however, the net is gradually widening to include developing countries, two of which now take part in the work of the Agency's International Nuclear Data Committee of 12 experts. The Agency has also arranged for nuclear data liaison points to be set up in about 20 developing countries (which are already interested in acquiring nuclear data) and the Agency is circulating bibliographies, documents on the latest neutron research and other material to these countries. In fact, the nuclear data work is a good example of how an activity that was initially carried on entirely between Western European and North American countries is being gradually expanded, through the Agency's initiative, to include not only Eastern Europe but also developing countries in Asia, Africa, Latin America and the Far East that are now becoming increasingly interested in data exchange.

Chemistry

170. More than half the programme is designed to advance nuclear hot-atom and radiation chemistry in the developing countries. The remainder is chiefly designed to promote the exchange of information on the latest developments in chemistry directly relevant to the peaceful uses of atomic energy, as shown below.

(a) Study groups

171. The study groups on research reactor utilization [25] are taken up to a considerable extent with chemistry. Eight of the nine groups have been held in developing countries.

---

[25] See also para. 96 and Table 8 above.

Of the six panels on chemistry held from 1962 to 1967, two on reactor- and radiation-based chemistry were "developing country oriented" and four on thermodynamics of nuclear materials were "universally oriented".

(b) Special missions

172. All three special missions sent out from 1963 to 1966 have visited developing countries only (China*, Philippines*, Thailand* and Turkey*) to study problems arising in the work of their reactor centres. Two missions in 1967 will visit four developing countries.

(c) Publications

173. The programme consists of:

(i) Publishing a manual on the Most Efficient Methods of Isotope Production in Small Reactor Centres in Developing Countries, with special reference to the economics of such methods; and

(ii) Publishing monographs on thermodynamic data obtained as a result of panel meetings ("universally oriented").

(d) Advisory services

174. These have been given to reactor centres in six developing countries.

Seibersdorf and Headquarters Laboratory

175. The work relating to agriculture and hydrology done at the Agency's Laboratory at Seibersdorf and at Headquarters and its bearing on the developing countries has already been described. [26] The work done on other subjects is analysed below.

(a) Distribution of calibrated radioactive sources

176. During 1966, 448 samples of 18 different radioisotopes were sent to 36 institutes in 22 different developing countries (see Table 15 below). During the same period the total number of samples of those isotopes distributed was 1967, which were sent to 154 institutes in 43 Member States. It is therefore clear that the developing countries are already deriving considerable benefit from this service. In addition, four fellows from developing countries have been trained over the past few years.

(b) Low-level radioactivity work

177. Under a programme started in 1959 assistance has been rendered to all Member States in the planning and execution of pre-operational and operational reactor site surveys and food surveys for radioactive contamination. This assistance takes the form of analyses of samples, for example from air, rain, soil, plants, food and human material, submitted by Member States. A total of 9074 samples from 23 Member States has been analysed for radioisotopes, such as strontium-90, caesium-137, iodine-131, plutonium and uranium. A breakdown of the work is given in the following table:

TABLE 14

Number of analyses

Group of countries	Period			Total
	1959-1961	1962-1964	1965-1966	
Developing	358 (20%)	4366 (76%)	1461 (97%)	6185 (68%)
Advanced	1475 (80%)	1375 (24%)	39 (3%)	2889 (32%)
Total	1833	5741	1500	9074

[26] See paras. 122-124 and 143-142 above.

TABLE 15

Distribution of radioactive samples
to developing countries in 1966

Country	Samples	Isotopes	Institutes
Argentina*	24	12	1
Brazil*	43	12	3
China*	28	10	6
Cuba*	3	3	1
El Salvador*	8	8	1
Ghana*	3	3	1
Greece*	19	18	1
Hungary*	16	10	1
India*	4	4	1
Iran*	12	9	1
Iraq*	10	5	1
Israel*	54	15	5
Korea*, Republic of	21	15	1
Nigeria*	7	7	1
Pakistan*	8	8	1
Philippines*	11	9	1
Poland*	42	14	1
Romania*	59	16	1
Syrian Arab Republic*	18	9	2
Turkey*	26	11	2
Viet-Nam*	10	8	1
Yugoslavia*	22	10	2
Total	448	-	36

178. It can be seen from Table 14 that over the entire period since 1959 more than two thirds of the analyses, and in recent years almost all of them, were carried out for developing countries.

179. The standardization of methods of environmental radioactivity analysis, in co-operation with FAO, WHO and WMO, and the publication of a manual on methods of radiochemical analysis jointly with FAO and WHO while "universally oriented" should prove of special value to developing countries.

180. With regard to analytical quality control, for which there is a world-wide need, the service provided by the Agency has been used extensively by laboratories in developing countries, as shown in Table 16 below:

TABLE 16

Analytical quality control

Year	Countries				Countries where laboratories are situated				Countries ordering samples			
	Advanced		Developing		Advanced		Developing		Advanced		Developing	
	No.	% a/	No.	% a/	No.	% a/	No.	% a/	No.	% a/	No.	% a/
1964	20	65	11	35	130	89	16	11	509	86	87	14
1965	19	55	15	45	79	80	21	20	376	84	74	16
1966	23	70	10	30	132	87	17	13	589	78	167	22

a/ Percentage of total service provided.

181. The work relating to medical biochemistry is of universal interest, while that concerned with the preservation of food by using irradiation techniques is of particular interest to developing countries. In 1963-1965 three training courses were held in the bio-assay of radionuclides, the use of isotopes in agricultural biochemistry, and the organization of surveys for radionuclides in food respectively. In the following table, the overall training is analysed year by year:

TABLE 17

Number of fellows

Group of countries	1959	1960	1961	1962	1963	1964	1965	1966	Total
Developing	2	2	2	4	10	14	13	1	48
"Advanced"	-	4	1	-	4	1	8	-	18
Total	2	6	3	4	14	15	21	1	66

(c) Chemistry

182. There are several activities relating to chemistry which are useful to the developing countries, such as the preparation of reference samples. For example, reference samples of low-grade uranium ores are now being prepared, and eighteen developing countries have expressed their interest in this work. An effort is also being made to develop analytical methods to ascertain the purity of radiopharmaceuticals, and the results of this work will be of benefit both to the developing and the "advanced" countries.

(d) Assessment of work

183. A committee which recently reviewed the work done at the Laboratory at Seibersdorf and at Headquarters considered that the activities were appropriate to an international organization and could make a valuable contribution to the peaceful uses of atomic energy in developing and "advanced" countries. It further considered that the training activities, in particular the fellowship programmes, were very valuable and should be continued on at least the same scale as heretofore.

The Agency's International Laboratory of Marine Radioactivity in Monaco

184. The International Laboratory of Marine Radioactivity in Monaco is concerned with the behaviour of radionuclides in the sea and carried out the relevant studies in physics, chemistry, biology and sedimentology, with a view to determining the possible consequences arising from pollution of the sea by radioactive waste or fall-out. Its work is of interest to both developing and "advanced" countries, particularly those bordering on the sea or deriving a substantial portion of their food from the sea, and hence special attention is paid to the transport of radioisotopes through the food chain. Moreover, the staff is prepared to give advice to developing countries on any problems relating to marine radioactivity. Bi-annual meetings are held with scientists working in similar laboratories elsewhere, two of which are located in developing countries.

185. Of particular interest to the developing countries is the possibility of training young scientists in the techniques used for measuring radioisotope concentrations in the sea. A committee of experts has recently recommended that such training should be carried out and, furthermore, that the Laboratory should accumulate and disseminate information of importance to the study of marine radioactivity. The latter activity would also be of benefit to the developing countries.

186. It will be recalled that almost a third of the cost of the Laboratory is borne by one Member State, which also provides the laboratory buildings and the services of an oceanographic vessel free of charge.

International Centre for Theoretical Physics, Trieste

187. The provision of assistance to developing countries in the form of training of young scientists at the Centre during its first two years of operation, through the award of fellowships and participation in seminars and guided research, is shown in the table below as a percentage of the total activities of the Centre.

TABLE 18

Region	Developing countries	Percentage
Asia	9	17.46
Africa	3	4.86
Latin America	5	7.76
Europe	5	10.67
Totals	22	40.75

188. The remaining activities consist of co-operation by the Centre with the most "advanced" countries in Asia, Europe and the United States, which is also of indirect benefit to all Member States.

189. It should also be recalled that the host country currently bears 72% of the annual cost of the Centre, and that UNESCO makes a separate contribution equal to about a quarter of that of the Agency.

F. INFORMATION AND TECHNICAL SERVICES

Conferences, symposia and seminars

190. The object of the Agency's conferences, symposia and seminars is to enable scientists to exchange information on their latest research and development work and thus hasten the pace of advance and effect some co-ordination by eliminating duplication.

This emphasis on a full and free exchange of the latest research information has followed from the three major international conferences on the peaceful uses of atomic energy in Geneva in 1955, 1958 and 1964.

191. During 1958-1966 the Agency held 83 conferences, symposia and seminars attended by 12 457 participants, of whom 1884 were from developing countries. 16 of these scientific meetings were held in developing countries and 67 in "advanced" countries (37 at Headquarters). Broadly speaking, the division by topic was 70 "universally oriented" and 13 "developing country oriented".

192. The need has also grown for another type of meeting, educational in character, whose aim is to transfer information and experience from centres in "advanced" to those in developing countries. For this purpose, the Agency has been holding regional study groups since December 1962, initially on research reactor utilization and, more recently, also on nuclear power and radiation protection.

193. The following is a more detailed analysis of the 33 conferences, symposia and seminars held during the last three years - since the third Geneva Conference which marked the advent of commercial nuclear power and thus led to a change in the pattern of the information programme.

(a) Participation

194. Average attendance has been fairly steady at about 150 per meeting. Attendance from developing countries fell from approximately 17% in 1964 (175 out of 926 participants) to 15% in 1965 (318 out of 2039) and to 11% in 1966 (211 out of 1826).

(b) Location

195. Meetings are held abroad only if a Member State takes the initiative of inviting the Agency and meets the extra cost involved. However, if the host State is a developing country the amount of the contribution is subject to negotiation. The decision whether to hold a meeting at Headquarters, at a location in an "advanced" country or in a developing country must take into account the topic of the conference (and hence the audience sought) as well as the facilities available. Thus a meeting on fast reactors held at one of the half dozen centres developing this technology may attract greater participation than one held at Headquarters or elsewhere.

196. Of the 21 meetings held in 1964 and 1965, 14 were not held at Headquarters and six of those were held in developing countries. In 1966 very few invitations were received and, for the first time since 1959, none from a developing country. Since three meetings will be held in developing countries (Turkey*, Hungary* and Bulgaria*) in 1967, it appears that 1966 was exceptional in this respect.

(c) Effects of location on participation

197. A statistical analysis of the last three years could suggest that, when symposia are held in the developing countries, the only developing country whose participation increases is the host State. Leaving out the host State, the average number of participants from developing countries was less at symposia held in those countries than at symposia held in technically advanced countries (including Headquarters), as shown below.

TABLE 19

Average number of participants, per meeting, from developing countries (other than host country)

	1964	1965	1966
For meetings held in developing countries	10	12	-
For meetings held in "advanced" countries	20	12	20

198. There is a marked change if the host country is included. The six meetings held in developing countries (see paragraph 196 above) were attended by 699 participants, of whom 202 were from the host country and 70 from other developing countries. In one case, of the 222 participants 79 were from the host country.

199. The participation by developing countries other than the host country in 1964-66, expressed in percentages, was 14% for six meetings held in developing countries, and 10.4% for 27 meetings held in "advanced" countries.

200. The fact that percentage participation of developing countries is higher when the meetings are held in such countries while the average absolute participation is lower, is due chiefly to the fact that average total attendance at such meetings is lower than at those held in "advanced" countries.

201. The statistical samples given above are probably too few to warrant any conclusion other than that participation from other developing countries was not much affected by the question whether the host was an "advanced" or a developing country - in other words location has little influence.

(d) Effects of subject-matter on participation

202. The following shows the relationship between the topics of meetings and participation from developing countries. Since the time factor is not relevant, the period 1964-66 has been dealt with as a unit. To enhance the statistical value of the comparison - in other words to isolate the effect of topic from the effect of location - only meetings held at the same location, namely Headquarters, have been taken into account.

203. Of the 15 meetings held at Headquarters:

(i) Four have been considered to be of direct and immediate interest to developing countries;

(ii) Seven of interest to developing and "advanced" countries alike; and

(iii) Four of potential interest only to developing countries.

The percentage participation from developing countries at these meetings has been: (i) 17.7%; (ii) 10.3% and (iii) 6.7%. Thus, the effect of the topic chosen on participation by developing countries varied within a range of about 10%.

(e) Impediments to participation by developing countries

204. Participation by developing countries has been relatively low during the period 1964-66 and in the years before that. The foregoing analysis suggests that this participation is not markedly influenced either by choice of topic or by location, in the case of the developing host State.

205. It should be recalled that the term "developing countries" includes a very wide range of States, many of which do not yet have the scientific manpower that can fruitfully take part in specialized nuclear science meetings. Other developing countries are already engaged in major nuclear science and technology programmes and have large numbers of nuclear scientists and technologists. For countries of the first type the main impediment to participation is the level of development; for developing countries of the second type the main impediment may be finance.

206. The Secretariat is informed that, to meet the latter difficulty, IANEC arranges to pay the costs of one scientist, selected by IANEC, from each developing country in the region concerned. The Agency has adopted a similar course with regard to its regional study group meetings (referred to in paragraph 192 above). For a symposium open to all Member States this arrangement would, however, be extremely expensive.

207. It may be noted that the Agency itself invites to its symposia approximately 25 scientists each year as "discussion leaders", or an average of about two for each symposium. 20% of the invited discussion leaders have come from developing countries. Since the emphasis in the meetings has been on the highest possible scientific content and attendance, the discussion leaders have been either authors of requested review papers or particularly eminent scientists whose attendance is desirable for the success of the meeting. In view of the object being served in disbursing these funds as well as the small amount involved, it appears that they do not offer a solution to the problem of participation by developing countries.

208. To sum up, if it is considered necessary to increase participation by developing countries in scientific symposia of the type that the Agency has engaged in over the last nine years, it appears that this can only be done to an appreciable extent by some form of subsidy which will involve considerably increased expenditure on each symposium. Change of topic or of location has some, but not a marked, effect; it may nevertheless be desirable for the Agency to invite a limited number of selected participants from developing countries to attend its symposia at its own expense.

209. The other course adopted by the Agency has been that followed in the case of the regional study group meetings mentioned above. Even in that case, and despite the element of subsidy, there have occasionally been problems in securing adequate participation. For groups of countries having only a few new scientists, saturation point can be fairly easily reached in any given topic.

Scientific publications, documentation and library

(a) Publications and documentation

210. The Agency's publications programme is chiefly the product of other activities, such as proceedings of symposia, panels, and regulations. The developing countries' interest in these publications will thus reflect the interest in the subject-matter of the symposium or panel.

211. The publications policy is that each Member State may request a standard distribution of up to ten free copies of all publications and may also designate a depositary library to receive an additional free copy, and a limited number of governmental institutions to receive further free copies, the maximum in practice being four. Thus a Member State may receive an overall maximum of 15 free copies.

212. The extent to which Member States exercise these rights is shown in Table 20 [27]. It will be seen that most of the "advanced" Member States draw ten free copies; many developing Member States do likewise. Thus, of a total of 843 free copies of each

---

[27] Reproduced at the end of this section.

publication distributed in 1966, there was a standard distribution of 538 per publication, or 64% to developing countries.

213. Sales of the Agency's publications amounted in 1966 to an average of 850 copies per publication, in addition to free distribution. The total number of publications sold was 42 000, of which about 3000 were sold in developing countries, through the Agency's sales agents and through direct sales from Headquarters.

214. It appears that the demand by developing countries is largely met by the free distribution. Since the publications programme is now mainly financed from sales revenue, the sales in "advanced" countries are helping considerably to pay for free distribution in the developing countries.

215. Besides the publications resulting from other programmes, the Agency has published 42 issues of its Atomic Energy Review, in which five articles have been prepared by scientists from developing countries. The ratio of the demand by developing countries to that by "advanced" countries for the review is approximately one to three; i.e. 402 sales copies and 840 free copies - 1242 copies or 72.5% - go to advanced countries, and 469 free copies - 27.5% - to developing countries.

(b) Library

216. The demand by developing countries for films rose from 39.9% in 1964 to 49.2% in 1966 of all films lent to Member States. Publications lent varied from 31.4% in 1964 to 46.9% in 1965, declining again to 41.2% in 1966. Duplicates given also declined from 33.8% in 1964 to 18.8% in 1966.

217. It is difficult to derive a trend from any of these groups of statistics, since in each case large borrowings by or shipments to one or two countries in a given year considerably distort the figures and increase the percentage of all shipments in the year to developing countries.

TABLE 20

Free distribution of Agency publications in 1966

Country	Requested standard distribution	Depositary libraries	Governmental institutions
Afghanistan*	5	1	
Albania*	3	1	
Algeria*	9		
Argentina*	10	3	
Australia	10	1	
Austria	10	1	
Belgium	9	1	3
Bolivia*	10	1	
Brazil*	10	2	
Bulgaria*	10	1	
Burma*	5	1	
Byelorussian Soviet Socialist Republic	10	1	
Cambodia*	4	1	
Cameroon*	2		
Canada	10	1	
Ceylon*	6	1	
Chile*	10	1	
China*	10	1	
Colombia*	10	1	
Congo*	5		
Costa Rica*	5		
Cuba*	10	1	
Cyprus*	3		
Czechoslovak Socialist Republic	10	1	
Denmark	7	1	
Dominican Republic*	4	1	
Ecuador*	4	1	
El Salvador*	5	1	
Ethiopia*	10	1	
Finland	5	1	
France	10	1	4
Gabon*	2		
Germany, Federal Republic of	10	1	
Ghana*	9	1	
Greece*	10	1	
Guatemala*	10	1	
Haiti*	9	1	
Holy See	5		
Honduras*	6	1	
Hungary*	10	1	
	302	36	7

Country	Requested standard distribution	Depositary libraries	Governmental institutions
Iceland	5	1	
India*	10	1	
Indonesia*	10	1	
Iran*	10	1	
Iraq*	10	1	
Israel*	10	1	
Italy	10	1	1
Ivory Coast*	3		
Jamaica*	1		
Japan	10	1	
Jordan*	3		
Kenya*	3		
Korea*, Republic of	10	1	
Kuwait*	3		
Lebanon*	8		
Liberia*	3		
Libya*	10	1	
Luxembourg	4	1	
Madagascar*	4	1	
Mali*	2		
Mexico*	10	1	
Monaco	5	1	
Morocco*	7	1	
Netherlands	10		1
New Zealand	10	1	
Nicaragua*	4	1	
Nigeria*	10	1	
Norway	10	1	
Pakistan*	9	1	
Panama*	3		
Paraguay*	4	1	
Peru*	4	2	
Philippines*	10	1	
Poland*	10	1	
Portugal	10	1	
Romania*	10	1	
Saudi Arabia*	10	1	
Senegal*	4		
South Africa	10	1	
Spain	10	1	
Sudan*	10	1	
Sweden	10	1	
Switzerland	10	1	3
Syrian Arab Republic*	10		
Thailand*	5	1	
	334	34	5

Country	Requested standard distribution	Depositary libraries	Governmental institutions
Tunisia*	9	1	
Turkey*	10	1	
Ukrainian Soviet Socialist Republic	10	2	
Union of Soviet Socialist Republics	10	1	
United Arab Republic*	10	1	
United Kingdom of Great Britain and Northern Ireland	10	1	4
United States of America	10	1	1
Uruguay*	10		
Venezuela*	10	1	
Viet-Nam*	10	1	
Yugoslavia*	10	1	
TOTAL	745	81	17

G. SPECIAL ANALYSIS OF RESEARCH CONTRACTS

218. The primary function of research contracts is the conduct of research in support of the Agency's scientific work. In general a very large proportion of the research subjects selected are, however, of specific interest to the developing countries and, where consistent with programme requirements, preference in awarding contracts is given to competent institutes located in developing countries.

219. In order to derive the maximum benefit from the limited funds available and to support the maximum number of well-conceived projects on as wide a geographical basis as possible, every effort is made both to keep individual awards to a minimum and to concentrate on a limited number of well-defined subjects. Broadly speaking, the work falls into two major categories: research associated with the Agency's statutory functions (such as the protection of workers and the public against the harmful effects of ionizing radiation); and research concerning specific problems - particularly those of the developing countries - with regard to which some form of nuclear technology can be applied (such as the use of radioisotope tracers in medicine, agriculture, and hydrology). Certain projects, of course, fall into both categories. A reasonable balance has now been achieved between these two categories, and scientists in the developing countries are playing a major role in research contract work. As will be seen from Table 21 and the accompanying Chart 21.A, approximately two thirds of the total funds are devoted to projects carried out by institutes in developing countries.

220. The major reason for this high degree of participation in the programme, aside from the increasing competence of scientists in the developing countries, lies in the selection of research subjects which are directly related to specific problems of the developing countries and in respect of which scientists in these countries can make an effective contribution. Chart 22.B indicates, to some extent, the shift in emphasis since the beginning towards those activities in which research may most effectively be undertaken in developing countries. Broadly speaking, a shift from projects of a more fundamental nature to applied research has been effected throughout the programme, and a high proportion of the total funds available is now used for the support of research on radioisotope applications.

221. A detailed analysis of the distribution of research contract funds in 1966, given in Table 22 and its accompanying Chart 22.A, indicates that not only were 64% of all funds awarded to institutes located in developing countries, but that an additional 12% were awarded to institutes in "advanced" countries for work on problems of direct interest to the developing countries. Thus some three quarters of the research contract budget was used last year for the support of research of fundamental benefit to the developing countries.

TABLE 21

Distribution of Agency research contract funds between developing and "advanced" countries [a]

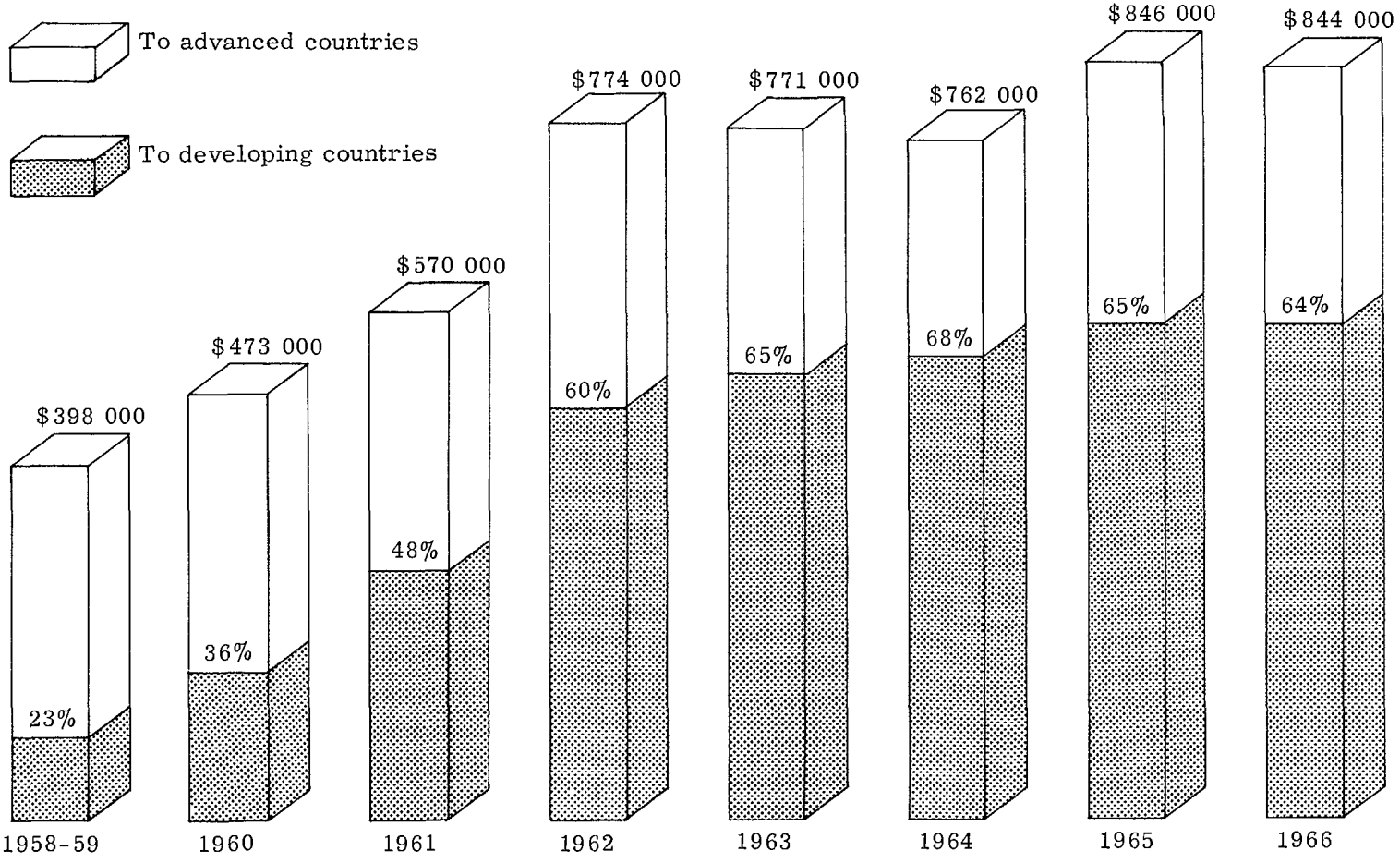
Year	Awarded to institutes in developing countries	Awarded to institutes in "advanced" countries	Total amount awarded
	%	%	$
1958-59	23	77	397 911
1960	36	64	472 765
1961	48	52	570 094
1962	60	40	773 972
1963	65	35	770 757
1964	68	32	762 391
1965	65	35	846 417
1966	64	36	844 265

[a] Regular and Operational Budgets combined.

CHART 21.A

Distribution of research contract funds between developing and "advanced" countries[a]

1958-1965



[a] Regular and Operational Budgets combined.

TABLE 22

Distribution by subject of Agency research contract funds in relation to developing countries (1966) [a]

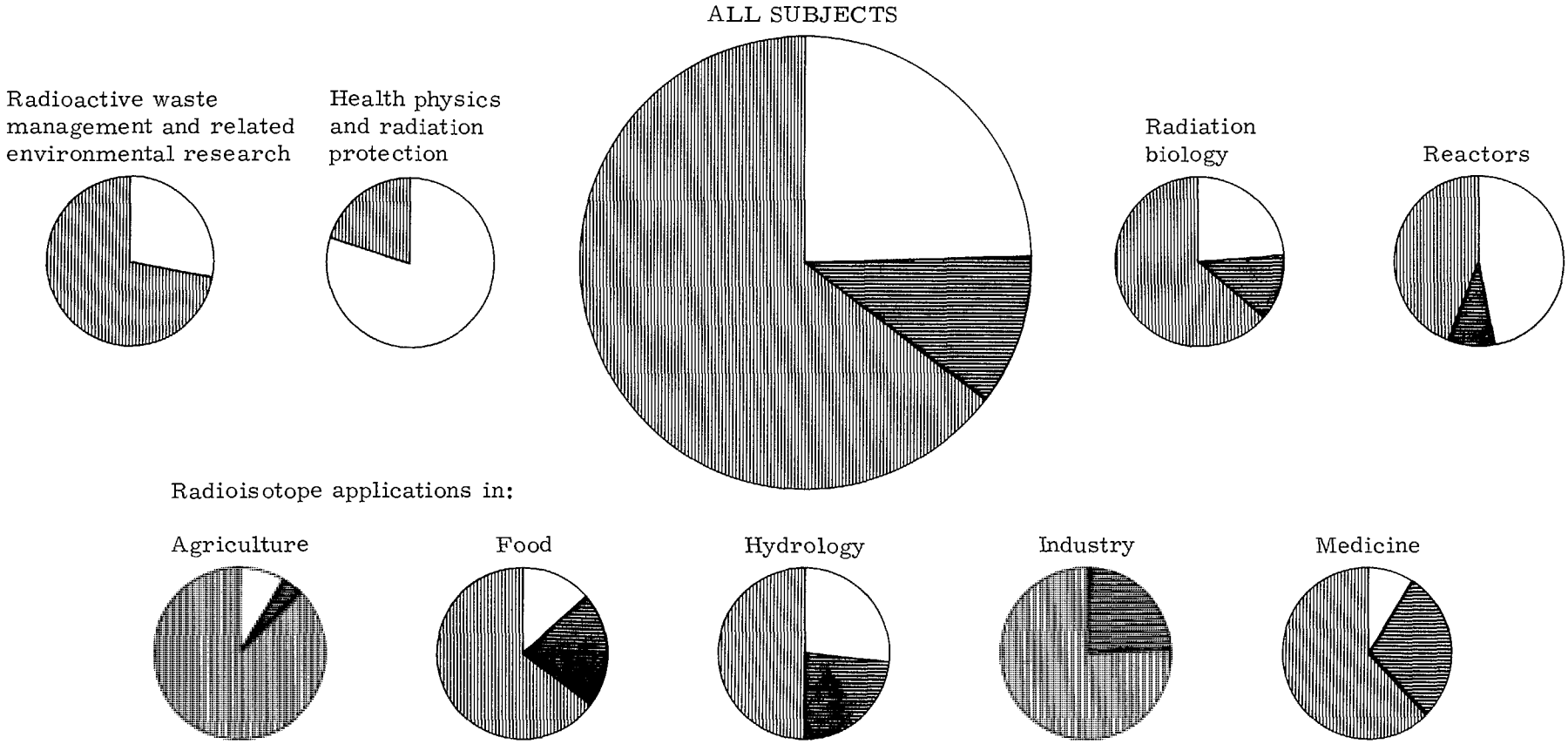
Subject	Amount awarded to institutes in developing countries [b]	Amount awarded to institutes in "advanced" countries for work of specific interest to developing countries [b]	Amount awarded to institutes in "advanced" countries for work of general interest to all Member States [b]	Total amount awarded
	%	%	%	$
Radioactive waste management and related environmental research	69	-	31	122 252
Health physics and radiation protection	19	-	81	58 035
Radiation biology	66	13	21	76 340
Reactors	43	11	46	129 380
Radioisotope applications in:				
Agriculture	88	4	8	173 910
Food	65	23	12	33 900
Hydrology	51	22	27	48 760
Industry	77	23	-	20 493
Medicine	67	27	6	181 195
All subjects (total)	64	12	24	844 265

[a] Regular and Operational Budgets combined.

[b] These three categories are of course not mutually exclusive. This presentation has been chosen in order to identify the efforts made to relate the programme to the developing countries.

CHART 22. A

Distribution by subject of Agency research contract funds in relation to developing countries [a] (1966)

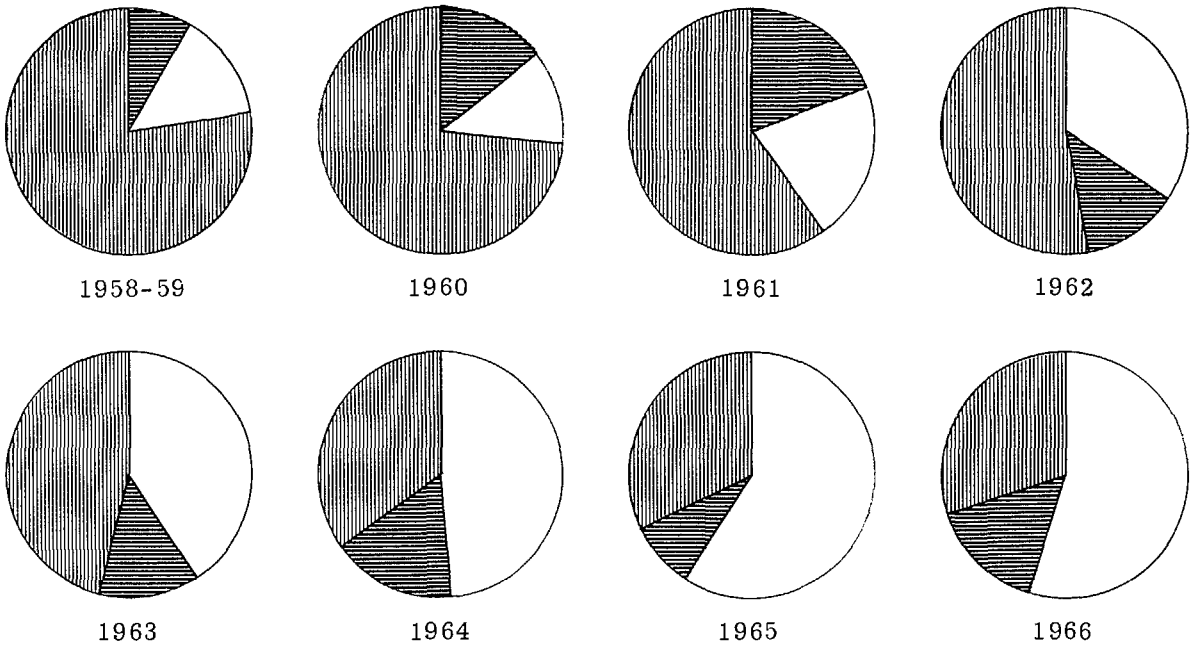


[a] Regular and Operational Budgets combined.

CHART 22. B

Distribution by subject-matter of Agency research contract funds

(Regular and Operational Budgets combined)



[a] For 1965 and 1966, reactor research only.

[b] Including food irradiation.

APPENDIX

List of States [a] for which a programme under the technical assistance component of UNDP has been approved by the UNDP Governing Council for the period 1967-68 [b]

Afghanistan
Albania
Algeria
Argentina
Barbados
Bolivia
Botswana
Brazil
British Honduras
Bulgaria
Burma
Burundi
Cambodia
Cameroon
Central African Republic
Ceylon
Chad
Chile
China
Colombia
Comoro Islands
Congo (Brazzaville)
Congo (Democratic Republic of)
Costa Rica
Cuba
Cyprus
Dahomey
Dominican Republic
"East African Common Services Organization"
Ecuador
El Salvador
Ethiopia
Fiji
French Somaliland
Gabon
Gambia
Ghana
Gilbert and Ellice Islands
Greece
Guatemala
Guinea
Guyana
Haiti
Honduras
Hungary
India
Iran
Iraq
Israel
Ivory Coast
Jamaica
Jordan
Kenya
Korea, Republic of
Kuwait
Laos
Lebanon
Lesotho
Liberia
Libya
Madagascar
Malawi
Malaysia
Mali
Malta
Mauritania
Mauritius
Mexico

Mongolia

Morocco

Nepal

Netherlands Antilles

New Hebrides

Nicaragua

Niger

Nigeria

Pakistan

Panama

Paraguay

Peru

Philippines

Poland

Romania

Rwanda

Saudi Arabia

Senegal

Seychelles

Sierra Leone

Singapore

Solomon Islands

Somalia

Sudan

Surinam

Swaziland

Syrian Arab Republic

Thailand

Togo

Tonga

Trinidad and Tobago

Tunisia

Turkey

Uganda

United Arab Republic

United Republic of Tanzania

- Tanganyika
- Zanzibar

Upper Volta

Uruguay

Venezuela

Viet-Nam, Republic of

Western Samoa

Yemen

Yugoslavia

Zambia

---

a/ Member States of the Agency are underlined.

b/ Indonesia, although not included in this list, is expected to receive UNDP assistance and is regarded as a developing country for the purpose of this paper.

ANNEX C

AN INTEGRATION OF THE VIEWS AND RECOMMENDATIONS OF MEMBER STATES (Annex A), AND OF THE PRELIMINARY ANALYSIS OF THE EXTENT TO WHICH THE AGENCY'S ACTIVITIES BENEFIT DEVELOPING COUNTRIES (Annex B)

I. INTRODUCTION

1. By 15 March 1967, 30 Member States had responded to the Director General's invitation to communicate their views and recommendations in relation to the review of the Agency's activities to find ways and means of increasing its assistance to Member States, which the General Conference has requested the Board to undertake [1]. The replies received showed that many Member States held identical or similar views on some of the subjects dealt with in the preliminary analysis of the extent to which the Agency's activities benefit developing countries, which is reproduced in Annex B. For ease of reference, the present paper follows as far as possible the order in which subjects are analysed in Part II of that Annex. In summarizing the views relating to a particular subject, the number of replies in which each view is expressed is given in parentheses [2]; reference is made to the paragraphs in Annex B which indicate the extent to which the view expressed is reflected in the Agency's programmes or provide information which has a bearing on the recommendations made.

2. As several replies were received from Member States after the material now reproduced in Annex B was originally compiled, it has been found desirable in most cases to supplement the information given in that Annex on each subject; it must be stressed that the additional information or comments are supplementary in character and that, for a full understanding of the Agency's work, policies and practices that have a bearing on the replies received, it is essential to refer back to Annex B.

3. Views and recommendations relating to the detailed administration of various programmes will be taken into account by the Secretariat in carrying out these programmes.

4. Proposals for new projects or programmes that are planned by the Secretariat as a consequence of the views expressed by Member States, or in the course of the review as a whole, will be submitted to the Board as part of the Director General's proposals for the next biennial programme or be reflected in the next long-term programme.

General balance between programmes

5. The current balance between the various programmes of the Agency reflects, broadly speaking, the guide-lines laid down in its Long-Term Programme [3] and the effects of major developments in its work relating to nuclear power, the dissemination of information and safeguards that have occurred since that programme was approved by the General Conference in 1963. Three of the replies received from Member States explicitly recommend that greater emphasis should be laid on the practical applications of atomic energy, and this view is implicit in certain other replies.

---

[1] By Resolution GC(X)/RES/217. The Director General's invitation was made pursuant to para. 4.

[2] All the views and recommendations which had been received by the time this document was sent to press are reproduced in Annex A; however those received after 15 March - those of Canada, India, Italy, Lebanon, Madagascar, (second letter) and Romania - are not covered by the present analysis.

[3] INFCIRC/50.

6. On the other hand, three replies, while recognizing the importance of "developing country oriented" activities, express satisfaction with the Long-Term Programme, express the hope that, in carrying out the review, the importance of not disrupting many other important activities will be recognized or point out that the latter activities can help to maintain the high scientific level of the Agency's programmes as a whole and that this will render the assistance provided to developing countries more effective.

7. Two replies explicitly pointed out that the programme must take into account the common interests of all Member States. Two replies stressed that the programme must be based on a realistic assessment of financial resources and that any shift of emphasis that occurs should be brought about through a redistribution of existing resources. The belief that the programme should be of universal interest and that account should be taken of the availability of funds was also reflected in many other replies.

Procedures for undertaking the review

8. Several replies drew attention to the need for giving developing countries the fullest opportunities to express their views and pointed out that particular importance should be attached to proposals made by the developing countries themselves.

II. TECHNICAL ASSISTANCE AND OTHER DIRECT AID

(Training facilities, including fellowships, expert services and equipment)

Resources

(a) Views and recommendations by Member States

9. Steps should be taken to obtain additional voluntary contributions to the Operational Budget. (6) (Annex B, para. 7(a))

10. If necessary, the relevant financial rules or Statute should be amended to ensure that such contributions are proportionate to a State's contributions to the Regular Budget. (1)

11. It would not be desirable to take any decision that would require an increase in the voluntary contribution of funds. (2)

12. More resources should be sought by encouraging contributions in kind and by obtaining help from other sources, such as UNDP and the specialized agencies of the United Nations. (3) (Annex B, para. 23)

13. It is for the developing countries to decide the extent to which they wish UNDP resources to be used for atomic energy rather than other programmes. (3) (Annex B, para. 23)

14. Expenditure for other purposes, particularly personnel, should be reduced and the savings should be used to finance more technical assistance. (1) (Annex B, para. 7(a))

(b) Supplementary information and comments by the Secretariat

15. See Annex B, paras. 7(a), 11, 12, 15, 21-27, 30 and 37-41, and Tables 2-4.

16. A number of appeals have been made by the General Conference, the Board and the Director General for additional resources in cash or in kind. Generally speaking, these have proved more successful when they were made for a specific purpose, such as the provision of Type II fellowships and equipment for the Laboratory. The fact that resources to the value of nearly $30 000 000 have been placed at the Agency's disposal in 1959-66 for the provision

of direct aid of various kinds to developing countries shows that the appeals made have not been without effect. Nevertheless, the contributions made each year to the Agency's General Fund have consistently fallen short of the target figure set by the General Conference each year.

17. The view that the priority to be observed in using UNDP resources is entirely a question for the developing countries themselves reflects a basic principle of the UNDP programme.

18. As pointed out in paragraph 7(a) of Annex B, under the terms of the Statute the technical assistance provided by the Agency depends entirely upon voluntary contributions or upon sources of finance outside the Agency's budget. It is not possible under the Statute to expand the technical assistance programme by making use of any savings that would result from a curtailment of other programmes. With regard to administrative and personnel costs, a sum of $2 797 750 was spent on general direction and administrative services and on the costs of the General Conference and the Board of Governors in 1966. The total resources available to the Agency for that year were approximately $12 433 000 (see Annex B, Tables 2 and 3). Thus approximately $9 635 250 were spent on scientific and technical programmes or made available for direct aid to individual developing countries. These programmes require, of course, the employment of scientific and technical personnel.

Programme planning and evaluation

(a) Views and recommendations by Member States

19. The Agency should ascertain the degree to which developing countries have benefited from its programmes and obtain their views on possible reorientation. (2) (Annex B, paras. 47-50)

20. Developing countries should be helped to prepare their projects and the Agency should subsequently send experts to help them carry them out. (2) (Annex B, paras. 9, and 47-50)

21. How the needs of developing countries can best be met is a perennial question which must, therefore, be kept before the various organs of the Agency. (1)

22. The Agency should stimulate the interest of Ministries of Technology, Finance and Planning, etc., as well as of Atomic Energy Authorities in its programmes. (1)

(b) Supplementary information and comments by the Secretariat

23. As pointed out in paragraph 9 of Annex B, a total of nine missions sent out since 1958 has helped 45 developing Member States to plan their programmes. This help has been supplemented by the work of 806 experts, who have also assisted Member States to carry out approved projects.

24. A continuing evaluation is made by the Secretariat, by missions and by individual experts of the benefits that developing countries have derived from the Agency's help. The Board annually reviews a special report on the Agency's technical assistance programme. ECOSOC and UNDP make independent evaluations of the effects of United Nations development programmes in particular countries. None has so far dealt in depth with projects helped by the Agency, which form a small part of the whole.

Programme emphasis

(a) Views and recommendations by Member States

25. More emphasis should be placed on assistance in the applications of atomic energy which would be of direct economic benefit, particularly in the case of power, agriculture, hydrology, desalting, medicine and raw material development. (4) (Annex B, paras. 47 and 53, and Table 5)

(b) Supplementary information and comments by the Secretariat

26. As pointed out in paragraph 53 of Annex B, the trend in technical assistance programmes, which is determined by the requests received from Member States, reflects an increasing emphasis on agriculture and on nuclear engineering and technology. With the spread of nuclear power and in the light of the findings of a committee which recently reviewed the work of the Joint FAO/IAEA Division of Atomic Energy in Food and Agriculture and drew particular attention to many promising lines of research and application, this trend may be expected to become more marked in future.

Distribution of technical assistance by component elements (experts, fellowships and equipment)

(a) Views and recommendations by Member States

27. Equipment should be made available independently of the services of an internationally recruited expert. (6) (Annex B, paras. 56-62)

28. A larger proportion of technical assistance funds should be spent on equipment. (7)

29. The decreasing proportion of funds spent on experts between 1965 and 1966 is unsatisfactory. (1)

30. More funds should be provided for fellowships and for the exchange programme. (1)

31. Certain difficulties have been experienced in finding suitable applicants for Type II fellowships offered. (1)

32. More emphasis should be placed on training scientists from developing countries in the advanced countries than on sending experts to the developing countries. (1)

33. Training in theoretical subjects should be left largely to the specialized agencies of the United Nations. (1)

(b) Supplementary information and comments by the Secretariat

34. It should be emphasized that all technical assistance provided is determined on the basis of the requests received from Governments and that the balance between component elements as well as between disciplines and techniques (programme emphasis) reflects the requests of Governments themselves.

35. It will be noted from Annex B, Chart 7.A, that the equipment component of technical assistance provided by the Agency (including Special Fund) has grown slightly over the years. Some Member States have voluntarily provided equipment within the context of approved technical assistance projects. This help might be further encouraged by publicizing equipment needs and arranging for them to be met multilaterally or bilaterally.

36. Any basic change in the principle that the provision of equipment and supplies must form an integral part of a technical assistance project would require revision of the Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the Agency approved by the General Conference in 1960 [4], which are in conformity with the guiding principles and criteria applied under the UNDP/TA Component. A certain degree of flexibility is, however, allowed in the case of the Agency. Equipment has, for instance, been provided in appropriate cases to help a fellow returning to his home country. Supplementary equipment and supplies have also in appropriate cases been provided on the recommendation of an international expert after he has completed his assignment.

---

[4] GC(IV)/RES/65, Annex.

37. With regard to the view expressed in paragraph 29, the trend over the years has, in fact, been for the proportion of funds spent on experts to increase, as shown in Annex B, Chart 7.A.

Expert services

(a) Views and recommendations by Member States

38. Experts should be sent to countries for longer periods - two years at least - to train local counterparts. (1)

39. The Agency should send an increasing number of very highly qualified short-term experts. (1)

40. Experts should be sent to accompany groups of trainees who are returning from training abroad. (1)

41. Atomic energy authorities in neighbouring countries should be informed of the presence of an expert within the area. (1)

(b) Supplementary information and comments by the Secretariat

42. The need for both longer-term experts and for the assignment for shorter periods of very highly qualified experts is recognized. The problems encountered by all organizations in the United Nations family are a shortage of resources and an increasing difficulty in attracting experts, because of the inducements offered by industry and Governments, and in obtaining their long-term secondment from employers. No limitation is laid down as a matter of policy with regard to the period for which an expert may be assigned. Experience has shown that it is impossible to establish firm rules regarding the duration of assignments, and since the technical assistance programme started less than 10% of the experts have had their assignments extended at the request of Governments.

Fellowships and training

(a) Views and recommendations by Member States

43. A trained local scientist is more valuable than a foreign expert. (1)

44. The decreasing demand for fellowships is mainly attributable to the protracted character of the procedures involved. (1) (Annex B, para. 61)

45. The duration of fellowships should be at least one year. (1)

46. Fellowships should be awarded with a view to training up to doctorate level. (1)

47. The Agency must ensure that a trainee's knowledge of the language of the country to which he is sent is sufficient to enable him to carry out his studies. (1)

48. The Agency should give more weight to the views of the nominating country in selecting the subject of training. (1)

49. Training courses should be held at the regional level. (1)

50. The Agency should train technicians (as well as graduates) by holding local or regional training courses or sending experts, rather than through fellowships for study abroad. (1)

(b) Supplementary information and comments by the Secretariat

51. In paragraph 61 of Annex B it is pointed out that some of the reasons for the decline in the proportion of fellowships in the technical assistance programme are that the large initial need for training personnel had been satisfied by the early programmes, that better training facilities are now available at home, and that in-service training of the counterpart to an international expert meets part of the need. The following additional points should be made. Firstly, the size of the fellowship programme in terms of the number of awards made, as well as cost, has been relatively stable for the past six years. Secondly, the number of applications has been affected by the Secretariat's efforts to induce requesting Governments to make a more careful preselection of candidates with a view to reducing the work involved in processing a large number of unsuitable applications. A further reason for the fall in the number of applications is purely administrative in character. In earlier years, applications which had not been accepted in any given year were automatically carried over to the next. This procedure, which statistically inflated the number of applications, was abandoned some years ago.

52. By far the longest delays that occur after a fellowship application has been submitted are those caused by difficulties in obtaining placement in a host country or in obtaining the approval of the nominating Government when placement has been secured. Another cause of delay is that the last date for submissions of applications for all technical assistance requests is 30 June of a given year, while funds only become available to implement the programme at the beginning of the succeeding year. It is also often necessary for a fellow to wait for the start of an academic year or for a particular training course.

53. With reference to paragraphs 45 and 46 above, it was laid down in the Report of the Preparatory Commission of the Agency that since the Agency's resources are limited and since its activities must be co-ordinated with those of other international organizations, fellowships should be awarded only for specialized training in nuclear science and its applications. [5] Since specialized training is involved, the normal maximum duration of a fellowship is one year and awards are not usually made for the purpose of obtaining a degree. However, the Agency does help in those cases where the acquisition of a degree can readily be combined with the proposed training. The original duration is extended by periods of up to one year in special cases, and occasionally the extension enables the student to obtain a doctorate. Certain Type II fellowships also permit training for a degree.

54. With regard to paragraph 49 above, 12 of the 21 training courses proposed in the programme for 1964-68 will be on a regional basis. With regard to paragraph 50 above, it should be noted that fellowships are awarded to technicians when there are grounds for believing that they will make a worth-while contribution to their home country's programme. Furthermore, the Agency conducts training courses for technicians and sends experts to individual countries to train technicians; it also keeps in close touch with UNESCO and ILO with a view to increasing the facilities available for training technicians.

55. Finally, with regard to the general question raised in paragraph 43 above, the knowledge acquired by a trained local scientist is unquestionably more valuable to the country concerned than the services of a foreign expert. The specialized knowledge usually required of the Agency's experts is acquired, however, only after many years of scientific specialization and cannot be acquired by a fellow during the course of his relatively short fellowship. In the Secretariat's view, developing countries usually need all forms of technical assistance - fellowships for study abroad, training at home, and the services of experts. What is most important is that the programme should be integrated; this permits the Agency to train a fellow abroad and to have him back in his home country when an expert arrives so that he may be able to give full support to the expert and derive full benefit from the latter's visit.

---

[5] GC.1/1, para. 70.

Equipment

(a) Views and recommendations by Member States

56. Developing countries should be helped to choose the equipment they need and the money allotted for its purchase should be kept available for a longer time. (1)

57. Equipment should be supplied more quickly, and steps should be taken to ensure that the equipment provided meets as closely as possible the need for which it is requested. (1)

58. The Agency might help to procure the equipment needed through ordinary commercial channels, financed by the supplying Government through long-term loans. (1)

59. The Agency must ensure that equipment needed by an expert arrives in time to allow him to take up his assignment. (1)

(b) Supplementary information and comments by the Secretariat

60. The Secretariat consults at all stages with Governments about their needs for equipment, and funds are kept available for approved equipment until it is delivered (Regular Programme) or until the end of the two-year period in question (UNDP/TA). Detailed lists are frequently drawn up by Agency field experts. The chief difficulties experienced in ensuring that equipment is speedily supplied are delays on the part of the requesting Governments in submitting detailed specifications for the equipment required, non-adherence to production schedules by manufacturers, delays in customs clearance, shipping timetables and so forth.

Regional projects, particularly centres

(a) Views and recommendations by Member States

61. More international or regional centres should be established in the developing countries. The subjects which should be given special emphasis by such centres are: pest control, prospecting for nuclear materials and water resources, tropical medicine, agriculture, and radioisotope applications in general. One reply stressed the need, particularly in Africa, for regional activities with a view to mobilizing resources, avoiding duplication and rationalizing the work of countries in the region. A specific proposal is made to set up in South-East Asia regional centres for tropical medicine and agriculture respectively. (6) (Annex B, paras. 28-29)

62. The use of existing facilities in developing countries is preferable to the establishment of new centres. Any regional centres supported by the Agency should be open to all Member States in the region. (1)

63. Research should be encouraged in regional centres by the award of research contracts. (1)

64. The Agency should provide advice and obtain experts from advanced countries to carry out regional projects approved by the Board. (1)

(b) Supplementary information and comments by the Secretariat

65. The question of regional centres was last discussed in February 1966 by the Board, which recognized that a regional pooling of research and training would be a reasonable procedure, although difficult to apply in practice. The Director General's proposals relating to the examination of requests for assistance to such centres appear to have been generally accepted by most Governors. The chief criteria to be met in the case of a regional project are as follows:

(a) It must have full support from other countries in the region, from the point of view of their willingness to contribute to it and make use of it;

(b) The host country and other countries must pledge funds and equipment for the continued operation of a centre; and

(c) It must be established that the centre will be viable after the Agency's financial help has achieved its initiatory function and come to an end.

66. It should be borne in mind that it is open to any State or group of States to propose to UNDP that it should help to finance the establishment of regional projects, including centres dealing with atomic energy; in fact, one of the projects the Agency is executing for the Special Fund is regional in character. The total resources from both UNDP and the Agency likely to be available for regional projects are very limited; it is therefore particularly important to note the relatively high cost of regional centres. For instance, the 1967 budget of the Middle Eastern Regional Radioisotope Centre for the Arab Countries in Cairo is $167 000.

67. Regional centres are, of course, eligible for and receive research contracts from the Agency.

Other direct aid

(a) Views and recommendations by Member States

68. The Agency should encourage the grant of bilateral aid - financial or in kind - to specific Agency projects, taking into account the resources and experience of the donor country. (1)

(b) Supplementary information and comments by the Secretariat

69. The amount of bilateral aid available for the peaceful uses of atomic energy has diminished considerably in recent years. The Secretariat welcomes any proposals that would supplement aid given under its auspices and has on occasion endeavoured to put the recipient country in touch with potential donors, but its efforts have not been very fruitful.

III. NUCLEAR POWER (including desalting)

(a) Views and recommendations by Member States

70. The Agency should give greater emphasis to its work in nuclear power (5), and desalting (3), and exploitation of nuclear raw materials (2).

71. The Agency should encourage the developing countries to make studies of their long-term energy requirements, including the need for nuclear power. (2) (Annex B, paras. 71-73)

72. The Agency should give active help to Members in seeking capital from international banks on easier terms. (1)

73. The Agency should help in organizing continental centres which would assist in taking protective measures in the case of large-scale nuclear accidents. (1)

74. The Agency should establish one or more power reactor centres to train specialists in building and running reactors, fuel fabrication facilities etc.

75. The Agency should promote regional or continental centres for applying nuclear methods of prospecting for raw materials and water resources; one centre should be established in the Middle East. (1)

76. A desalting reactor institute might be established in an advanced country to provide services, especially training facilities, to all interested Member States. (1)

(b) Supplementary information and comments by the Secretariat

77. The Secretariat would welcome an increased use of the Agency's services by Member States in assessing their power needs and the prospects for nuclear power.

78. The importance that many developing countries attach to the Agency's good offices in obtaining capital from international financing institutions in accordance with Article XI. B of the Statute is appreciated and will be kept in mind. Individual reports on power prospects are brought to the attention of such institutions. The Secretariat is in close touch with IBRD in relation to a study it is making of the prospects for nuclear power. The Secretariat has taken steps over the years to ensure that the methods it uses for economic analysis are compatible with those adopted by financing institutions. The latter are usually required by their own rules to make an independent assessment before making loans; it is nevertheless important that the financial community should have confidence in the objectivity and reliability of the Agency's preliminary and pre-investment studies.

79. It is also clear that the Agency can help indirectly to promote the flow of capital for construction of nuclear power plants by playing an increasingly active role with regard to those aspects of nuclear power which are not of direct concern to financing institutions. Amongst these are the safety of operation and of site selection, the facilitation of the movement of equipment and fuel, particularly irradiated fuel, and the associated questions of liability and insurance, the basic legislation and safety regulations that must be introduced by countries embarking on a nuclear power programme, and international safeguards. Many of the initial steps necessary to create propitious conditions for the use of nuclear power must be taken by Member States; this could be done, in fact, through the adoption of the Basic Safety Standards for Radiation Protection [6], Regulations for the Safe Transport of Radioactive Materials [7], and the Vienna Convention on Civil Liability, and by direct action to facilitate the use of ports, international waterways and canals by vessels carrying nuclear materials.

80. With regard to the proposal to establish one or more power reactor training centres, the Preparatory Commission of the Agency recommended in 1957 a special programme for constructing a limited number of reactors in various regions, particularly for training purposes [8]. Proposals have also been considered from time to time for setting up centres of the type referred to in a south-east Asian and a south-east European country. Doubt about the economic viability of small nuclear power plants and the need for a small plant as a stepping-stone to a larger and economically more promising one, the lack of regional support and the inadequacy of financial resources has militated against the implementation of any of these projects.

81. If the improved economic prospects for nuclear power are to result in the implementation of a project of this kind, it will presumably have to be preceded by a detailed pre-investment study of the type the Agency has carried out in the Philippines on behalf of UNDP. In this case the interested Government would have to make the initial approach to UNDP.

IV. RADIOISOTOPES AND RADIATION SOURCES

(a) Views and recommendations by Member States

82. The Agency's programme should be channelled especially towards agriculture, which is the main basis of the economy of developing countries. (1)

---

[6] STI/PUB/26.

[7] STI/PUB/97.

[8] See document GC.1/1, paras. 45-51.

83. More help should be given in agriculture and medicine (2), and regional projects should be launched in these fields. (2)

84. The Agency should help to organize the production and distribution of the most frequently used radioisotopes and labelled compounds and promote their exchange between consuming States using them. (1)

(b) Supplementary information and comments by the Secretariat

85. The Agency's work relating to isotopes and radiation sources is described in paragraphs 100-150 of Annex B. The view that more importance should be attached to helping developing countries to apply radiation and isotopes in agriculture and the life sciences is also emphasized in some Governments' recommendations to the effect that the Agency should concentrate on the practical application of nuclear science, as well as in some of the proposals made for the establishment of regional centres. Reference has also been made in paragraph 26 above to the great potentialities of using atomic energy in food and agriculture, to which particular attention was drawn in a recent review of the work done in this connection by the Agency and FAO.

V. HEALTH, SAFETY AND WASTE MANAGEMENT

(a) Views and recommendations by Member States

86. The Agency should help in organizing continental centres which could assist in taking protective measures in the case of large-scale nuclear accidents. (1) (See paragraph 73 above.)

87. The Agency should help developing countries to draft regulations governing the use of nuclear energy and the transport of nuclear fuel and sources of ionizing radiation. (1)

88. The expansion of the activities in the International Laboratory of Marine Radioactivity in Monaco will help to bring about an acceptable solution of the problem of atomic waste disposal into the sea. (1)

89. The application of safety standards (as well as the execution of certain other projects) cannot be regarded solely as aid to developing countries. (1) (Annex B, paras. 151-164)

(b) Supplementary information and comments by the Secretariat

90. The Agency has set up a scheme for emergency help and many Member States have indicated the assistance they would be prepared to give in the event of an accident; under this scheme rapid and efficient help could be provided by Member States and the Secretariat. The Agency, with WHO and FAO, also provides guidance on emergency planning. Advisory services on reactor safety, siting, waste management, and on the preparation of regulations governing the use of atomic energy and its safety aspects are made available on request, and the Secretariat would welcome increasing use of these services.

VI. RESEARCH AND SERVICES IN THE PHYSICAL SCIENCES, INCLUDING RESEARCH CONTRACTS

(a) Views and recommendations by Member States

91. The Agency should eschew advanced and theoretical research and confine itself chiefly to research on practical applications (3), especially agriculture and hydrology (2), medicine and veterinary medicine (1) and desalting (1). The Agency's role with regard to advanced research should be to promote the exchange of information on results obtained in national centres (1). (Annex B, paras. 16-19, 34, 165-168 and 218 et seq.)

92. The Agency should award more research contracts to laboratories in developing countries (4) and on subjects of interest to developing countries. (4) Developing countries should be helped to prepare their research programmes (1) and should take part in determining the policy to be followed in awarding research contracts. (1) (Annex B, paras. 19 and 219 et seq.)

93. The Agency's activities in agriculture, medicine, radiobiology, hydrology and nuclear power should be given special, although not exclusive, emphasis in the review. (1)

94. Subjects of research contracts should be chosen with a view to solving problems in applied sciences and technology in which all Members are interested. (1)

95. Research contracts should be jointly carried out by countries rich in research experience and those whose experience is more limited. (1)

96. The Agency should promote the establishment of sister laboratories. (1)

97. Research contracts on medical and agricultural subjects should be jointly financed by the Agency, WHO and FAO. (1)

(b) Supplementary information and comments by the Secretariat

98. It will be seen that many of the communications express views that are relevant to all or several aspects of that part of the Agency's activities which aims at promoting the physical sciences, research support and the work of the laboratories. (Annex B, paras. 165-189 and 218-221)

99. It may be useful to explain the following points:

(1) The Agency does not undertake, nor, with rare exceptions, does it support, research on the frontiers of knowledge. That part of its work which is relevant to research in advanced fields of scientific investigation consists very largely of activities designed to promote the exchange of information about research that has been undertaken by national or regional organizations. Thus the Agency's work on research in the physical sciences consists - except for the special case of the International Centre for Theoretical Physics at Trieste - almost entirely of organizing scientific meetings, promoting the exchange of nuclear data and providing help in connection with research reactors in developing countries.

(2) The research contract programme is devoted mainly and increasingly to supporting applied research (see Annex B, Chart 22.B). Since 1963 about 65% of research contracts has been awarded to institutes in developing countries and a further 12% for research in advanced centres on topics of interest to developing countries. That part of the research contract programme which is not "developing country oriented" includes the support of some studies in health physics and radiation protection (by their nature "universally oriented"), some studies in waste management, radiation biology, and support of a few studies in other fields. It must be borne in mind, however, that developing countries having highly qualified scientists may need some assistance in fundamental research to avoid the risk of the 'brain drain'.

100. With regard to the possibility of sharing research contract costs, it should be noted that FAO does not at present have a research programme, while WHO's programme in this field is limited.

VII. INFORMATION AND TECHNICAL SERVICES (including symposia, conferences and study groups)

(a) Views and recommendations by Member States

101. A larger proportion of symposia should be devoted to subjects relating to practical applications of direct interest to developing countries, for example the technology and economics of nuclear power, desalting, and nuclear materials exploitation. (3) (Annex B, paras. 13-15, 191 and 202-203)

102. In order to increase participation by developing countries, more symposia should be held in such countries, particularly those interested in the subject of study. (3) (Annex B, paras. 195-201 and 204-209)

103. Summary reports of scientific meetings, including panels, should be produced as quickly as possible so as to make them available without delay to the persons who need them. (1)

104. The Agency should help to meet the travel and related costs of participants from developing countries in the symposia it sponsors. (2) (Annex B, paras. 207-208)

105. The Agency's publications are of the greatest usefulness to all and constitute a most valuable activity. However, they should be of a more general character, while publications which are of specialized interest, mostly in advanced countries, should be handled on a self-supporting basis. (1)

106. The exchange of scientific and technical information (and certain other activities) cannot be regarded solely as assistance to developing countries. The Agency must obtain the most up-to-date information on the development of nuclear science and technology in the advanced as well as in developing countries. (1) (Annex B, para. 34)

(b) Supplementary information and comments by the Secretariat

107. In considering the question of participation by developing countries in the Agency's scientific meetings, attention must be paid to study group meetings and to certain panels, as well as to the much larger conferences and symposia that are normally subsumed under this heading.

108. Generally speaking, symposia on topics of interest to technically advanced countries, such as plasma physics, magnetohydrodynamics and the use of plutonium as a reactor fuel, are those that draw the largest attendance. On the other hand, symposia on subjects that are, a priori, of special interest to developing countries, for example on certain agricultural applications of atomic energy, have on occasion attracted a disappointingly small number of participants, in one recent case leading to a cancellation.

109. A possible inference is that symposia, which are open to participants from all Member States - which pay the cost of attendance - and are designed to provide a forum for the exchange of the latest results of research, may be more appropriate for topics of universal interest or of interest to the advanced countries. To meet the needs of developing countries, on the other hand, it may be necessary to increase the number of study group type meetings, i.e. meetings with limited or selected participation, in respect of which the Agency pays at least part of the cost of attendance and whose principal object is the transfer of knowledge from the advanced to the developing countries.

110. About 60% of the content of the scientific publications of the Agency relates to its programme of symposia and other scientific meetings. The remaining subject-matter consists of specialized reviews or monographs (10%), publications in the Safety Series (8%), directories (4%), publications compiled at Headquarters and other miscellaneous documentation (18%).

A change in the subjects of scientific meetings would therefore be a prerequisite for any major change in the character of the publications.

111. At present the rules for the distribution of publications dealing with specialized topics of interest to advanced countries and those of a more general character are the same. Each Member State is entitled to a maximum of ten free copies and may request that one further copy be sent to a designated depositary library, and the majority of Member States exercise this right. Other copies are sold at a price which covers the cost of production.

VIII. THE GENERAL DIRECTION AND ADMINISTRATION OF THE AGENCY

Matters relating to the Board and General Conference

(a) Views and recommendations by Member States

112. The General Conference should meet every two years (2) and the Statute should be amended accordingly. (1)

113. Expenditures relating to the Board of Governors should be reduced. (1)

114. Membership of the Board should be based on an equitable system of rotation with a view to ensuring that all Member States can, in practice, become Members. (1)

(b) Supplementary information and comments by the Secretariat

115. In August 1963 the Director General prepared, in response to an inquiry from the Governor from Pakistan, a study of some of the statutory implications of holding the regular session of the General Conference biennially. The matter is also touched upon in the memorandum the Director General submitted to the Board in February 1967 in connection with the recommendations of the General Assembly's Ad Hoc Committee of Experts to Examine the Finances of the United Nations and the Specialized Agencies.

Co-ordination

(a) Views and recommendations by Member States

116. The Agency should establish closer collaboration with the specialized agencies so as to obtain their help in matters relating to their special fields. (3) It should establish joint divisions with them. (1)

117. Activities relating to medicine and agriculture should be jointly financed by the Agency, WHO and FAO. Activities relating to training should, as a rule, be jointly financed by the Agency and UNESCO. (1)

118. Information might be sought from the specialized agencies to assess the adequacy of interorganizational liaison and co-operation. (1)

(b) Supplementary information and comments by the Secretariat

119. The question of co-ordination is referred to in paragraphs 7, 25 and 31 of Annex B.

120. Over the years the Agency has taken the following steps to promote co-operation with other United Nations organizations:

(1) The conclusion of relationship agreements with the United Nations and with UNESCO, ILO, WHO, WMO, ICAO, FAO and IMCO;

(2) The exchange of liaison officers on a continuing basis between the Agency and WHO;

(3) The approval last December by the Directors General of the Agency and WHO of a comprehensive set of guide-lines for planning and carrying out programmes at their Headquarters, in the regions and in the field;

(4) The establishment in 1964 of a Joint Division with FAO, which was placed on a permanent basis in 1966;

(5) As mentioned in paragraph 78 above, the Agency is in close touch with IBRD about a study which the latter is making of the prospects for nuclear power and maintains close working relations with it in respect of work in the nuclear power field; and

(6) The Agency also takes full part in all the multilateral co-ordination procedures and machinery of the United Nations family.

121. Outside the United Nations family, the Agency has agreements with ENEA and IANEC, and is negotiating an agreement to establish relations with the Educational, Scientific, Cultural and Health Commission of OAU. It also has close working relations with several other intergovernmental organizations.

122. In practice as well as on paper, co-ordination with other organizations inside and outside the United Nations family is generally close and effective, and this is reflected in numerous joint activities. The help of other agencies is sought whenever it appears that they can make a technical contribution to the Agency's work. Thus, for instance, the United Nations co-operated in the Special Fund study which the Agency executed in the Philippines, in the power and desalting missions sent out to Latin America last year, as well as in most previous studies or missions of a similar character; WHO's help is being sought for several projects in radiation protection and the life sciences that are now being developed; UNESCO and the Agency co-ordinate their training and educational activities and take part in certain joint programmes; WMO and the Agency co-operate fully in much hydrological and all meteorological work involving the use of isotopes. Numerous other examples could be given.

123. With regard to the possibility of obtaining more help or finance from other agencies, most, if not all, agencies in the United Nations family find that they have insufficient resources to meet their own priority needs. However, the two Directors General concerned have agreed that they will seek the approval of their governing bodies for an equal division of any increase in the costs of the Joint FAO/IAEA Division that are to be met from the assessed budgets of the two organizations. There is no doubt, moreover, that major, new atomic energy projects in agriculture, water resources development and entomology will require close co-operation with the agencies concerned.

Personnel

(a) Views and recommendations by Member States

124. A larger proportion of the staff should be drawn from the developing countries and geographical distribution should be given more weight than financial contributions in selecting the staff. (2) Increasing the number of officials from developing countries would enhance the Agency's understanding of the problems of these countries. (1)

125. The Agency should study and apply the revisions of earlier decisions affecting the question of geographical distribution of staff made by the General Assembly three years ago. (1)

(b) Supplementary information and comments by the Secretariat

126. The basic principle in recruiting the staff of the Agency is set out in Article VII.D. of the Statute, which reads as follows:

> The paramount consideration in the recruitment and employment of the staff and in the determination of the conditions of service shall be to secure employees of the highest standards of efficiency, technical competence, and integrity. Subject to this consideration, due regard shall be paid to the contributions of members to the Agency and to the importance of recruiting the staff on as wide a geographical basis as possible.

127. The Appendix to Annex B contains the names of 69 developing Member States of the Agency. That part of the Professional staff of the Agency which is "subject to geographical distribution" includes 64 staff members from 30 of the States listed. These 64 staff members represent 30% of the staff "subject to geographical distribution".

128. If the aggregate contributions of the 69 developing countries to the Agency's budget is used as a guide to the number of staff members that should be drawn from those countries, the desirable total of the staff from this group of countries would be about 37. If it is considered that at least one staff member should be drawn from each Member State, the desirable total would obviously be higher.

129. The procedure for the recruitment of staff in the category subject to geographical distribution is as follows. Whenever a vacancy occurs, the Director General sends a formal circular letter to all Member States inviting their attention to the vacancy and enclosing a description of the qualifications that will be required by the incumbent of the post. Three months are given to Member States to submit names of qualified candidates. The nominations are considered by the Head of the Division or Unit concerned and his recommendations are submitted to an internal committee which makes recommendations in turn to the Director General in each case.

130. The response to these circular letters varies. In the case of administrative posts falling vacant, as many as 40 nominations have been received. In the case of scientific and technical posts, the response has often been disappointing and the number of nominations has varied from one to ten.

131. During the last two years, 37 Member States did not submit any applications in response to the Director General's circulars; of these, 30 were developing Member States.

132. It is presumed that the General Assembly's decisions referred to in paragraph 122 above are those in Resolution 1852 (XVII), which recommended that account be taken by the United Nations of the fact of membership, Members' contributions and their populations, and of the relative importance of posts at different levels, and that no Member State should be considered 'over represented' if it had no more than five nationals on the staff of the United Nations. The latter criterion relates to the United Nations, which has a Professional staff much bigger than that of the Agency; the relatively small number of Professional staff subject to geographical distribution would make this principle unworkable for the Agency. In Resolution 2241 (XXI), adopted at its last session, the General Assembly stated its belief that, "as a temporary measure and under the existing conditions, increased recruitment on the basis of fixed-term contracts, especially in the case of developing countries, might help to achieve a balanced geographical distribution". It also invited the Secretary General to give preference to candidates from "inadequately represented countries" and to take into account the level of appointment, together with the number of posts, in determining the desirable range of posts for individual countries.

133. It may be mentioned in this connection that several years ago UNESCO adopted a system which was based on the "level of appointment". It was subsequently discarded and, so far as is known, it is not used by any of the other United Nations organizations.