

THE PROVISION
OF TECHNICAL ASSISTANCE
BY THE AGENCY
WITH SPECIAL REFERENCE
TO 1975

Report by the Director General

GC(XX)/INF/161

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INTERNATIONAL ATOMIC ENERGY AGENCY

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List of abbreviations

Agency	International Atomic Energy Agency
CERN	European Organization for Nuclear Research
ECOSOC	Economic and Social Council of the United Nations
IAEA	International Atomic Energy Agency
ILO	International Labour Organisation
ITU	International Telecommunication Union
SIDA	Swedish International Development Authority
Trieste Centre	International Centre for Theoretical Physics at Trieste
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
WHO	World Health Organization
<hr/>	
German D.R.	German Democratic Republic
Germany, F.R.	Federal Republic of Germany
Korea, R.	Republic of Korea
Libyan A.R.	Libyan Arab Republic
Rep. of South Viet-Nam	Republic of South Viet-Nam
Syrian A.R.	Syrian Arab Republic
USSR	Union of Soviet Socialist Republics
UK	United Kingdom of Great Britain and Northern Ireland
United Rep. of Cameroon	United Republic of Cameroon
United Rep. of Tanzania	United Republic of Tanzania
USA	United States of America

NOTES

All sums of money are expressed in United States dollars.

The technical assistance described in this report is classified under the following ten fields of activity:

<u>Code</u>	<u>Field of activity</u>
0	General atomic energy development
1	Nuclear physics
2	Nuclear chemistry
3	Prospecting, mining and processing of nuclear materials
4	Nuclear engineering and technology
5	Application of isotopes and radiation in agriculture
6	Application of isotopes and radiation in medicine
7	Application of isotopes and radiation in biology
8	Application of isotopes and radiation in industry and hydrology
9	Safety in nuclear energy

Part I. INTRODUCTION

1. Following its usual practice, the Board of Governors has requested the communication to the General Conference of the material it used in reviewing the provision of technical assistance by the Agency, with special reference to 1975; this material is accordingly reproduced in the present document. The review was carried out pursuant to paragraph 20 of the Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the Agency. [1]
2. The use of the resources placed at the Agency's disposal, in the form of voluntary contributions, gifts in kind, multi-bilateral funds, and UNDP funds for small- and large-scale projects, for the provision of technical assistance is reviewed in this document.
3. The three principal elements of the technical assistance provided are expert services, equipment and fellowships. The main objectives of the assistance are to promote the transfer of skills and knowledge relating to the peaceful uses of atomic energy, to support the efforts made by recipient countries to carry out their atomic energy activities more efficiently and safely, and to ensure that the knowledge acquired can continue to be applied after the provision of assistance by the Agency has been completed. The achievement of the latter objective, however, depends largely on the ability of Governments to make adequate facilities available and to recruit and retain the requisite number of qualified staff.
4. In 1975, 77 countries received technical assistance in one form or another from the Agency, as shown in Fig. 4B and Table 7 [2]. Three fourths of all assistance provided related to the application of isotopes and radiation in agriculture, nuclear engineering and technology, to prospecting, mining and processing of nuclear materials, the application of isotopes and radiation in industry and hydrology, and to nuclear physics.
5. The assistance, including assistance in kind, was provided through the services of 341 experts, lecturers and visiting professors, the supply of equipment to a value of about \$3 390 000, and 765 fellowship awards for individual study, scientific visits, two study tours and other short-term training projects.
6. The resources allocated for carrying out the Agency's 1975 technical assistance programme amounted to approximately \$9 810 000 (Table 1), whereas the total value of the technical assistance actually provided in 1975 was about \$8 554 000 (Tables 4 and 7), which includes payments against 1975 and prior years' obligations, as well as assistance in kind, and represents an increase of \$1.8 million or about 27% over the sum of \$6 742 000 provided in 1974 (Table 4), but does not include the unliquidated obligations and assistance in kind outstanding at the end of the year.
7. As in earlier reports on the provision of technical assistance by the Agency [3], details are given below regarding activities in which developing countries have shown special interest in 1975, followed by information concerning, among other matters, the difficulties experienced by UNDP relating to the technical assistance financed under that programme.

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

[2] The principal statistical tables are given in Annex I to this document.

[3] See, for example, document GC(XVIII)/INF/148, which provides information in paragraphs 8-23 on the use of nuclear techniques in agricultural research, and GC(XIX)/INF/154, containing information in paragraphs 24-38 on the use of nuclear techniques in industry and hydrology, other major areas of interest to Governments.

A. TECHNICAL CO-OPERATION ACTIVITIES IN WHICH GOVERNMENTS
HAVE SHOWN SPECIAL INTEREST

1. Nuclear power plant siting

8. In the last two reports information was given on the assistance available from the Agency to the developing countries which are considering the introduction of nuclear power. [4] One of the major activities that has to be carried out during the preparatory stages, namely, the selection of a site for a nuclear power station, was only briefly touched upon. An outline of the work involved in finding an appropriate location follows, the first in a series of descriptions of important activities that make up a nuclear power project.

9. When a decision has been made to construct a nuclear power plant, the Government of the country in which the plant is to be located should ensure that a minimum number of steps are taken, as part of the planning effort, before giving its authorization for plant construction to begin. The steps related to site selection are:

- (a) Organization of a regulatory body responsible for nuclear safety problems; among other duties the regulatory body would promulgate the fundamental criteria for the selection of a nuclear power plant site;
- (b) Study of the territory of the country by the applicant (the utility or governmental department that is applying for the authorization to construct and operate the proposed nuclear power plant) to select five or six sites to be investigated during a preliminary survey;
- (c) Of the locations investigated during the preliminary survey, selection of one or two sites for a final evaluation; and
- (d) After a careful and comprehensive study of the selected site, definition of the site-related design bases and approval of the site.

(a) Organization of a regulatory body, definition of the site criteria and the preliminary site survey

10. The organization of a regulatory body, if it has not yet been established, and the definition of the criteria to be used for evaluating a site, represent the first step to be taken in the selection of a site. Subsequently, the experts designated by the applicant should prepare the preliminary site reports. During this phase attention must be paid to the identification of the following:

- (a) The factors which would automatically preclude the selection of a site from the safety point of view; and
- (b) The characteristics of the site that have to be compensated for in the design of the plant from the safety point of view.

The applicant will also have to pay attention to the other characteristics affecting the suitability of a site which are not safety-related, for example, good access for heavy-load components such as the pressure vessel, adequate cooling conditions and factors of importance from the electrical distribution point of view. The study of the characteristics of sites during the preliminary survey is normally made by experts from the country concerned, using the criteria developed by the Agency or by regulatory bodies of other countries with greater experience. The characteristics of the first five or six sites are identified and compared in the overall report on the preliminary survey

[4] GC(XVIII)/INF/148, paras 24-40, and GC(XIX)/INF/154, paras 8-17.

(b) Detailed survey of one or two sites

11. The narrowing of the choice to one or two sites from the five or six studied during the preliminary survey is performed by the applicant in co-operation with specialists from the regulatory body. Towards the end of this stage the Government may request the Agency, or an advanced country from which bilateral aid is received, to provide assistance in reviewing the findings of the preliminary survey. If the Agency was requested and agreed to do this work, it would send a mission, consisting of external consultants and its own specialists, to the requesting country. Based on the study of the preliminary survey reports - prior to their arrival in the country - and a visit to the more promising sites, the members of the mission would discuss the problems with the local experts and make recommendations on the action that should be taken next. In particular, if the overall report on the preliminary survey is sufficiently comprehensive, they would recommend proceeding to the detailed investigation of the one or two sites considered to be most favourable.

(c) Definition of the site-related design bases and approval of the site

12. This final study of one or two sites is usually carried out by a specialized engineering firm which has the necessary expertise in many different but relevant fields, such as meteorology, hydrology, seismology, geology, tectonics, ecology, hydrogeology and nuclear safety technology. In these studies two sets of factors are considered, namely, the characteristics of the site:

- (a) which may have an impact on the plant, such as the likelihood of earthquakes and the possible degree of their severity, flooding and strong winds; and
- (b) which are important in defining the impact that the plant may have on the environment.

13. In both cases attention is particularly paid to those factors that would preclude the selection of a site, because it would be extremely difficult and costly to design a safe plant in those circumstances. An example is the presence of an active fault in the earth's crust that crossed the plant site: the displacement of this fault in the event of an earthquake could not be compensated for satisfactorily in the plant design. Other factors are also studied in defining the site-related design bases, that is, the specifications that have to be met during the design phase so that the plant, when constructed, can withstand the effect of extreme phenomena such as earthquakes and hurricanes.

14. As a prerequisite to the completion of the necessary studies and the evaluation of these characteristics, it is essential that the specialists charged with the responsibility of selecting sites study the literature on the subject and perform a substantial number of field survey investigations and measurements. The amount of staff time and money needed for these investigations constitutes a small fraction of the overall cost of the plant. However, the devotion of adequate attention to this work may have a large influence on the cost of construction of the plant. In particular, the inclusion of a sound design basis against earthquakes may increase the construction cost of the plant by a few per cent. On the other hand, lack of sufficient attention to siting work could have long-lasting, irreparable consequences.

(d) Site criteria

15. As mentioned above, one of the first decisions of the regulatory body of importance to a nuclear power project is the definition of the criteria to be used for evaluating the sites. Up to a few years ago the only source of information on siting criteria was national safety codes and guides. Thus, it was usually difficult for a country embarking on a nuclear power programme to decide on the set of criteria to be used for evaluating the safety of the plant and of the site. The Government's local siting staff could also run the risk of preparing site-related design bases that would not conform to the standards used by many nuclear power plant designers, resulting in protracted delays and additional expense.

16. To cater for these needs the Agency is now developing safety codes and guides - for which wide international agreement would be sought - governing all aspects of programmes for the construction and operation of nuclear power plants. In the future there will be a standard framework of reference for evaluating the safety of nuclear power plants, and siting is one the areas for which safety codes and guides are being developed. At present, preliminary drafts of the following documents have been prepared: a safety code on siting and safety guides on (i) earthquake in the siting of nuclear power plants, (ii) the aseismic design of nuclear power plants, (iii) atmospheric diffusion, and (iv) extreme meteorological phenomena. These drafts will be reviewed by panels of experts and the agreement of the regulatory bodies of the countries that have active nuclear power programmes will be sought before the documents are promulgated as internationally accepted codes and guides.

(e) Agency capability to provide assistance for siting

17. The assistance available from the Agency to its Member States in the execution of the tasks involved in the various stages of the siting of a nuclear power plant may include the following:

- (a) The provision of consultants to assist the Government and the applicant in collecting and evaluating the information needed to prepare the siting surveys. Assistance of this kind has been provided to Kuwait, Mexico and Yugoslavia;
- (b) The dispatch of safety missions composed of 2-5 experts, including Agency staff members, to give advice on the survey for the selection of the final site, the approval of the site and the definition of the site-related design bases. Assistance of this kind has been provided to Bangladesh, Brazil, Republic of China, Chile, Egypt, Greece, Indonesia, Iran, Republic of Korea, Mexico, Pakistan, Philippines, Singapore, Thailand, Tunisia, Turkey and Yugoslavia;
- (c) The dispatch of a siting mission consisting of 2-5 experts, including Agency staff members, to evaluate the findings of the survey investigations and the measurements, as well as to evaluate the design bases proposed by the engineering firm under contract to the applicant. Assistance of this kind has been provided to Brazil, Republic of China, Iran, Republic of Korea, Mexico and Pakistan.

2. Nuclear power training courses in 1975

(a) Training course on nuclear power project planning and implementation

18. In 1974, following the publication of the Agency's updated Market Survey for Nuclear Power in Developing Countries, it became obvious that the interest in the use of nuclear power as a primary energy source - as a result of the sudden increase in the market price of oil - was not confined to a dozen developing countries. The ground swell of concern caused by this shift in economic parameters and the commercial interests involved made the Agency the logical choice as the source of information for the planning and implementation of national nuclear power programmes. To help meet this need the Agency proposed a series of special training courses to assist its Member States about to embark upon a nuclear power programme, and a panel of three experts was convened in September 1974 to advise on the relevant training needs. The experts prepared a syllabus for a training course on the planning and implementation of nuclear power projects. In December 1974 a second panel of eight experts reviewed the recommendations of their predecessors and modified what has become the official syllabus for this first special course.

19. In response to an invitation from the Government of the Federal Republic of Germany, the first course was held at Karlsruhe from 8 September to 17 December 1975. Thirty-five participants from 20 developing Member States completed the course, which was designed to provide key engineers and technical managers with training useful in planning and implementing nuclear power projects. As the course was conducted in English, participants were required to show proficiency in that language before they were selected to attend. There were 72 applicants for the course, of whom 45 were selected; 36 started and 35 finished the course.

Of the 20 countries which sent participants, ten have power reactors in operation or under construction and five have definite plans to embark on nuclear power programmes within the next few years.

20. The course was not highly academic, but rather practical in scope, and was organized in such a way that the transfer of experience could be accomplished along with the transfer of up-to-date information. There were 148 specialists who came to lecture and participate in the discussions on the following general subjects:

- (a) Introduction to nuclear power;
- (b) The fuel cycle;
- (c) Nuclear safety;
- (d) The legal framework of nuclear power;
- (e) Preliminary aspects of nuclear project planning;
- (f) Preparation for a nuclear power plant;
- (g) Contracts for construction;
- (h) Fuel procurement;
- (i) Power plant construction; and
- (j) Power plant start-up and operation.

21. The Agency recognized its responsibility to assure the international character of the course and it provided 16 lecturers from its own staff and 19 lecturers from outside the Federal Republic of Germany. The course consisted of lectures, discussions, case studies, and tours to reactor sites and industrial firms. Each lecturer provided a written summary of his lecture, which was duplicated and distributed to the participants. At the conclusion of the course each participant shipped home about 30 kg of documents, books, and lecture notes for use as reference material.

22. The Agency considers that the success of the first Karlsruhe course was largely due to the able management of the Course Director and his staff and to the close and cordial co-operation between the Agency and Karlsruhe staffs. The course will be repeated at Karlsruhe, starting on 6 September 1976; in addition, a similar course is being held in English at Argonne, United States of America, from 6 January to 16 April 1976, and in French at Saclay, France, from 30 March to 9 July 1976. Furthermore, a second-phase course on "nuclear power project construction and operation management" is being prepared at Argonne to start on 8 September 1976. The Agency considers these courses to be of primary importance to the developing countries which foresee that nuclear power might be of interest to them within the next decade.

(b) Seminar on nuclear power planning

23. Although the Karlsruhe course was designed for working-level technical administrators and engineers, there is also a need to provide training for high-level governmental and utility officials who will make decisions and establish policy regarding possible nuclear power programmes. To meet this need, the interregional seminar on the preparation and implementation of nuclear power projects was conducted at Kingston, Jamaica, from 9 to 20 June for 35 foreign participants. This seminar was designed to provide an overview of matters related to the establishment of nuclear power projects, whereas the Karlsruhe course went into far more detail. The Jamaica seminar successfully brought together nuclear power experts and policy makers from the developing countries for an intensive two-week exchange of information and discussion. Although the energy problems

of the developing countries are similar throughout the world, it is felt that this seminar will be more effective in the future if it is organized on a regional basis so that more attention can be given to the problems of the individual participating countries. There is also scope for holding seminars of this kind on a national basis, in order to cater for more persons who are directly involved in the production and utilization of large amounts of electric power.

3. Technician training

(a) Maintenance and repair of electronic equipment

24. The growth in the number and the range of the peaceful applications of atomic energy that are being carried out on a routine basis in the developing countries has created a demand for more nuclear and electronic equipment to support work programmes in, for example, agriculture, industry, clinical medicine, medical dosimetry, the life sciences and nuclear engineering. Consequently, the acquisition of numerous pieces of modern, often highly sophisticated electronic equipment has created a requirement for more well-qualified electronics technicians to maintain and repair this equipment in an effective manner.

25. After holding a regional training course in 1964 and 1966 for electronics technicians, the Agency decided to organize the next course for participants from a number of regions. It was held in 1968 on an interregional basis and was so successful that plans were immediately made for its repetition; it has taken place annually since 1970. These interregional courses have all been held at ILO's International Centre for Advanced Technical and Vocational Training at Turin, Italy, and have been financed mainly by UNDP.

26. The object of such courses is to train technicians, engineers and scientists concerned with nuclear and allied instrumentation in the fundamental principles of electronics, the current techniques applied in various measuring systems, the utilization of recent developments in electronics, integrated circuit techniques, the use of semiconductor nuclear radiation detectors, measuring techniques, instrumentation diagnostics, functional checking, as well as the transfer of practical information relating to the design, utilization, maintenance and repair of electronic equipment and instrumentation.

27. The course held in 1975 was attended by 16 participants from 12 different developing countries; it lasted 13 weeks and consisted of lectures, discussions, practical exercises, small individual projects and study visits to other institutions and enterprises which make use of or manufacture electronic instruments, including CERN in Geneva.

28. The sustained demand for this training - the number of candidates consistently far exceeds the number of available places - is such as to ensure the regular repetition of such courses for some years to come. To make more efficient use of the demonstration equipment purchased for the courses, it was planned to hold two courses in 1976 and, beginning in 1977, three courses a year; the second and third courses each year would be shared with, or held exclusively for, participants selected by ILO, ITU, UNESCO, WHO or UNIDO. Lack of UNDP funds has made it necessary to postpone the scheduling of more than one course a year.

(b) Workshop on technicians' training

29. At the request of several RCA countries [5] in the Asia and the Pacific region a workshop was held in Seoul, Republic of Korea, from 24 to 31 October 1975. Twenty-four representatives from nine countries, ILO, UNESCO, WHO, Colombo Plan Bureau and the IAEA participated in the workshop and formulated recommendations on the assistance which the participating countries need from the Agency: the IAEA should collect and disseminate

[5] The Member States which have acceded to the Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology; the text of the agreement is reproduced in document INFCIRC/167.

information on available technicians' training facilities, serve as a channel for the interchange in the region of teaching staff and curricula for the training of technicians, and organize short courses for the training of instructors of technicians in the areas covered by atomic energy. Furthermore, it was suggested that the IAEA, in association with the other international organizations participating in the workshop, should advise on the curricula used for the training of nuclear laboratory technicians and evaluate the programmes of technician training in the countries of the region.

30. In their final recommendations the representatives of the countries participating in the workshop also suggested that the IAEA should initiate action for the establishment of a committee to investigate and report on the feasibility of setting up a regional centre for the training of nuclear laboratory technicians. This committee should also make recommendations on the laboratory equipment and facilities needed for such a training centre. Unfortunately, the Agency does not have sufficient resources to become involved in the establishment of centres, which explains why the Agency's policy limits its assistance to regional centres which are already in operation. Nevertheless, in carrying out the clearing-house functions, as requested in the recommendations of the workshop, the Agency will be assisting the RCA countries in arranging for the training of technicians within the framework of a programme of regional co-operation.

B. OTHER DEVELOPMENTS

1. UNDP's financial difficulties

31. During the last part of 1975 UNDP experienced a cash liquidity crisis; the increased cash outflow that precipitated this crisis was the consequence of a combination of two factors, an overall increase in the delivery rate of UNDP-funded assistance, as compared with 1974 and prior years, and an unexpectedly high rate of inflation. UNDP's income did not keep pace with expenditures for a number of reasons, for example:

- (a) The pledges of voluntary contributions did not reach the anticipated level;
- (b) A sizable sum of voluntary contributions had not yet been paid;
- (c) The assessed programme costs had not been paid on time by some of the developing countries;
- (d) Most of the available cash resources consisted of non-convertible currencies; and
- (e) Somewhat more than half of the operational reserve was tied up in non-liquid assets.

32. At the end of 1975 it was estimated that if no new additional contributions were received UNDP would experience a deficit for the 1972-1976 indicative planning figure (IPF) period of approximately \$34 million. It would accordingly be necessary to introduce certain constraints on programme implementation in 1976 in order to reverse the current trend of expenditure. At the same time the Administrator appealed to Governments to make additional voluntary contributions to UNDP in 1976 and to pay their 1976 pledges early in the year. He also urged Governments to pay all overdue amounts and those Governments contributing in non-convertible currencies to allow the conversion of these donations into currencies needed by the Programme.

33. The planning of the use of UNDP cash resources in 1976 is based on the introduction of an overall expenditure ceiling for each individual recipient country. An attempt was made to allow for as orderly a continuation as possible in each country - on a reduced scale - of the development assistance activities which the recipient Government considered as constituting the best use of the UNDP funds likely to be available. While the cumulative cost of honouring the formal commitments entered into on UNDP's behalf by the executing agencies

had to be taken into account, country by country, UNDP's Administrator felt that in exercising financial restraint wherever possible, to slow down UNDP's outward cash flow, care had to be taken to ensure that the interests of the least developed countries and the "inter se" equity among developing countries, as reflected in their IPFs, were safeguarded to the maximum extent possible.

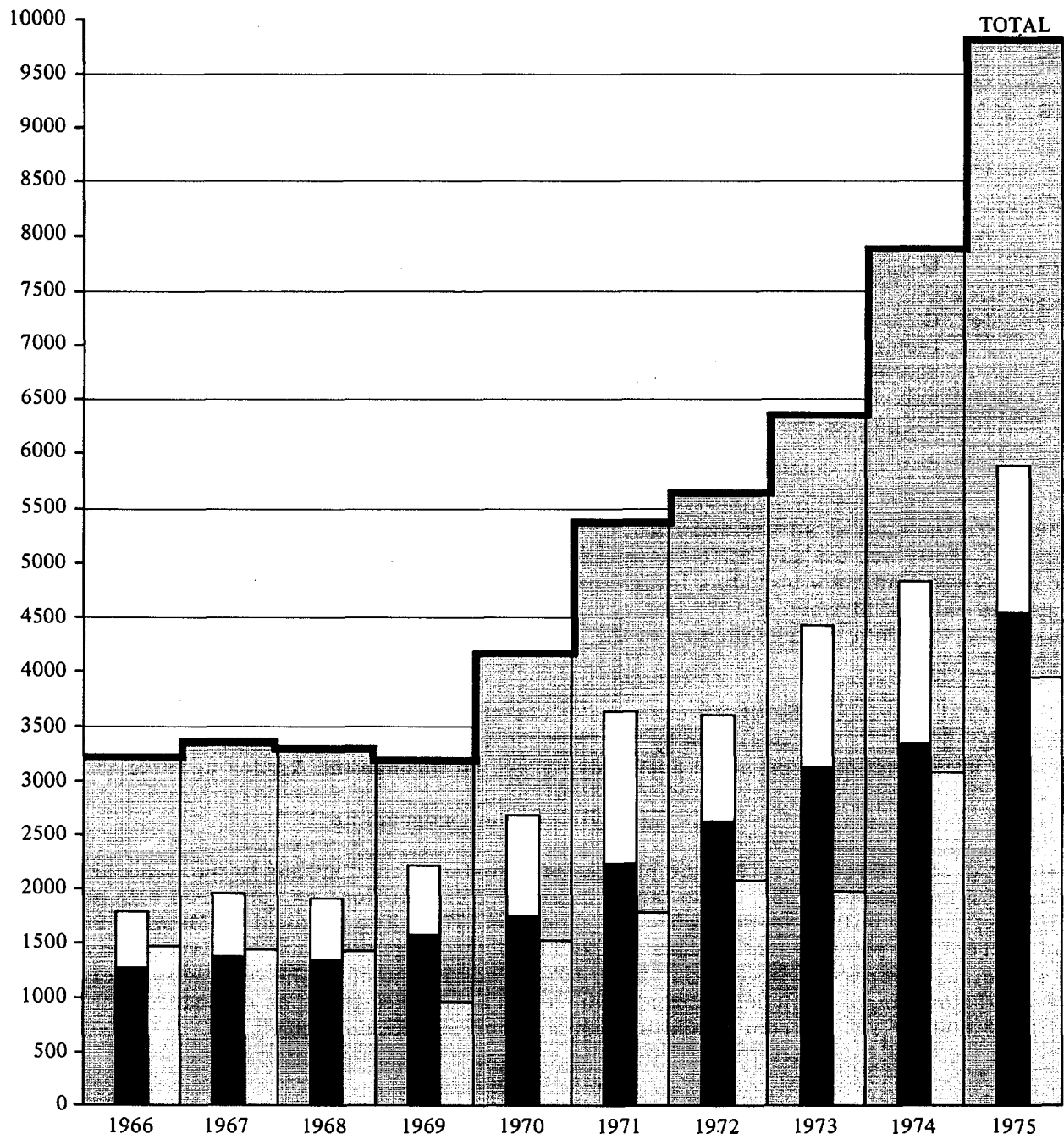
34. The effect of UNDP's current financial difficulties on assistance being provided through the Agency on UNDP's behalf will be a general slow-down and some activities, scheduled to commence in 1976, will be postponed. It is assumed that in establishing expenditure ceilings for 1976, the UNDP resident representatives have made provision for small increments of assistance which Governments may request in 1976 and need urgently. The UNDP resident representative in each recipient country was instructed to consult with the Government on all aspects of the revised 1976 expenditure plans; accordingly, it can be assumed that the scheduling and rephrasing of UNDP inputs in respect of the assistance to be provided in 1976 is based on the priorities established by each Government.

2. Subcontracting

35. An interesting project that received UNDP assistance through the Agency in 1975 was the appraisal and pre-investment study of the uranium deposits at Sierra Pintada, Argentina. The task of carrying out the study was subcontracted to a commercial organization, since it was essential that the study be completed within the span of a few months. The objective of the project was to make a preliminary study of all the available background information relating to the technical and economic feasibility of mining and refining the uranium ore found in the Sierra Pintada region for use in connection with Argentina's nuclear power programme. The subcontractor's report confirmed the accuracy of the findings of the National Atomic Energy Commission and made constructive recommendations on a number of technical matters, including the draft invitation to tender in respect of a contract for a full-scale economic feasibility study, integrated engineering plans, refinery construction and the associated ore-processing start-up programmes.

36. The Government of Argentina has expressed satisfaction with the report and with the speedy implementation of the study. It is likely that the Agency will make extensive use of subcontracting in the future, especially in carrying out preliminary and feasibility studies on the various aspects of nuclear power programmes.

FIGURE 1A
RESOURCES AVAILABLE FOR
AGENCY TECHNICAL ASSISTANCE PROGRAMMES: 1966-1975
(in thousands of dollars)



Agency monetary	1263	1380	1348	1586	1749	2224	2636	3124	3348	4540
Assistance in kind	528	570	565	658	932	1410	968	1299	1485	1332
UNDP monetary	1462	1431	1422	981	1513	1775	2072	1964	3082	3941
TOTAL	3253	3381	3335	3225	4194	5409	5676	6387	7915	9813

Agency monetary
 Assistance in kind
 UNDP monetary

Part II. ANALYSIS OF THE ASSISTANCE PROVIDED

A. AVAILABLE RESOURCES

1. General

37. The resources available to the Agency in 1975 for the provision of technical assistance came to \$9 813 000 (see Fig. 1A and Table 1), which is 24% higher than the figure for 1974 (\$7 915 000) and is made up as follows:

- (a) UNDP, \$3 941 500 in cash: \$1 245 500 for small-scale projects and \$2 696 000 for large-scale projects;
- (b) Income to Operating Fund II, including voluntary contributions of Member States transferred from the General Fund, \$4 540 000; and
- (c) Gifts in kind (services of cost-free and partly cost-free experts and lecturers, grants of equipment in support of approved technical assistance projects, Type II fellowships and training course stipends) valued at \$1 332 000. Of this total, \$1 294 000 was made available in respect of the regular programme and \$38 000 for UNDP projects.

2. UNDP

38. To the total of \$3 941 500 spent by the Agency to carry out the UNDP field programme in 1975 (\$237 500 for assistance to intercountry projects and \$3 704 000 for assistance to country programme - including large-scale - projects) \$1 135 200, the unliquidated obligations carried forward to 1976 (the comparable figure a year ago was \$1 043 600), should be added to give a clearer picture of the total UNDP resources at the Agency's disposal in 1975.

39. Cost sharing: The UNDP cash resources shown above (and in Fig. 1A and Table 1) include \$75 755 made available by the Government of Greece under cost-sharing arrangements in respect of large-scale assistance provided through the Agency in 1975.

3. Agency's regular programme

40. As at 31 December 1975 the pledges of voluntary contributions to the General Fund for 1975 had exceeded 93% of the target figure of \$4.5 million, as compared with about 103% of the \$3 million target figure in respect of 1974. The payment by Member States of current and prior years' pledges (\$4 225 000, the largest amount received in any year to date, as compared with \$3 093 400 in 1974), was reflected in the income to Operating Fund II (totalling \$4 540 000 from all sources in respect of 1975, as compared with \$3 348 000 for 1974), from which the regular programme is financed.

4. Gifts in kind

41. The estimated value of the assistance in kind made available for 1975 programmes was \$1 331 900, which is 10.3% lower than the figure of \$1 484 800 for 1974. The higher sum in respect of 1974 is due to the receipt in that year of SIDA funds amounting to approximately \$229 900 for the provision of large-scale assistance, of which only \$1400 was expended; a further amount of \$74 000 was committed in 1974; the balance was either spent or committed in 1975.

42. This situation resulted in a sizable decrease in the amount available from all sources for equipment in 1975 (from \$494 200 to \$199 500), a nominal decrease in the value of cost- and partly cost-free expert services (from \$128 000 to \$114 100), whereas the in-kind resources for training increased by 18% (from \$862 600 to \$1 018 300, consisting of Type II fellowship and training course stipends). Equipment grants were provided as assistance in

kind by three Member States in 1975 (see Annex II. A), by the Federal Republic of Germany, Sweden and the United States of America.

43. Multi-bilateral funds: The new resources made available in 1975 under this heading amounted to \$109 000 (\$348 500 in 1974), for the financing of fellowships, training courses and large-scale assistance.

44. Host country contributions: The assistance provided by the Agency often involves a much larger financial commitment on the part of the recipient countries; as this is in their own interest, it is understandable that the value of the counterpart staff and facilities made available by Governments is not reflected in the financial statistics in this report. The value represented by the lecturers and other facilities made available by a Government that hosts a regional or interregional training project (see Annex III) is also not reflected herein. In this connection credit is due to the Federal Republic of Germany for the valuable assistance it rendered in preparing and carrying out the training course on nuclear power project planning and implementation. Likewise, France and the United States of America incurred considerable expense in 1975 in the preparation of a similar training course to be held in those countries in 1976.

5. Funds in trust

45. Assistance valued at about \$28 000 was provided by the Agency under funds-in-trust arrangements with two developing countries in 1975 which involved cash expenditures of \$27 480 and \$730 respectively.

46. The funds from which the costs of an associate expert made available by the Netherlands were met, as well as the assistance provided from SIDA funds, have been included in the "gifts in kind" data given above.

6. Use of resources

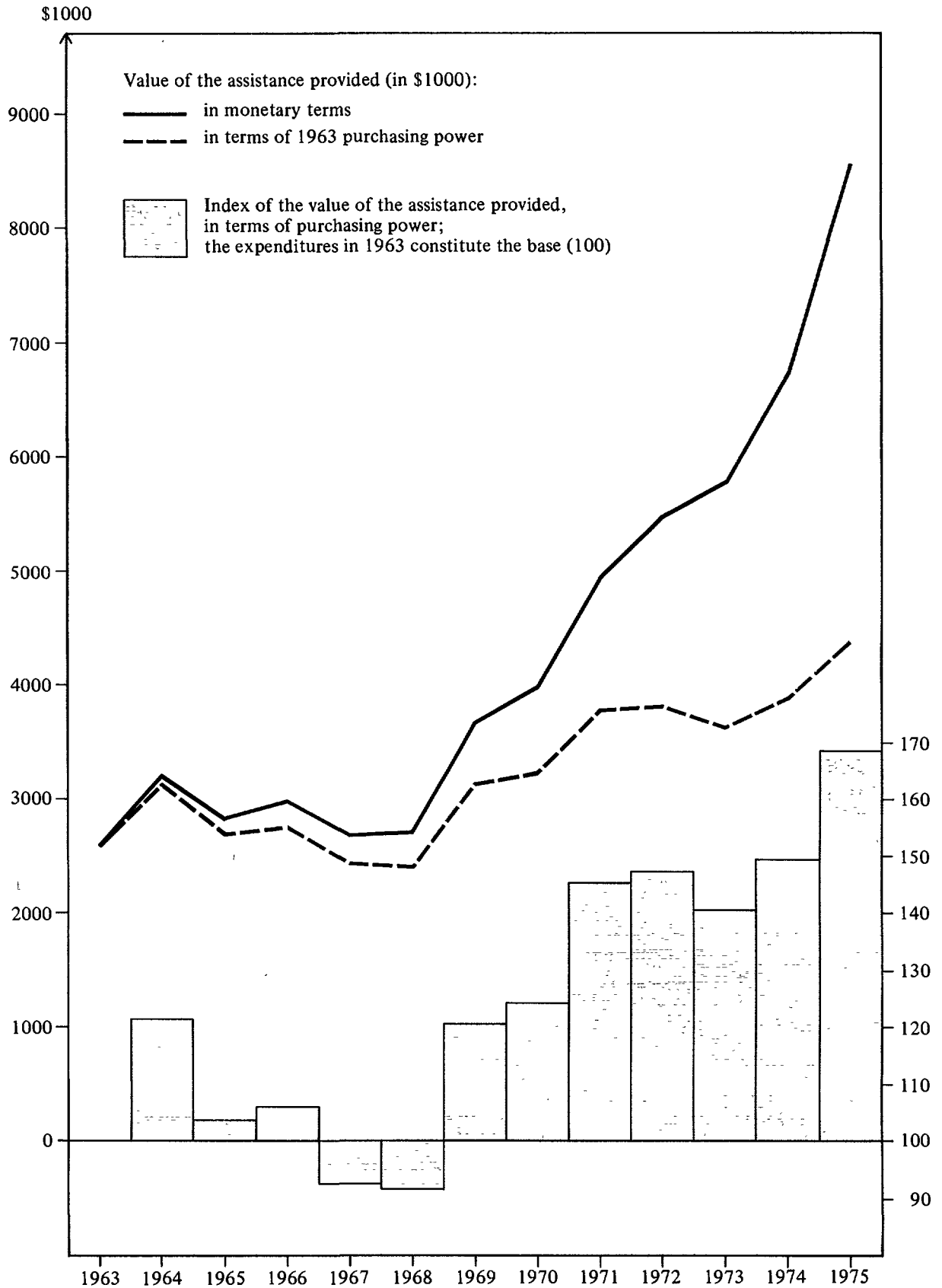
47. The total value of the technical assistance being provided by the Agency exceeded the \$13.3 million mark for the first time in 1975 (the figure for 1974 was \$11.1 million), and consisted of \$8 554 300 in assistance provided and \$4 826 900 in unliquidated obligations and assistance in kind in the process of being provided but still outstanding at the end of the year. More assistance was provided by the Agency in 1975 than in any previous year, that is, \$1 811 800 or about 27% more than in 1974, the year in which the largest amount of assistance up to then had been furnished. The breakdown of the total of unliquidated obligations and assistance in kind outstanding at 31 December 1975 is as follows: \$490 700 for expert services, \$2 179 200 for equipment and supplies and \$2 157 000 for fellowships.

48. As in earlier years, regular programme expenditures and unliquidated obligations at the end of 1975 exceeded the cash resources in respect of that year's regular programme, due to the fact that the former totals also include expenditures and obligations met from funds carried over in respect of assistance being provided under the regular programme for 1974 and prior years. The type and estimated value of the assistance in kind made available to the Agency in 1975 is given - by donor - in Annex II, which also includes information on possible assistance to projects not included in the 1975 regular programme owing to lack of funds.

49. The increases in the cash and in-kind resources made available for the Agency's regular programme and the assistance financed by UNDP are, in part, offset by inflation. The effect of the erosion in the purchasing power of the resources placed at the Agency's disposal is shown in Fig. 1B. The data given in Fig. 1B reveal that as compared with \$1000 of assistance provided in 1963, \$1000 of Agency aid was worth, for example, \$761 in 1971, \$631 in 1973 and only \$512 in 1975. In spite of the depreciation in the value of these resources, it can be seen that, in terms of 1963 purchasing power, the actual increase in the value of assistance provided surpassed the 40% mark in 1971, was about 40% in 1973 and more than 60% in 1975.

FIGURE 1B

VALUE OF THE TECHNICAL ASSISTANCE PROVIDED BY THE AGENCY: 1963-1975



B. DISTRIBUTION OF ASSISTANCE

1. By field of activity

50. A 1974:1975 comparison is given below of the amount of assistance provided in what were the top five fields of activity in 1975. Numerical data for all ten fields of activity are given in Figs 2A, 3A and 4A (which also include comparable data for 1974), in Fig. 5A and Table 5.

Assistance by field of activity and type: 1974 and 1975
(in thousands of dollars)

Field of activity	Year	Experts	Equip- ment	Fellow- ships	Share of total programme	
		\$	\$	\$	\$	%
Application of isotopes and radiation in agriculture	1974	453.6	534.5	348.2	1336.3	19.8
	1975	599.2	708.6	503.6	1811.4	21.2
Nuclear engineering and technology	1974	305.6	566.5	474.7	1346.8	20.0
	1975	357.9	493.3	592.7	1443.9	16.9
Prospecting, mining and processing of nuclear materials	1974	498.6	440.2	84.3	1023.1	15.2
	1975	848.3	378.3	132.1	1358.7	15.9
Application of isotopes and radiation in industry and hydrology	1974	219.3	501.5	167.6	888.4	13.2
	1975	143.0	812.7	138.5	1094.2	12.8
Nuclear physics	1974	148.3	112.9	244.7	505.9	7.5
	1975	175.2	231.1	243.8	700.1	8.2
Total	1974	1625.4	2155.6	1319.5	5100.5	75.7
	1975	2123.6	2674.0	1610.7	6408.3	75.0
Total assistance	1974	2103.6	2742.9	1896.0	6742.5	100.0
	1975	2854.0	3387.7	2312.6	8554.3	100.0

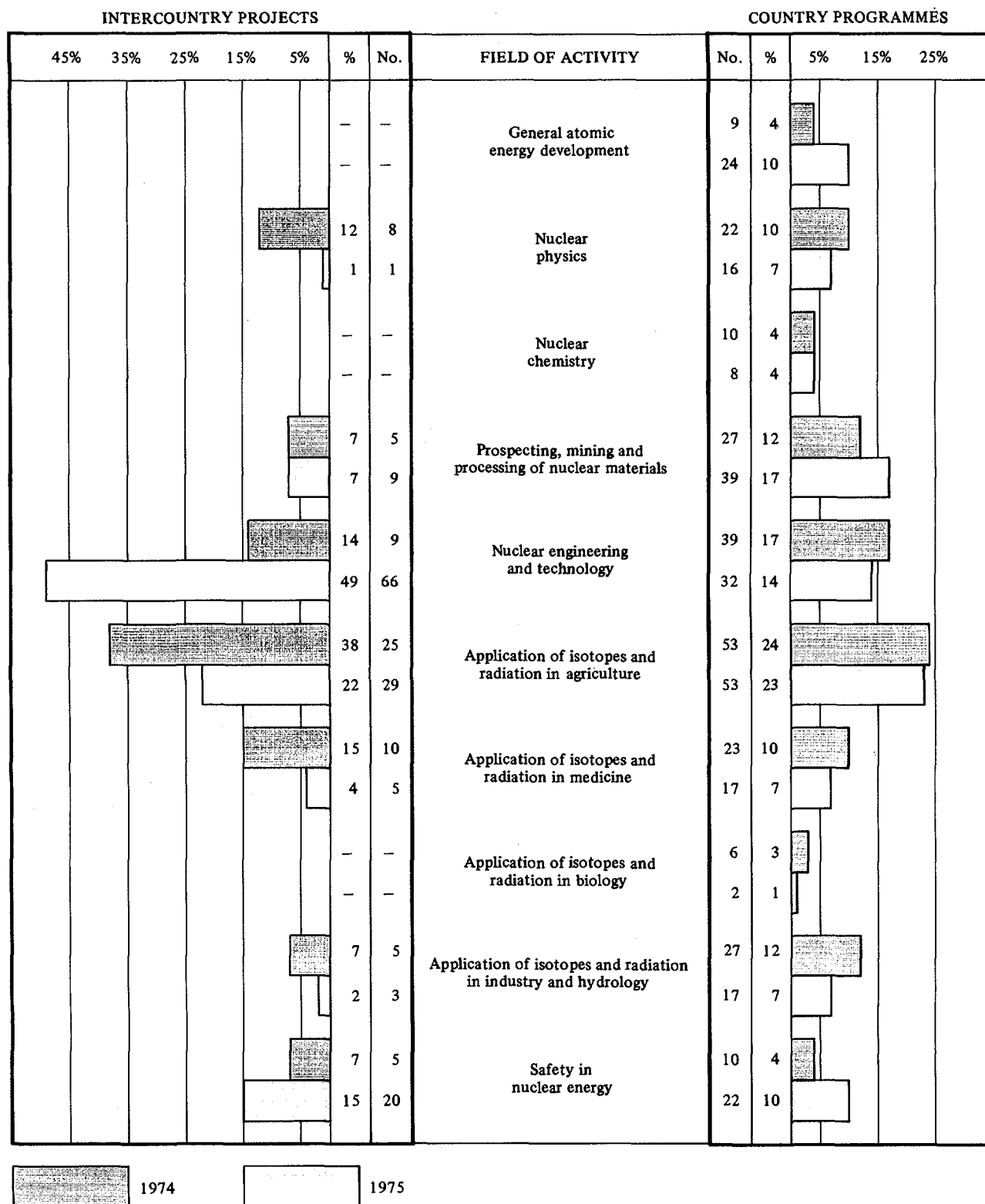
2. By region and country

51. Information on the distribution of technical assistance by region is summarized in Figs 5A and 5B. As in each of the years 1970-1975, more countries in Africa - namely, 19 - received Agency assistance than in any other region; 16 States in Asia and the Pacific and in Latin America received country programme assistance from the Agency in 1975, followed by the regions of Europe and the Middle East with 11 and 6 country programme recipients respectively. Nine additional countries - six in Africa, one in Europe, one in the Middle East and one in Latin America - participated in the Agency's programme of intercountry short-term training projects.

52. In 1975, 77 countries received technical assistance from the Agency, as compared with 74 countries and one regional organization in 1974. Including those which acted as hosts for short-term training projects and scientific visits, 25 countries both received and

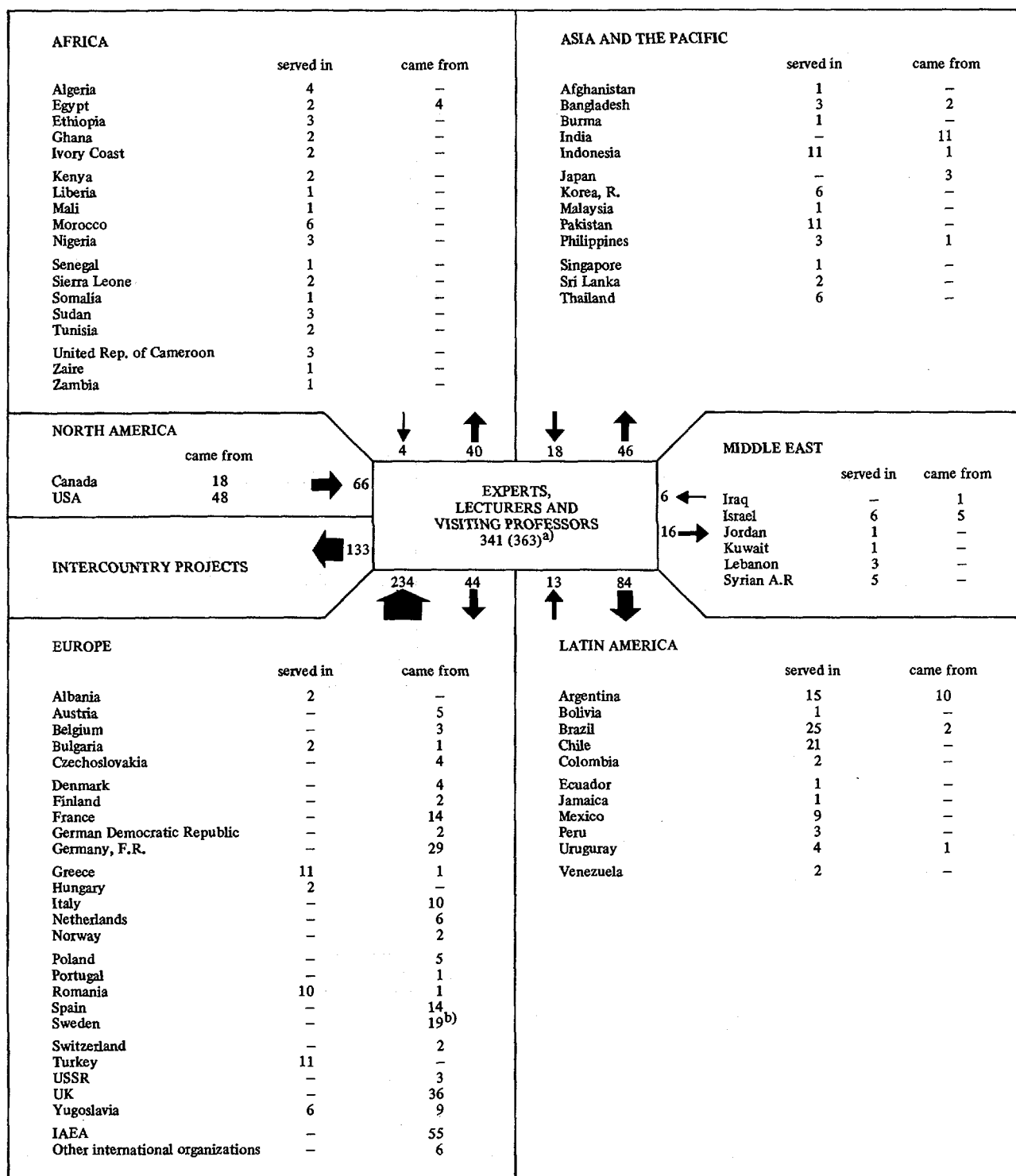
FIGURE 2A

DISTRIBUTION OF EXPERT SERVICES BY FIELD OF ACTIVITY: 1974 and 1975



Note: The figures in the columns above indicate the number of expert assignments and the corresponding percentage share, by field of activity, of the total expert services provided.

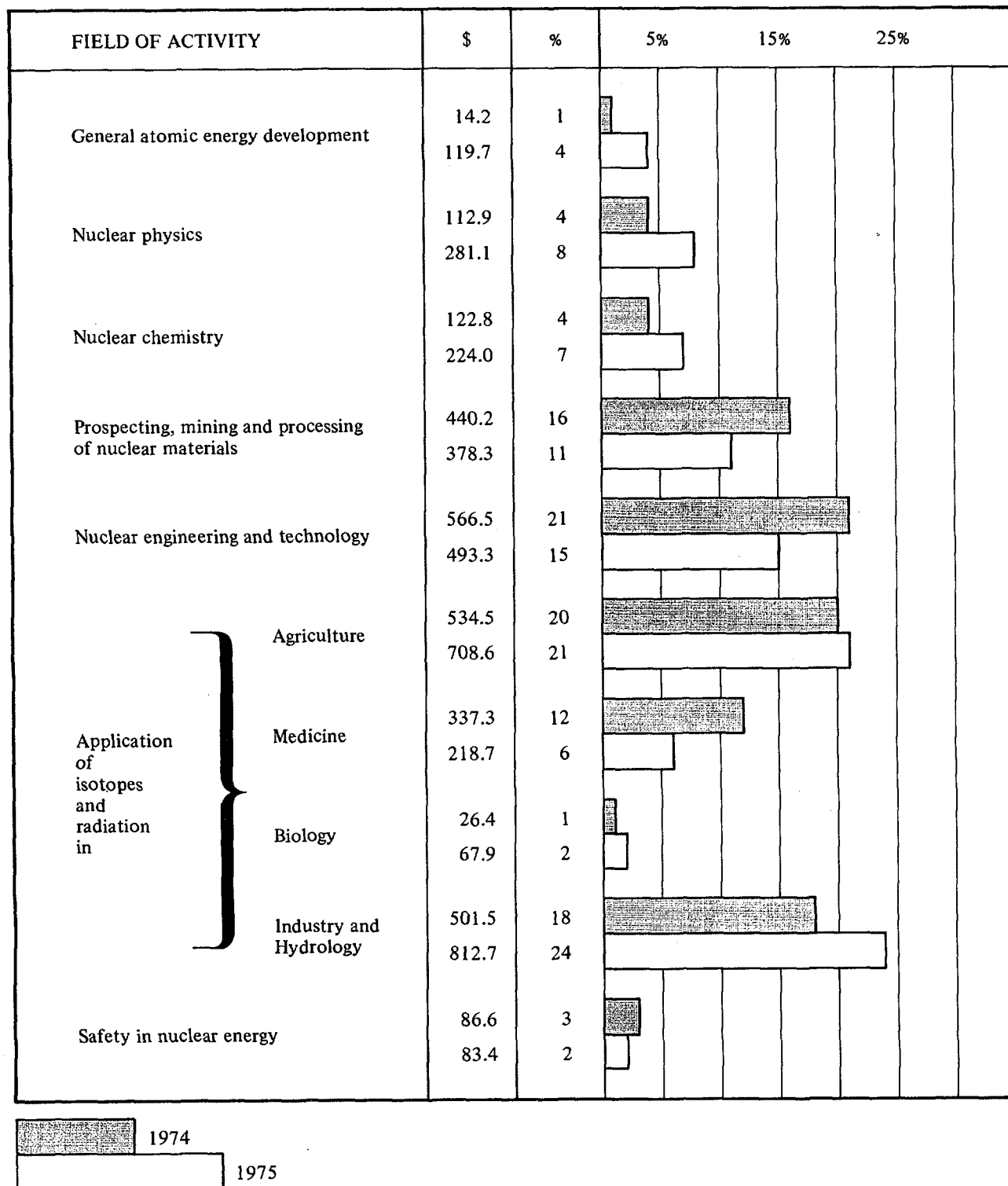
FIGURE 2B
DISTRIBUTION OF EXPERT SERVICES BY REGION: 1975



a) The difference between the number of assignments (363) and the actual number of experts (341) is due to the fact that each of 13 experts served in two, three in three and one in four different countries.

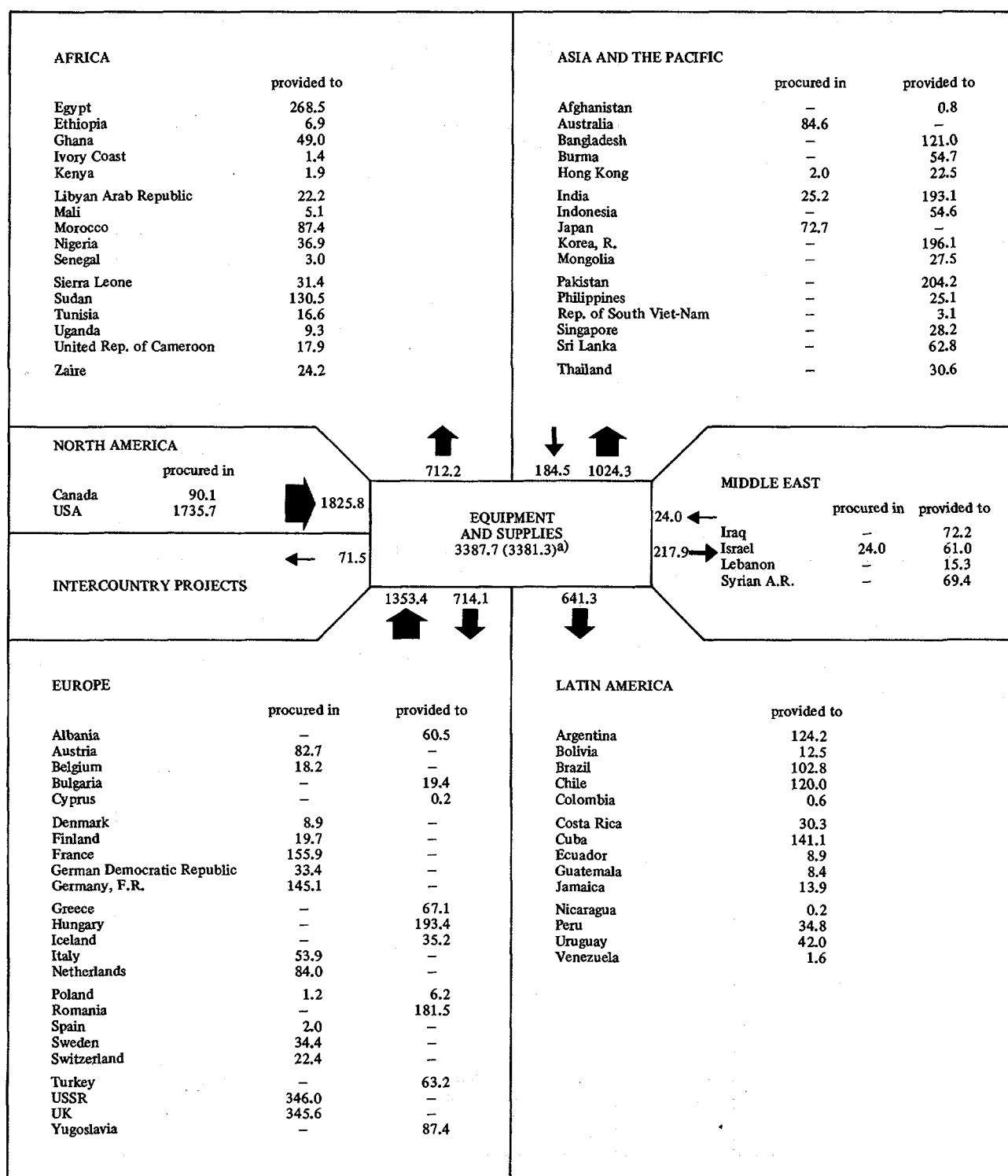
b) Includes one expert from India who served in connection with SIDA-financed country programme assistance, as well as eight lecturers for a SIDA-financed training course: from Australia, two; Austria, one; Canada, one; Germany, F.R., one; United Kingdom, one; Yugoslavia, one; IAEA, one.

FIGURE 3A
DISTRIBUTION OF EQUIPMENT BY FIELD OF ACTIVITY: 1974 and 1975
(in thousands of dollars)



NOTE: The figures in the second and third columns of the chart indicate the value (in thousands of dollars) of equipment and the corresponding percentage share, by field of activity, of the total equipment provided.

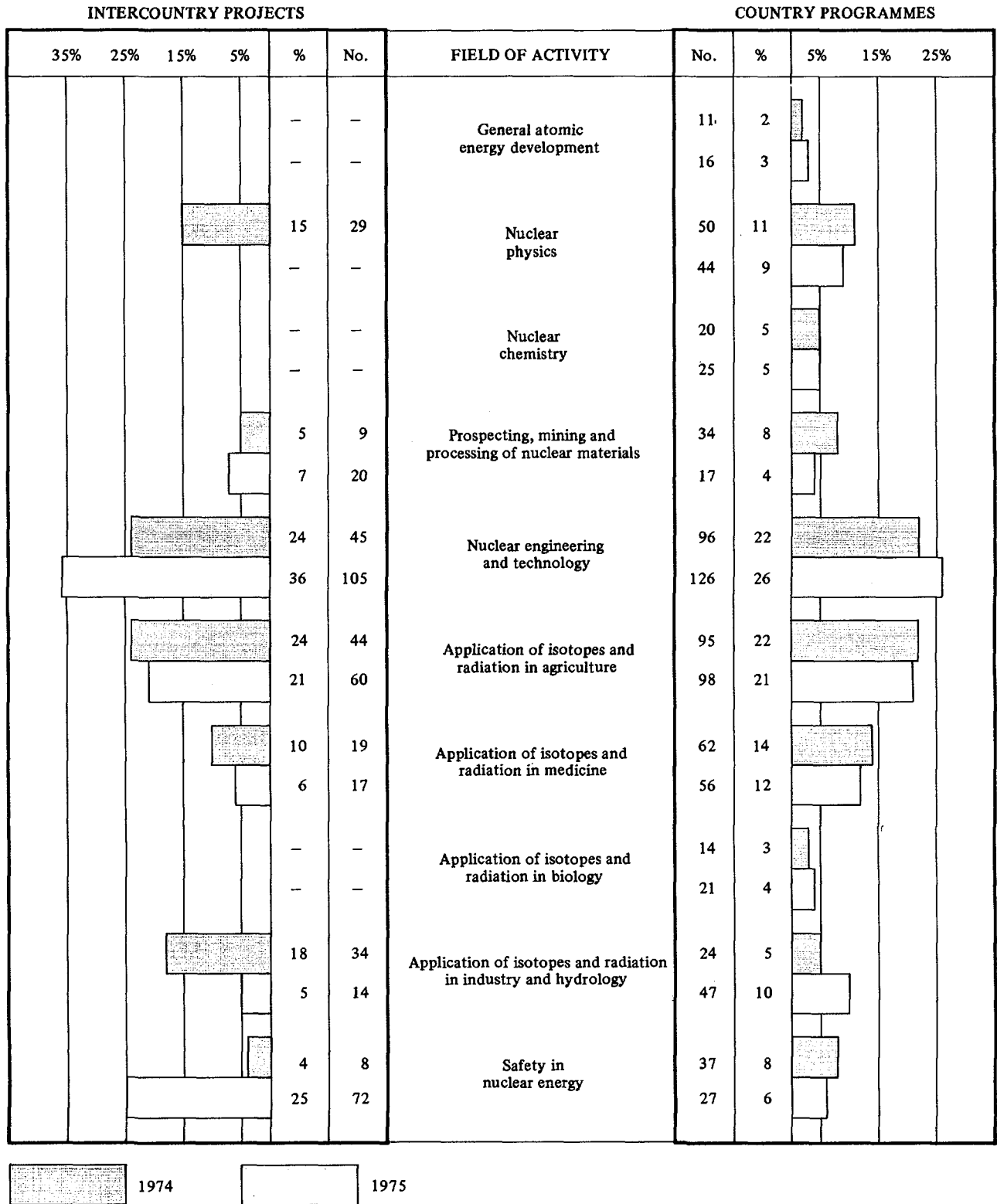
FIGURE 3B
DISTRIBUTION OF EQUIPMENT BY REGION: 1975
(in thousands of dollars)



a) Does not include miscellaneous charges amounting to \$6400.

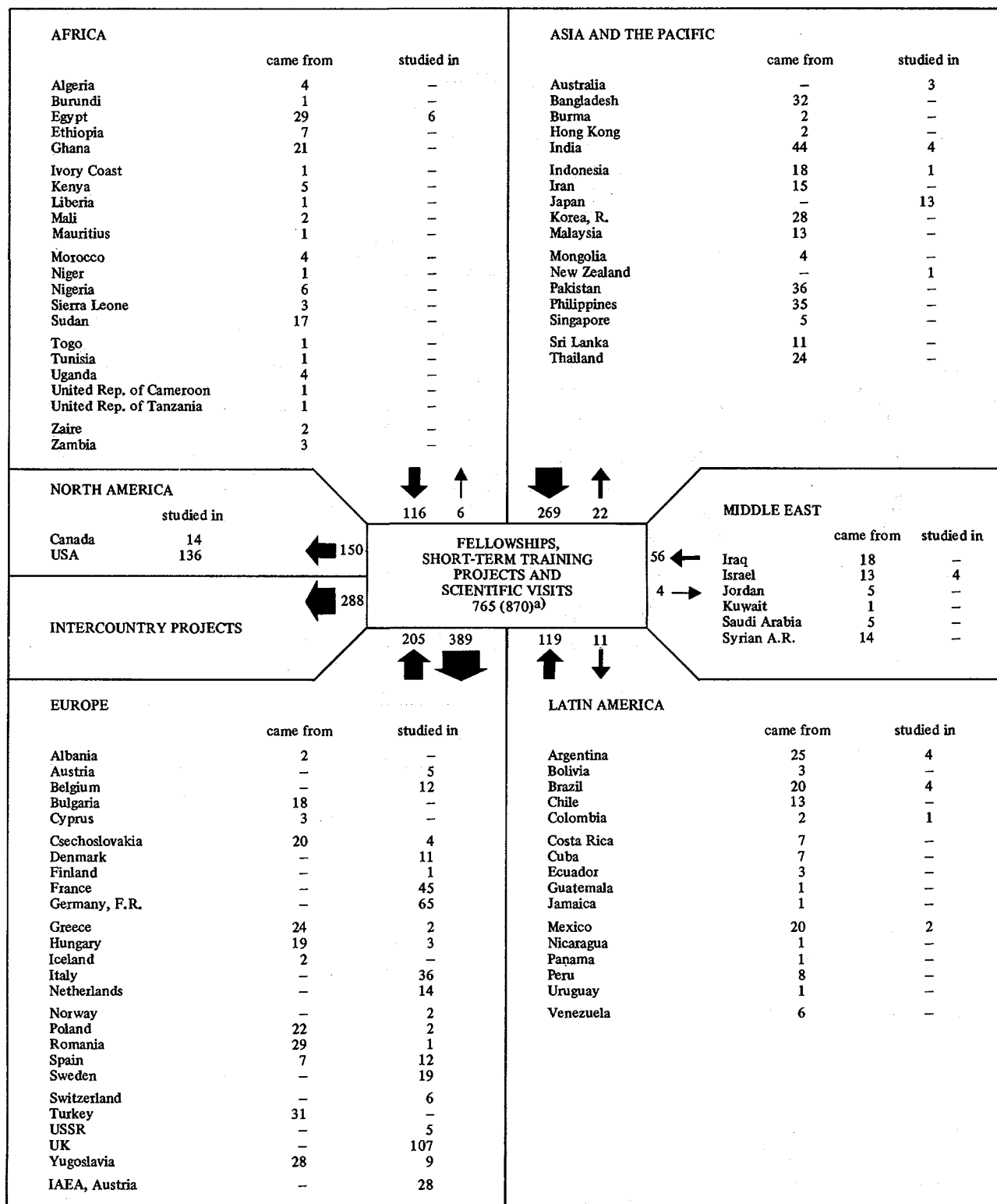
FIGURE 4A

DISTRIBUTION OF FELLOWSHIP AWARDS BY FIELD OF ACTIVITY: 1974 and 1975



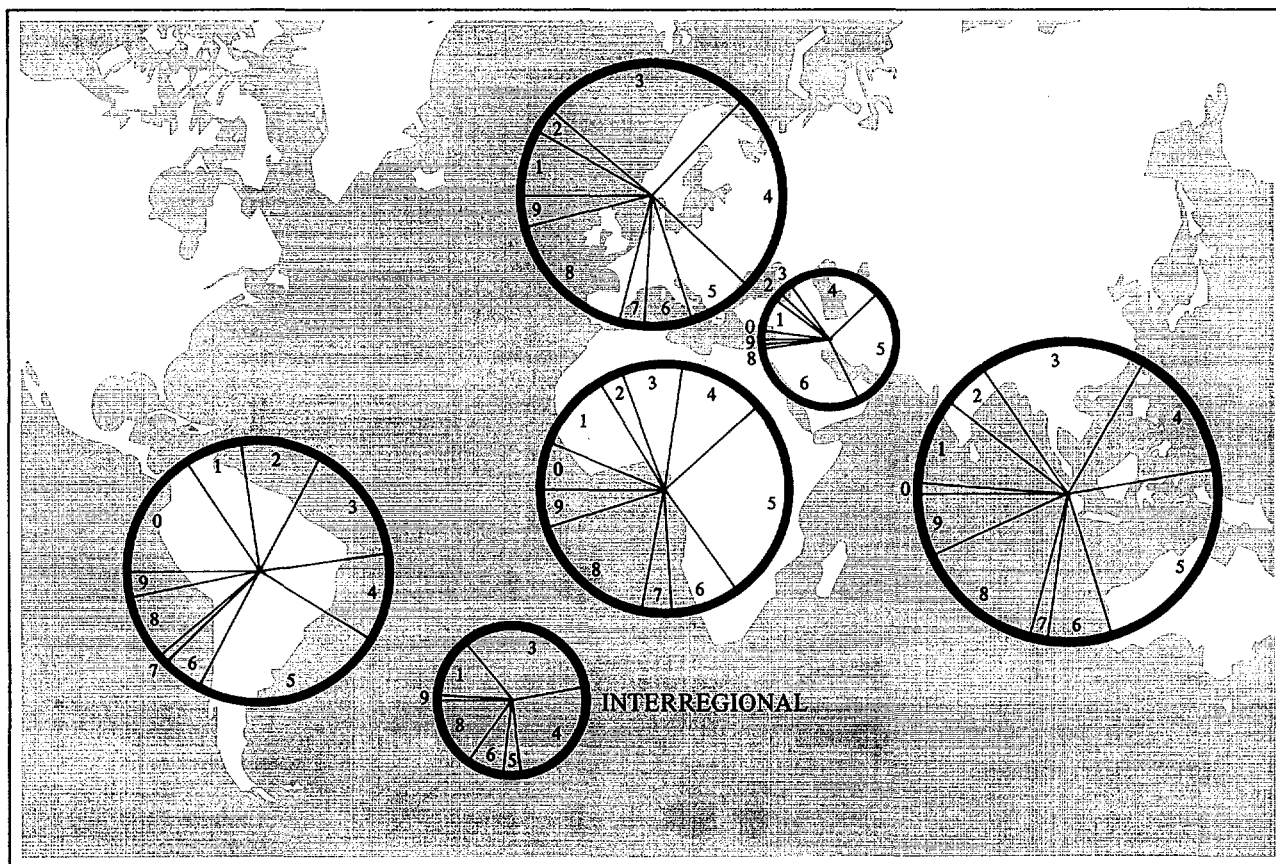
Note: The figures in the columns above indicate the number of fellowship awards and the corresponding percentage share, by field of activity, of the total number of fellowships awarded.

FIGURE 4B
DISTRIBUTION OF FELLOWSHIP AWARDS BY REGION: 1975



a) The difference between the number of awards (765) and the number of places of study (870) is due to the fact that 21 fellows studied in two; five in three, two in four and two in six different countries, whereas 11 holders of awards for scientific visits went to two, nine to three, seven to four and two to five different countries.

FIGURE 5A
DISTRIBUTION OF TECHNICAL ASSISTANCE BY FIELD AND REGION: 1975^{a/}
SUMMARY

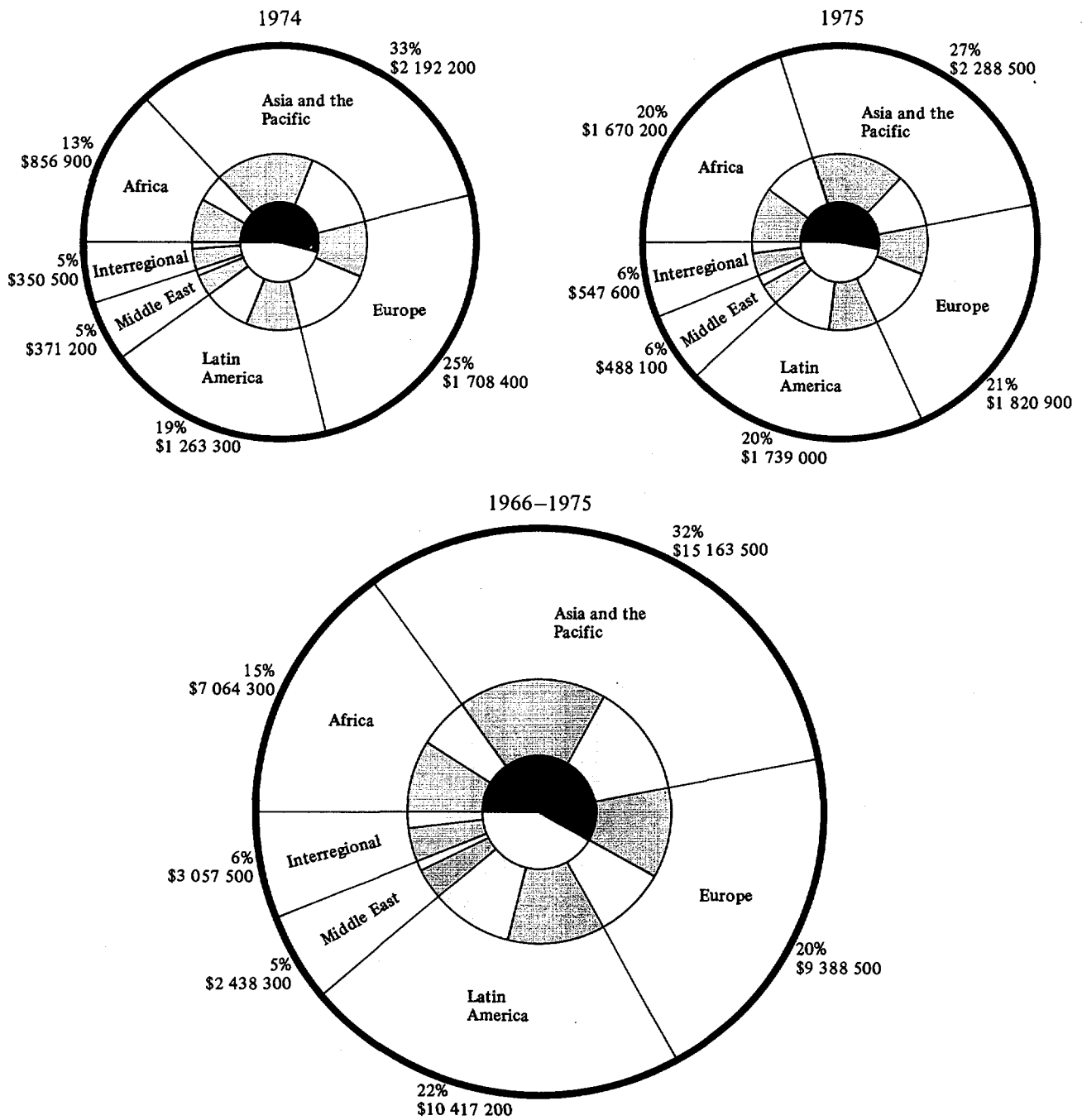


SUMMARY

Field of activity	Africa %	Asia and the Pacific %	Europe %	Latin America %	Middle East %	Inter- regional %	All regions %
0 - General atomic energy development	6	1	—	16	2	—	5
1 - Nuclear physics	10	9	8	7	8	1	8
2 - Nuclear chemistry	3	5	3	10	2	—	5
3 - Prospecting, mining and processing of nuclear materials	8	18	26	15	3	13	16
4 - Nuclear engineering and technology	11	14	25	11	23	33	17
Application of isotopes and radiation in	5 - Agriculture	27	23	8	24	30	21
	6 - Medicine	9	7	6	5	30	8
	7 - Biology	4	2	3	1	—	2
	8 - Industry and Hydrology	17	14	17	8	1	8
9 - Safety in nuclear energy	5	7	4	3	1	15	5
	100%	100%	100%	100%	100%	100%	100%

^{a/} For each region, the relative monetary value of the technical assistance provided by the Agency is denoted by the size of the circle superimposed over the region on the map. The size of the segments in each circle indicates the share of total assistance given in the various fields of activity.

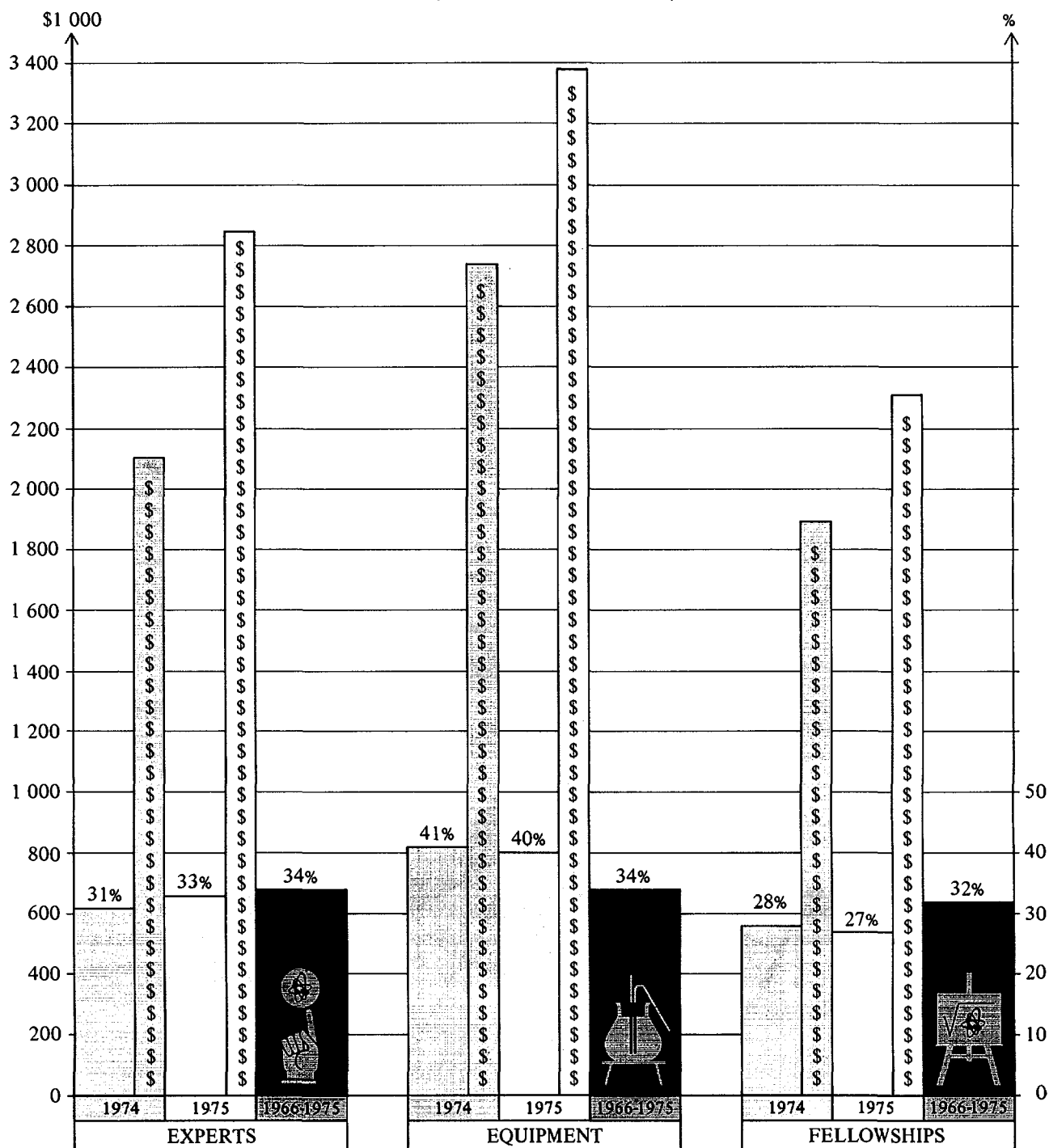
FIGURE 5B
DISTRIBUTION OF TECHNICAL ASSISTANCE BY REGION AND SOURCE
 (1974, 1975 and 1966-1975)



LEGEND (distribution of technical assistance by source):

INNER RING (regional distribution)	INNER CIRCLE (overall distribution)	1974	1975	1966-1975
Regular programme	Regular programme	53.8%	53.5%	58.4%
UNDP	UNDP	46.2%	46.5%	41.6%

FIGURE 6
DISTRIBUTION OF TECHNICAL ASSISTANCE BY TYPE OF ASSISTANCE
 (1974, 1975 and 1966-1975)



TYPE	1974		1975		1966-1975	
	%	\$1 000	%	\$1 000	%	\$1 000
EXPERTS	31	2 103.6	33	2 854.0	34	16 404.6
EQUIPMENT	41	2 742.9	40	3 387.7	34	16 094.9
FELLOWSHIPS	28	1 896.0	27	2 312.6	32	15 029.8
TOTAL	100	6 742.5	100	8 554.3	100	47 529.3

Note: Fellowships include participants in short-term training projects.

provided assistance in 1975 (23 in 1974). Twenty countries provided but did not receive technical assistance in 1975 (19 in 1974), and 52 countries were recipients only (51 in 1974). Thus 97 countries (93 in 1974) participated in the Agency's technical assistance programme in 1975. Figures 2B, 3B and 4B and Table 3 show the extent to which skills and knowledge were exchanged between countries.

3. By type of assistance

53. As shown in Fig. 6, the distribution of technical assistance in 1974, 1975 and over the period 1966-1975 by type, was as follows:

<u>Period</u>	<u>Experts</u>	<u>Equipment</u>	<u>Fellowships</u>
1974	31%	41%	28%
1975	33%	40%	27%
1966-1975	34%	34%	32%

The growing number of Agency-executed UNDP large-scale projects, which frequently have substantial equipment components, has accelerated the trend of allocating a gradually increasing share of funds for the provision of equipment. The average share of the total assistance provided that was devoted to equipment was 26% over the ten-year period 1962-1971, 30% over the period 1964-1973 and has now reached the 34% mark, which reflects an unprecedented growth rate of 2% per annum over the past four years.

(a) Experts, lecturers and visiting professors

54. In 1975, 341 experts, lecturers and visiting professors from 35 countries and six international organizations served a total of 844 man-months at a cost of \$2 854 000; the comparable data for 1974 are: 277 experts, lecturers and visiting professors from 36 countries and the Agency provided 786 man-months of assistance at a cost of \$2 103 600. In addition, unliquidated obligations and assistance in kind outstanding at 31 December 1975 totalled \$490 700 for expert services. Thirteen experts each served in two countries, three experts each served in three countries, one expert served in four countries and 191 experts were assigned to one country only. A total of 52 countries (54 in 1974) were provided with country programme experts and visiting professors, and an additional 133 experts and lecturers (67 in 1974) assisted 17 intercountry projects (53 partly cost-free and 27 cost-free experts and lecturers were provided, as compared with 24 partly cost-free and 30 cost-free experts and lecturers in 1974). Experts' final reports and similar reports which became available in 1975 are listed in Annex IV.

(b) Equipment and supplies

55. Including the value of grants of equipment delivered during 1975, 58 countries and seven intercountry projects (54 and eight respectively in 1974) were provided with equipment and supplies to a value of \$3 387 700, which represents an increase of almost one fourth over the amount of \$2 742 900 provided in 1974, and is the largest amount of equipment provided by the Agency in any one year. An additional amount of equipment and supplies valued at \$2 179 200 was still outstanding at the end of the year; this amount is included in the figures given in columns (9) and (10) of Tables 4, 7 and 8.

56. As in previous years, the need to spread the purchase of technical assistance equipment and supplies over a large number of Member States continued to be recognized. In 1975, those items were procured in 22 countries (in 1974, in 23 countries), as shown in Fig. 3B, which also includes financial data in respect of equipment grants.

(c) Fellowships

57. A total of 765 candidates from 70 countries received awards under the training programme in 1975 (see Fig. 4B and Tables 3 and 6) as against 631 candidates from 71 countries and a regional organization in 1974. The number of man-months of training awarded was 4200 in 1975 as against 3977 in 1974. The higher number of fellowship award holders in 1975 was due mainly to increases in the number of awards for participation in short-term training projects (288 awards in 1975 and 188 in 1974) and in the awards for individual study under Agency Type I and Type II fellowships (363 awards in 1975 and 338 in 1974).

58. Due to the large number of award holders under prior years' programmes who studied in 1975, the value of the training provided by the Agency in 1975 is the highest on record for any one year, namely, \$2 312 600, as compared with \$1 896 000 in 1974. The 1975 total does not include the unliquidated obligations and assistance in kind outstanding (Type II training not yet completed, or not yet begun) as at 31 December 1975, amounting to \$2 157 000. This amount is more than \$270 000 higher than the combined total of these two items at the end of 1974 and holds promise of a training programme amounting to about \$2 700 000 in 1976.

59. A comparison of the nominations and awards for country programme fellowships in 1974 and 1975 and of all technical assistance awards made during these two years is given below. The number of country programme awards rose by 6%, whereas the number of scientific visit awards and those for short-term training projects increased by 27% and 53% respectively.

<u>Country programme awards</u>	<u>1974</u>	<u>1975</u>
Nominations received	548	571
Effective awards [6]	413	439
Percentage of nominations which led to effective awards	75.4%	76.9%
<u>Inter-country programme awards</u>		
Scientific visits	30	38
Short-term training projects	188	288
Total awards	631	765

60. The increase from 75.4% in 1974 to 76.9% in 1975 in the percentage of nominations which led to effective awards is nominal and due primarily to the fact that the qualifications of candidates were similar in quality in 1974 and 1975. From the comparison given below, however, it can be seen that numerous candidates were not selected because they were under- or over-qualified for the training requested, their knowledge of the foreign language in which the training abroad would have been given was not satisfactory, the training requested was not related to the peaceful application of nuclear energy, or because their candidature was withdrawn and, thus, they were not available to take up fellowship awards.

[6] Total number of awards less withdrawals after award as at 31 December 1974 and 31 December 1975, respectively.

Nominations not resulting in effective awards in 1974 and 1975

	<u>Number</u>		<u>Share of total nominations received</u>	
	<u>1974</u>	<u>1975</u>	<u>1974</u>	<u>1975</u>
Not selected because the candidate lacked suitable qualifications or experience, or because the requested field of training was not in the Agency's area of competence	43	33	7.8%	5.8%
Withdrawn on the initiative of the nominating Government (before or after award)	53	63	9.7%	11.0%
Not resulting in an award owing to lack of funds or appropriate training openings	39	36	7.1%	6.3%
Total	<u>135</u>	<u>132</u>	<u>24.6%</u>	<u>23.1%</u>

(d) Regional and interregional activities

61. In 1975, the Agency conducted 17 intercountry training projects in 23 different countries, in which there were 468 participants from 61 different countries. The cost of attendance of 288 participants from 60 countries was paid out of project funds (cash and in-kind resources under the Agency's regular programme and under UNDP); the cost of attendance of 180 participants, including 170 nationals of host countries, was borne by another organization or programme or by the participant's Government. The statistical figures and financial tables in this report include short-term training project data only in respect of the 288 awards financed from Agency resources.

62. Six of the 17 intercountry training projects related to the application of isotopes and radiation (four in agriculture, one in industry and one in medicine); in addition there were four projects in nuclear safety, three projects in nuclear power development, one project in laboratory technicians' training, one project in the use and maintenance of nuclear and related electronic equipment, one in uranium geochemical prospecting methods, and one in neutron scattering. Further details on the location, attendance, financing, etc. of these projects are given in Annex III.

(e) Follow-up missions

63. In 1975 five one-man missions were sent to the regions to determine needs and discuss development plans with requesting countries; 16 countries were visited.

C. UNDP LARGE-SCALE ASSISTANCE ACTIVITIES

1. General

64. The modest "seed money" technical assistance of the regular programme type provided in small instalments over the years, to satisfy needs which Governments could not meet for lack of funds, has strengthened institutions in the recipient countries and enabled them to make a larger contribution towards economic and social development in their respective countries. In a growing number of cases these institutions are being selected to become the Government's counterpart organization to the Agency for the purpose of implementing

UNDP large-scale assistance to projects in the developing countries. Designed to make an early impact in the recipient country, this large-scale assistance provided through the Agency is primarily of the pre-investment type or is for the demonstration of nuclear techniques and modern technology, or involves a combination of both of these. Projects for which pre-investment assistance is provided through the Agency include power surveys as well as projects such as those involving the radiosterilization of medical supplies or the prospection for and evaluation of national nuclear raw materials resources. The latter projects also involve the demonstration of nuclear techniques and technology; examples of projects of this type for which the Agency has provided large-scale assistance are the nuclear research projects in agriculture in Brazil, India (completed in 1974), Indonesia, Morocco and in Yugoslavia (completed at the end of 1966), and the non-destructive testing centre in Argentina. The increasing importance of large-scale assistance in the overall technical co-operation activities of the Agency can be seen from the following comparison: ten years ago the large-scale assistance provided by the Agency totalled \$568 600 or less than 20% of the total assistance provided in 1966, as against \$2 696 000 or about 32% of the total assistance provided in 1975. Details are given below of the large-scale assistance currently being provided through the Agency with a view to bringing up to date the information provided in last year's report [7].

2. National centre for non-destructive testing and quality control in Argentina

65. Little assistance was provided to this project in 1975 due to organizational changes locally and in the internationally recruited staff made available by the Agency. In 1975 a general review was made of the project, which is expected to regain momentum in 1976.

3. Application of nuclear technology in agriculture in Brazil

66. Progress continues to be steady and the training programme is already making a positive contribution to the research programmes being carried out at the Centre of Nuclear Energy in Agriculture located at Piracicaba. Significant results have been obtained in the plant breeding programme where new bean (Phaseolus vulgaris) varieties will be ready for testing and multiplication in early 1976. Also, the discovery of a bean mutant resistant to Golden Mosaic, a disease considered a scourge throughout Latin America and which has become economically important only recently in Brazil, has created great interest; intensive testing of this mutant is now under way. In entomology, a survey programme on the sugar cane borer, Diatraea saccharalis, is producing information of importance for control measures. Studies in soil microbiology continue with work on nitrogen (N) fixation in beans and on non-symbiotic N-fixation in sugar cane. In the work in biochemistry emphasis is placed on studies on bean protein content and quality, while in plant pathology, work has been carried out on the identification of plant-infecting viruses. Research in the animal sciences is being concentrated on the nutrition of, and utilization of calcium and phosphorus sources in, ruminants. Recognition of the progress being made at the Centre, now part of the local School of Agriculture, is reflected in a proposal to convert it into a specialized institute of the University of the State of São Paulo. It is likely that additional UNDP large-scale assistance to the project will be approved, extending the duration of multilateral aid to 1980 during a second phase. The Danish International Development Agency (DANIDA) has recently approved the Brazilian Government's request for 12 man-months each of expert services and fellowship training in the use of isotopes in environmental chemistry, as an integral part of the project.

4. Technological applications of nuclear energy in Chile

67. Implementation of the project is progressing to the satisfaction of all concerned. In 1975 minor revisions were made in the project's objectives and work plan, resulting in a

[7] GC(XIX)/INF/154, paras 68-85, which also include information on the objectives of the projects being assisted.

rephrasing of activities to the end of 1976. Work is being done in the following areas: reactor operation and nuclear technology; the production of radioisotopes for use in agriculture, industry and other research areas; the production of radiopharmaceuticals for medical therapy and research; radiochemistry, for activation analysis; work with labelled fertilizers; food preservation studies; radiological protection and dosimetry; and environmental monitoring. During the first half of the year the experts recruited by the Agency carried out a training programme on the various applications of nuclear energy.

5. Uranium prospecting in Chile

68. The project is designed to help establish a national radioactive resources plan through the training of personnel in all modern uranium exploration techniques. This work will ultimately be directed to discovering and developing the technical and economic potential of the uranium ore deposits within the country. Seven areas covering 24 200 km² have been designated for the reconnaissance survey. Preliminary training of Chilean personnel was provided in aerial and terrestrial radiometric survey methods and in geochemical prospecting techniques under bilateral arrangements. During the second half of 1975 a number of Agency-recruited experts, including the project manager, took up their duties and equipment procurement was initiated.

6. Radiation dosimetry after accidents in Egypt

69. The expert recruited by the Agency, who was scheduled to join the project in 1975, withdrew at the last moment, making it necessary to find new candidates. The replacement is expected to take up his duties during the first half of 1976.

7. National Centre for Radiation Technology in Egypt

70. The training abroad of counterpart staff commenced in 1975, as planned, and the project manager recruited by the Agency joined the project in January 1976.

8. Exploration for uranium in Central and Eastern Macedonia and Thrace (Phase II) in Greece

71. The training of counterpart staff continues to be an important activity, and test drilling has already commenced.

9. Irradiation sterilization of medical products in Hungary

72. Construction of the building to house the cobalt-60 facility was completed at the end of 1975, and the commissioning of the plant is scheduled to take place early in 1977.

10. Demonstration plant for the irradiation sterilization of medical products in India

73. The irradiation sterilization plant, ISOMED, was commissioned in January 1974, and UNDP assistance to the project was completed in 1975. The project has satisfactorily met its objective of establishing a practical demonstration facility for sterilizing medical products such as cotton dressings, surgical sutures, disposable hypodermic syringes, fluid administration sets, etc. as a service to the country's medical products manufacturing industries. The training received by the Indian scientific and technical personnel during the construction and commissioning of this plant has provided the know-how required for the design, operation and management of large radiation sterilization plants needed in other parts of the country. ISOMED is at present utilized at about 35% of its installed capacity and, with the introduction of new products, a gradual increase in the utilization of the capacity is foreseen. ISOMED has already served as a centre for the training of scientists and engineers from a number of developing countries of the region in various aspects of radiation sterilization and as a source of expertise in that subject.

11. Mutation breeding in Indonesia

74. The purpose of the project is to improve crop yields. As a first priority lowland and upland rice varieties were selected, to try to improve their production per hectare, protein value, disease resistance and response to fertilizers, and to shorten the time for crop maturity. As a next step, wheat improvement is sought in terms of higher yield potential, shorter stalks, and adaptation to low altitudes. Grain legumes (for example, soybeans and ground nuts), which constitute the country's principal source of plant protein, also offer distinct possibilities for improvement, as does sugar cane, with regard to yield, drought and disease resistance. Good progress has been made so far. The production of early maturing mutants and also improvements in the protein content in some varieties are obviously significant supplements to the results obtained from conventional breeding programmes in rice in Indonesia. The successful performance of some of the early maturing mutants in yield trials are very encouraging and, as soon as the required official testing by the Ministry of Agriculture has been completed, the release of a new rice variety developed by the counterpart organization is anticipated. The work on other crops (soybeans, sugar cane and rubber) is also well established and will be intensified in 1976.

12. Radiation processing demonstration facility in the Republic of Korea

75. In August-September 1975 the cobalt-60 irradiator and the 300 keV electron accelerator were installed, and the radiosterilization of medical products commenced in November.

13. Use of radioisotopes in agriculture in Morocco

76. The Agency's contribution consists mainly of providing advice on research programmes such as fertilizer utilization studies, as well as providing the counterpart staff with in-service training and opportunity for study abroad.

14. Training and research in applied nuclear physics at the Faculty of Sciences (Rabat) in Morocco

77. In 1975 a full-time adviser to the Faculty of Sciences and a number of consultants were assigned to the project, and fellowship training abroad was begun.

15. Insecticidal investigation for tsetse fly eradication in Nigeria

78. The Agency's expert joined the project in 1975, and satisfactory progress has been made.

16. Exploration for uranium in the Siwalik Sandstones, Dera Ghazi Khan District (Phase II) in Pakistan

79. Reconnaissance of the project area has been completed, and emphasis is now being placed on the search for and the evaluation of uranium ore bodies and the training of staff.

17. Development of nuclear technology in Romania

80. Construction of the buildings for the new institute at Pitesti-Colibasi is progressing, and the first units were moved into the new premises at the end of 1975.

18. Exploration for uranium in South-West Anatolia in Turkey

81. Test drilling and geochemical surveying are under way.

19. Radiation unit for the industrial application of ionizing radiation in Yugoslavia

82. The purpose of the project is to construct and establish a demonstration facility for the radiation sterilization of disposable medical supplies and other related items as a service to local hospitals to improve health standards. The counterpart organization will also engage in research leading to the introduction of radiation technology and processing in industry for the improvement of polymers and plastics, using the same cobalt source as will be installed for radiosterilization work. A subcontract for equipping the irradiation plant has been awarded and the plans for the construction of the plant have been finalized.

20. Radioisotope applications in Zambia

83. The main objective of the project was the establishment of a radioisotope advisory service capable of assisting local research organizations in carrying out scientific investigations in a number of fields related to Zambia's development and of training local staff in the use of radioisotope equipment. Assistance to the project was completed in 1975, and the Radioisotope Unit of the National Council for Scientific Research is now able to function as originally planned.

D. SIDA LARGE-SCALE ASSISTANCE ACTIVITIES

1. General

84. On 19 December 1969 the Agency signed an agreement with the Government of Sweden governing the manner in which the two parties would co-operate in the provision of technical assistance to developing countries. Furthermore, the Government of Sweden agreed to make funds available to the Agency - through the Swedish International Development Authority (SIDA) - for the implementation of mutually agreed programmes and projects [8]. In the interim the Agency has conducted eight training courses and arranged study programmes for the holders of 64 Type II fellowship awards which were financed by SIDA. In addition to providing opportunity for participation in training courses and for individual study abroad, SIDA also finances the provision of experts and equipment to certain countries and allocates the resources therefor on the basis of an "indicative planning figure", along the lines adopted by UNDP. Thus, ministries in the eligible countries submit requests for assistance through the national co-ordinating authority to SIDA, which arranges for a United Nations organization to serve as the executing agency for the assistance which has been approved. In 1974 the first case of SIDA large-scale assistance - to be provided through the Agency - was approved.

2. Development of the Institute of Nuclear Agriculture in Bangladesh

85. The purpose of the project is to enable the Government to establish a new laboratory at Mymensingh and initiate applied research, in co-operation with the other agricultural research and extension organizations in the country, and to provide guidance on the most effective use of the available resources to meet the agricultural production targets foreseen in the current five-year plan. SIDA assistance, valued at \$1.3 million, involves the provision of 68 man-months of expert services and 300 man-months of training abroad for the counterpart staff over a five-year period. The construction of the Institute, as well as the installation of laboratory equipment is progressing satisfactorily, and the project co-director provided by the Agency took up his duties in December 1975.

[8] The text of the agreement is reproduced in document INFCIRC/138.

E. EVALUATION OF TECHNICAL ASSISTANCE PROGRAMMES

1. General

86. In accordance with the principles governing the provision of technical assistance, the Agency provides such assistance to States or a group of States only in agreement with the Governments and on the basis of requests received from them. The assistance is given only to or through Governments and is provided as far as possible in the form which the State or group of States desires. The implication of these principles is, therefore, that the evaluation of the assistance received is basically a governmental obligation and, as stated in the Consensus of the UNDP Governing Council, "Evaluation carried out within the United Nations system of UNDP-assisted activities will only be made with the agreement of the Government concerned. This will be carried out jointly by the Government, UNDP, the United Nations agency concerned and, where appropriate, the executing agent outside the United Nations system".[9] The detailed evaluation procedures utilized within the Agency in respect of the programmes supported from its own resources and by UNDP were described in this report two years ago.[10] These procedures were applied throughout 1975 and have been kept consonant with the limited resources available.

87. It is to be noted that the duration of expert assignments is tending to become shorter and the expert component in several projects consists of recurrent short visits by high-level consultants, which are arranged to take place at predetermined stages of a project's work programme. An interesting innovation in the scheduling of expert services is the assignment of a high-level consultant, for short periods, together with a junior, associate expert who remains at the project site during the entire period during which assistance is provided and thereby strengthens the local capability to carry out the consultant's recommendations in the intervals between his visits. The Agency has one such team in the field now, and it is anticipated that there may be two or three during 1976. The short-term expert or consultant is thus able, during the course of the Agency's assistance, to monitor and influence the progress of the project; furthermore, through his reports and briefing visits to Headquarters, the Agency is able to fulfil its function of assessing the likely impact of its assistance.

88. Several experts have commented on the desirability of implementing projects involving the provision of six or more man-months of expert services in two stages, namely, by making a short visit initially to ascertain the adequacy of the available counterpart facilities (including the personnel and supporting equipment), followed by the main, longer-term assignment once the project has been well prepared. In one case, the use of this method could have prevented the non-utilization of some expensive equipment provided by the Agency due to the dearth of trained personnel; in fact, the expert had to spend much of his time training the counterpart staff at a relatively low technical level. In another country, where the implementation of the proposed work programme was delayed for several years after the assistance to the project had been approved, the Agency's assistance to the project would have been more effective had the expert's six months' assignment been changed to a series of two or three short missions of up to two months' duration each. A preliminary visit by the expert would clearly have been desirable, and his advice at an early stage would have helped to prepare the project and reduced the delay in its implementation. On the other hand, some experts are still needed for assignments of one year or more in duration, and an expert who served in one country for four years has commented that experts on long-term assignments should be given terms of reference as wide as practicable since this enables them to provide advice on all aspects of a given work programme and leave behind an adequate foundation of ideas for the local staff to build upon. It also needs to be reiterated that, as the assessment of the effectiveness of Agency assistance cannot be appropriately

[9] Paragraph 50 of the Annex to the decision of the UNDP Governing Council; see para. 94, ECOSOC document E/4884/Rev.1.

[10] GC(XVIII)/INF/148, paras 85-92.

carried out in isolation, bearing in mind the inter-sectoral implications of most Agency-assisted projects, such an assessment will make it necessary to take a broad look at the entire development effort of the assisted Government. This is particularly the case, for example, in providing assistance in connection with power planning, mineral resources development and the strengthening of educational infrastructures.

89. The necessity of having qualified counterpart support personnel for research programmes was demonstrated in many countries. In one programme where an expert had spent several years assisting in the equipping of a central laboratory, it had been planned to send a counterpart abroad for university degree work but, since the limited scope and number of research programmes carried out did not make it necessary to upgrade the counterpart's professional qualifications, it was decided to concentrate on the in-service training of laboratory technicians to the senior level instead. Elsewhere, the need for an electronics workshop with repair and maintenance facilities has been identified and is being met by the provision of expert services under multi- and bilateral arrangements; some of the necessary training is being provided on the job, some at the interregional training courses held yearly by the Agency, and a potential for organizing group training of this kind on a regional basis has also been identified.

90. Since the basic aim of technical assistance is the transfer of technology and know-how, the existence of qualified counterparts in the recipient Government is essential. In the early days of technical assistance in the United Nations system it was the practice to ask the recipient Government to designate a counterpart who would work with and take over from the expert on the completion of the latter's assignment; subsequently, this concept was found to be unreliable because the counterpart did not always remain with the project long enough to take over and continue the work upon the expert's departure. The emphasis is now on the development of staff capability in a collective sense, thus enabling the project staff provided by the Government and by the Agency to work as a team. This has the obvious advantage of lessening the dependence of projects or institutions on individuals, who may be transferred after their in-service training, and reduces the need for an individual to carry out his tasks without support services from others.

91. Looked at in this light, the adequacy of counterpart availability varies from country to country and often between projects in the same country; in general, the larger the project, the better the counterpart support. When counterpart support involves building construction, this is usually budgeted for and provided. If that support should consist of the provision of laboratory equipment, for example, the results are not always satisfactory; furthermore, there is too often a failure to provide funds for the recurrent expenditures involving foreign currency, for example, for spare parts and expendable supplies not obtainable locally.

92. Experts have stated that they have found counterpart work programmes adequate, although other field staff have recently commented on a lack of specific and thoroughly planned work programmes, while another expert mentioned the lack of enthusiasm and the lax attitude of the local technicians towards routine analytical as well as more demanding research work. It is hoped to remedy this situation by better project design and also by sending experts on short-term missions prior to the implementation of Agency assistance in those cases where there is uncertainty as to the adequacy of trained staff and supporting equipment. Generally speaking, counterpart staff support is more effective when that staff has received training under the Agency's fellowship and training programme prior to the commencement of the expert's main assignment.

93. Frequent reference has been made in previous reports to the utilization of regular programme funds as seed money for large-scale assistance of longer duration, financed under UNDP, to projects in the developing countries. This use of regular programme funds has been yielding good results for many years already, and the increasing number of these large-scale assistance projects is largely due to experts who were initially assigned to a country under the regular programme for varying periods, for example, in Morocco, where the impetus to two large-scale UNDP projects [11] was given by Agency experts on

[11] See paras 76 and 77 above.

long-term assignments, one to the Directorate of Agricultural Research and the other to the University of Rabat. Other projects concerned with natural resources development in Ethiopia, improving grassland research in Nigeria, strengthening the scientific and technical infrastructure in Zaire, and raw materials development in Morocco, were first assisted by regular programme experts, and these projects are now expected to receive large-scale aid within the framework of UNDP country programmes for 1977-1981. Large-scale UNDP assistance to projects for the development of nuclear raw materials in Indonesia, the Philippines and Thailand is also expected to materialize in the near future as a result of the advice and findings of regular programme experts. Another country is proposing to use a considerable share of its UNDP indicative planning figure (IPF) for the second IPF cycle, 1977-1981, for projects involving the use of nuclear technology. The scope and structure of assistance requests in this area are very comprehensive due to the advice of an Agency expert who was initially sent to the country for two months, but whose assignment is now being extended for another year in order to draw up the necessary assistance requests, taking into account the investment needed to carry out the country's nuclear energy plans for developing and utilizing nuclear technology. The above examples reflect the contribution which the Agency's regular programme experts have made and continue to make in assisting the recipient countries in their planning for the introduction or the expansion of the use of nuclear technology, the practical applications of which are growing in importance in the developing countries.

2. Fellowship training survey

94. The purpose of the fellowship training surveys is to evaluate the effectiveness of the training provided by the Agency. This is done on a routine basis: a printed form ("Fellow's Report on Training Programme") is sent to each fellow approximately three months following the completion of his studies; the returned forms are analysed as part of the survey; to those fellows who failed to return the form, a shorter questionnaire is sent. Both forms are designed to obtain the following information:

- (a) Did the fellow return to his home country? (If not, why not?);
- (b) Did he receive an academic degree or diploma as a result of his fellowship?;
- (c) Did he publish research results or a technical paper?; and
- (d) How is the fellow's present work related to his fellowship training?

95. The current survey, the fifth in a series, is concerned with the information received from fellows who completed their training during 1972 and 1973. There were 519 fellows from 62 countries who completed fellowships during this time; 460 or about 89% of them returned the forms to the Agency. (Since the inception of the training surveys, 3092 forms have been returned out of a total of 3645 sent, which constitutes an unexpectedly high return of 85%.)

96. The results of the current survey and the consolidated data resulting from the first five surveys are as follows:

97. The current survey shows that an extremely high percentage of fellows (98%) returned to their home countries; of the ten who did not return, six remained abroad to complete their studies (to obtain a degree), three intend to remain abroad permanently, and one went to another developing country as an "assistant visiting professor".

	Current survey		Surveys 1-5	
	Number	Percentage	Number	Percentage
Fellows who returned home	450	98.0	2946	95.3
Fellows who remained abroad	10	2.0	146	4.7
to complete studies	6	1.2	100	3.2
permanently	3	0.6	45	1.4
temporarily, to teach	1	0.2	1	0.1
Fellows who received post-graduate degree	48	10.4	<u>a/</u>	<u>a/</u>
Fellows who published papers	206	44.8	<u>a/</u>	<u>a/</u>
Of fellows who returned home, relationship of present work to fellowship training:				
closely related	369	82.0	2490	84.5
partially related	57	12.7	334	11.3
not related	24	5.3	122	4.2

a/ Complete data are not available.

98. Although fellowships are not granted for the primary purpose of obtaining a higher degree, approximately one out of ten fellows surveyed was able to achieve a doctorate (23 fellows), Master of Science degree (19), "Licence" or similar academic award (6) as the result of the training. Moreover, nearly every second fellow had one or more papers published dealing with the results of his fellowship studies.

99. Most significant in each survey, of course, are the findings regarding the relevance of a fellow's training to his subsequent work. Again most of the fellows (82%) reported that their work is "closely related" to the training received. Of those who rated their jobs as only "partially related" (one out of eight), several commented that this was due to the lack of proper equipment, or that they expected their work in the future to be more closely related to the training received. Among the 24 fellows whose reply was categorized as "work not related", five, for example, indicated that their work was remotely related to their fellowship studies, one fellow was undergoing military service, and one did not reply to the question; nine fellows expected that their future work would be closely related to the training received and four stated that the lack of equipment was the reason why their training was not being utilized (three of these four fellows stated that the establishment of an isotope laboratory was planned and, when it was ready, their training would be put to use).

100. The high percentage of questionnaires returned in respect of the current survey (88.6%) assures the credibility of the extrapolation of the results. It can safely be said, therefore, that the Agency's fellowship programme is continuing to provide very effective training for engineers, scientists and technicians from the recipient countries.

Part III. TRENDS AND CONCLUSIONS

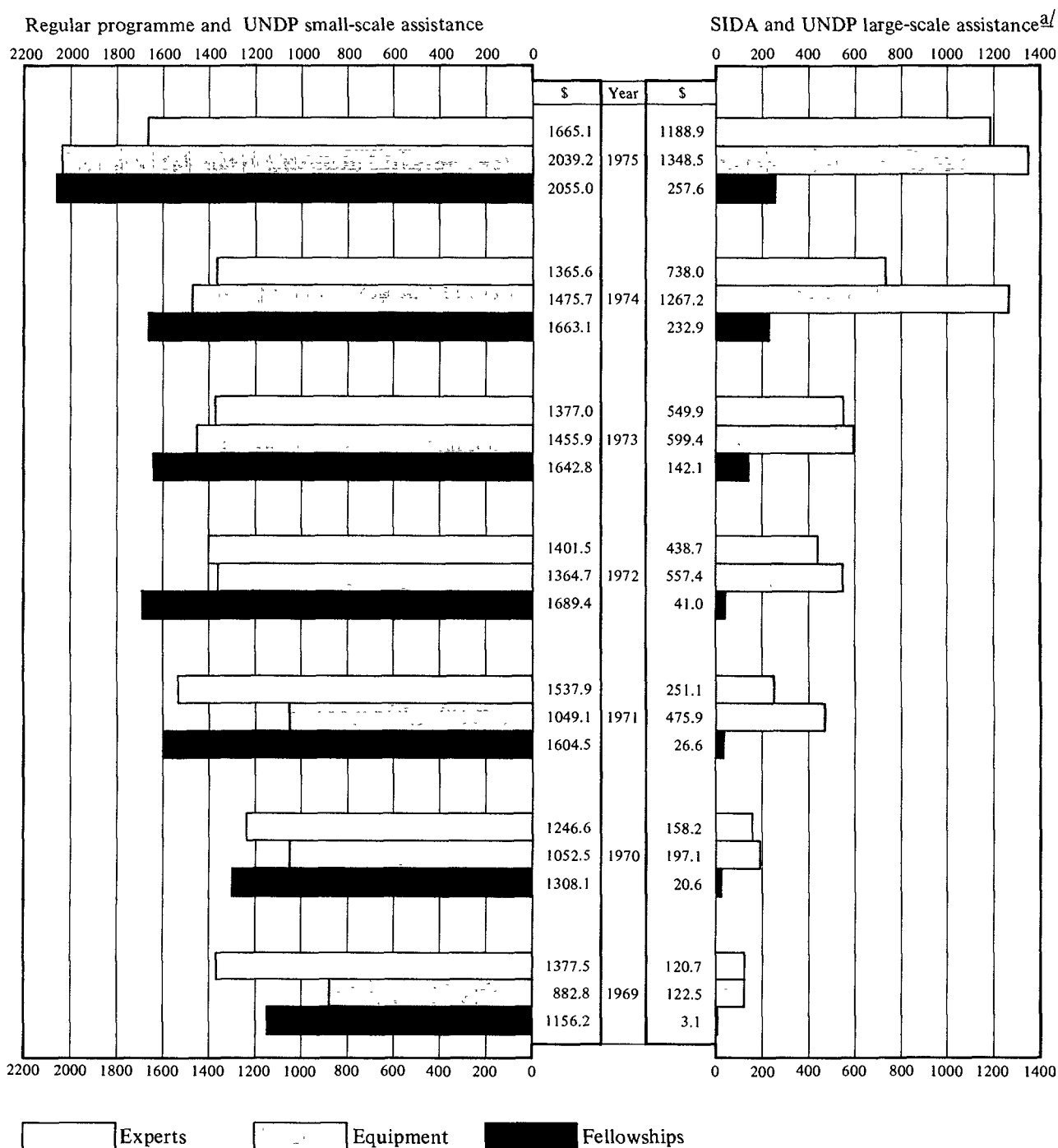
101. The application of isotopes and radiation in agriculture continues to utilize at least 20% of Agency resources each year. The expansion of agricultural production requires a sound research capability and the emphasis being placed on the introduction and utilization of nuclear techniques - in conjunction with traditional methodologies - reflects a recognition of the need to strengthen government services in this area. It is to be expected that the use of nuclear techniques in agriculture will continue to be a priority field in which assistance is requested from the Agency.

102. As in 1974, the other three areas which were among the four fields in which the most Agency assistance was provided, are: (i) nuclear power, (ii) the exploration for, and the development of, nuclear raw materials, and (iii) the application of isotopes and radiation in industry and hydrology. A major priority item in the future will be the need to provide assistance in connection with the manpower surveys which will be required for the planning of staffing requirements for nuclear power infrastructures. Simultaneously, there is a need to train an increasing number of middle- and lower-grade technicians to provide the necessary support services in all areas. As mentioned in paragraphs 18-23 above, 1975 was the first year in which a special training programme devoted to the introduction of nuclear power was initiated, and it is anticipated that increasing resources will have to be used for this activity in the years ahead. The widespread introduction of nuclear power in the developing countries will also require the application of safeguards; therefore, the provision of training in the use of safeguards procedures will figure in the Agency's technical assistance programme in the future.

103. Largely reflecting the changing needs of the developing countries, their relationship with the industrialized countries in respect of development aid is in a state of transition. In order to meet the requirements of this situation, most donor agencies or programmes have considered and are introducing "new dimensions" of assistance; this policy shift was made to increase flexibility in the formulation of requests for, and implementation of, the available assistance. The changes introduced include the appointment of national project managers as the executing agency's on-site leader, increased responsibility on the part of national project directors when the activities under their charge are receiving multilateral assistance, and the possibility of making more extensive use of local facilities and services. Whilst maintaining the basic principles established for the purpose, it is to be expected that some changes in the procedures governing the provision of technical assistance by the Agency will be introduced which could lead, for example, to longer-term assistance under the regular programme. In addition, new forms of training for groups, on a national, in-service basis, as well as at regional and multi-regional courses - some of which may be of longer duration than was previously the case - may be required. Also, a more frequent use of advisory services for project formulation and implementation seems desirable.

104. It is to be noted that the use of regular programme assistance as seed money continues and results in an increasing number of projects that attract large-scale UNDP support over longer periods. This use of the regular programme will be even more important in the future in view of UNDP's liquidity problems and the need to cut back UNDP assistance by at least 20% in 1976. To fill the gap created by the lack of UNDP funds and to offset inflation, an increase in Agency resources will be required to make it possible to maintain the necessary momentum of the nuclear power programmes of many developing countries, as well as for the expansion of the use of nuclear technology in different development processes. In the financial context, the Agency should continue its efforts to convince the developing countries with a considerable surplus balance of payments to make greater use of self-financing procedures such as funds-in-trust and cost-sharing in respect of the technical assistance they request from the Agency.

FIGURE 7
TRENDS IN THE TECHNICAL CO-OPERATION ACTIVITIES OF THE AGENCY
(in thousands of dollars)



^{a/} The UNDP large-scale assistance figures given above in respect of experts and equipment include expenditures on subcontracts and miscellaneous project costs; these amounted to \$70 500 in 1969, \$1100 in 1970, \$35 100 in 1971, \$203 800 in 1972, \$196 800 in 1973, \$227 800 in 1974 and \$539 500 in 1975.

ANNEX I

STATISTICAL TABLES

Introductory Notes

Resources

1. Figure 1A and Table 1 show the resources made available for approved field programmes of technical assistance and thus do not include UNDP overhead cost allocations. In addition, data in respect of offers of assistance in kind have been up-dated to 31 December 1975; for example, the value of Type II fellowship offers has been adjusted, where necessary, to reflect the resources that were actually available when fellows took up their studies under Type II arrangements. The estimated value of all offers of assistance in kind in support of a given year's technical assistance programme is shown in columns (1b) and (2b) of Table 1.
2. All monetary values appearing under the heading "in kind" are estimated in accordance with the following guidelines:
 - (a) Experts. The value of the services of each cost-free expert is estimated on the basis of the average salary of an equivalent expert engaged by the Agency and the applicable daily subsistence allowance as established by UNDP, plus the cost of a round-trip air ticket; analogous criteria are used in estimating the value of the services of cost-free and partly cost-free lecturers;
 - (b) Equipment. The value of equipment is estimated according to the offer made by the donor Government (at the later, "assistance provided" stage, however, the value to the relevant project is based on the actual costs incurred by the donor Government); and
 - (c) Fellowships. The value of Type II fellowships is estimated on the basis of the monthly stipend rate either as proposed by the host country or as established currently by UNDP, multiplied by the duration of the award in months. The estimated travel costs have been added if they were paid by the host country. (Training course stipends paid under this heading, however, are based on actual payments.)

These values and the totals in which they are included must therefore be considered as approximations.

Assistance provided

3. The financial statistics given in Tables 4, 7 and 8 relate, in the first instance, to actual cash payments against 1975 and prior years' obligations (shown according to the year(s) in which the cash payments were made) plus the total value of the assistance made available in kind (shown according to the year(s) in which it was provided). Thus, the balance of funds - for example, obligated but not spent in 1975 - is not included in the financial data relating to the assistance provided, but is shown separately in column 9 (see, for example, the 1975 entries in Table 4); the total cumulative balance of funds obligated in 1975 and prior years, but not yet spent as at 31 December 1975, is given at the bottom of this column in Tables 4, 7 and 8.
4. Assistance in kind has been separated into two parts. The first part consists of assistance which has been provided - for example, fellowship training already provided - expressed in terms of estimated cash expenditures. The second part is made up of assistance which is in the process of being provided - for example, fellowship training not yet completed - which is equivalent to unliquidated obligations (see column (10) in Tables 4, 7 and 8). The provision of expert services and equipment in kind has been shown in the same way.

5. Some minor corrections have also been made in the financial statistics relating to assistance provided in kind during prior years which take into account, inter alia, candidates who were withdrawn subsequent to the award of Type II fellowships, that is, after 31 December of a given year. Further, as the Agency exercises no financial control over assistance provided in kind, delay is occasionally experienced in receiving information on equipment deliveries, interruption in fellowship training, etc.

Types of assistance

6. (a) Experts. When not shown separately, the assignments of lecturers and visiting professors are included under the heading "Experts". With regard to Table 6, it should be noted that under "Intercountry programmes" the assignments of a number of experts are not subdivided by region but included, with associated training awards, under the heading "Short-term training projects";
- (b) Equipment. As can best be seen in Table 7, the total assistance provided under this heading is the sum of the amounts disbursed for equipment and supplies in respect of country and intercountry programmes; and
- (c) Fellowships. In Table 3, where awards are classified by place of study, columns relating to short-term regional training projects and scientific visits have been introduced in order to reflect more accurately the valuable contribution made by host countries. The UNDP country, Agency Type I and Type II awards shown in Tables 3 and 6 constitute the total effective awards as of 31 December 1975 (all notifications of non-acceptances by the proposed host countries and of withdrawals by the nominating countries communicated to the Agency by the close of the year have been taken into account). In Table 6 the number of fellowships classified by nationality does not include awards for short-term training projects and scientific visits, since their inclusion would significantly distort the statistics relating primarily to holders of fellowships of 6-12 months' duration. Although awards for short-term training projects and scientific visits are included in Table 6 under "UNDP" and "Agency Type I" (in Table 5 under "Number of fellowships") and are financed under "in kind" and "multi-bilateral" arrangements, the regular programme or UNDP, they are not in the same category as Type I, Type II or UNDP country awards. Furthermore, in the financial summaries (Tables 7 and 8) the expenditure on, for example, short-term training projects is not shown as assistance to individual countries but to "Intercountry programmes". None of the tables includes any reference to local participants in short-term training projects (see Annex III).

Intercountry programmes

7. In the broadest sense, this heading covers expenditure on regional projects for which experts' services only were provided (for example, by regional advisers), regional and interregional projects for which experts, equipment and fellowships were provided (for example, short-term training courses), and regional and interregional projects for which fellowships only were provided (for example, scientific visits).

Subcontract activities and funds-in-trust arrangements

8. The statistical tables do not include data relating to services provided by the Agency under subcontracts to other organizations, or in respect of projects carried out at the expense of developing countries under funds-in-trust arrangements.

Figures and percentages

9. Due to the rounding-off of monetary amounts to the nearest hundred or thousand dollars, the totals indicated in various places may differ slightly. In preparing figures and tables, percentages have also been rounded off.

A. TECHNICAL ASSISTANCE RESOURCES

Table 1

Available resources: 1966-1975
(in thousands of dollars)

Year	Agency		UNDP		Sub-totals		TOTAL (3)+(4) (5)
	Monetary (1a)	In kind ^{a/} (1b)	Monetary (2a)	In kind ^{a/} (2b)	Monetary (3)	In kind ^{a/} (4)	
1966	1 263	526	1 462	2	2 725	528	3 253
1967	1 380	565	1 431	5	2 811	570	3 381
1968	1 348	560	1 422	5	2 770	565	3 335
1969	1 586	654	981	4	2 567	658	3 225
1970	1 749	915	1 513	17	3 262	932	4 194
1971	2 224	1 368	1 775	42	3 999	1 410	5 409
1972	2 636	962	2 072	6	4 708	968	5 676
1973	3 124	1 264	1 964	35	5 088	1 299	6 387
1974	3 348	1 454	3 082	31	6 430	1 485	7 915
1975	4 540	1 294	3 941	38	8 481	1 332	9 813
1966- 1975	23 198	9 562	19 643	185	42 841	9 747	52 588

^{a/} Estimated; see Introductory Notes, paras 1 and 2, to this Annex.

Table 2

Funds for the Agency's regular programme of technical assistance: 1966-1975
(in thousands of dollars)

Item	1966-1971	1972	1973	1974	1975	1966-1975
Target for voluntary contributions to the General Fund ^{a/}	12 500	3 000	3 000	3 000	4 500	26 000
Share of target budgeted for technical assistance	11 449	3 000	3 000	3 000	4 500	24 949
Amount pledged	9 437	2 485	2 847	3 085	4 220	22 074
Actually made available for technical assistance ^{b/}	9 550	2 636	3 124	3 348	4 540	23 198

^{a/} Until 1972 a share of the funds from voluntary contributions was used to support other operational programme activities of the Agency; up to 1967 most of this share was used for research contracts, and over the period 1964-1969 \$210 000 was used for fellowships at the Trieste Centre.

^{b/} The funds from voluntary contributions are supplemented by miscellaneous income accruing to the General Fund and to Operating Fund II, which explains why the amount actually made available for technical assistance exceeded the amount pledged.

Table 3

Experts (classified by place of origin) and fellowship awards (classified by place of study): 1975

Place of origin of experts or place of study for holders of fellowship awards	Experts					Fellowship awards						TOTAL
	UNDP		Agency		TOTAL	UNDP		Agency			Scientific visits	
	Paid	Free	Paid	Free		Country	Regional	Type I	Type II	Regional		
Argentina	6 ^{a/}	-	4	-	10	2 ^{b/}	-	1	1	-	-	4
Australia	-	-	-	-	-	1 ^{b/}	14	2	-	-	-	17
Austria	3 ^{a/}	-	2	-	5	-	20	2	3 ^{c/}	-	-	25
Bangladesh	1	-	1	-	2	-	-	-	-	-	-	-
Belgium	-	-	2	1	3	5 ^{b/}	-	2	3	-	2	12
Brazil	1 ^{a/}	-	1	-	2	-	-	-	4	14	-	18
Bulgaria	-	-	1	-	1	-	-	-	-	22	-	22
Canada	8 ^{a/}	-	7	3	18	6 ^{b/}	-	5	-	-	3	14
Colombia	-	-	-	-	-	1 ^{b/}	-	-	-	-	-	1
Czechoslovakia	2	-	2	-	4	-	-	-	4	22	-	26
Denmark	4 ^{a/}	-	-	-	4	4 ^{b/}	-	1	4	-	2	11
Egypt	3	-	1	-	4	-	14	6	-	-	-	20
Finland	-	-	2	-	2	-	-	-	-	-	1	1
France	4 ^{a/}	-	7	3	14	10 ^{b/}	-	6	16	-	13	45
German D.R.	-	-	1	1	2	-	-	-	-	22	-	22
Germany, F.R.	9 ^{a/}	-	19	1	29	19 ^{b/}	-	10	21 ^{c/}	48	15	113
Greece	1	-	-	-	1	-	-	1	-	-	1	2
Hungary	-	-	-	-	-	-	-	-	2 ^{c/}	-	-	3
India	2	-	9	-	11	-	-	-	4 ^{c/}	-	-	4
Indonesia	1 ^{a/}	-	-	-	1	-	-	-	-	-	1	1
Iran	-	-	1	-	1	-	-	-	-	-	-	-
Israel	3 ^{a/}	-	2	-	5	-	-	-	4	-	-	4
Italy	8 ^{a/}	-	2	-	10	-	8	2	27	6	7	50
Jamaica	-	-	-	-	-	-	22	-	-	-	-	22
Japan	2 ^{a/}	-	1	-	3	6 ^{b/}	-	1	6 ^{c/}	-	-	13
Korea, R.	-	-	-	-	-	-	-	-	-	12	-	12
Mexico	-	-	-	-	-	-	-	1	-	-	1	2
Netherlands	2 ^{a/}	1	3	-	6	-	-	1	9 ^{c/}	-	4	14
New Zealand	-	-	-	-	-	-	-	-	1 ^{c/}	-	-	1
Norway	1 ^{a/}	-	1	-	2	1	-	-	-	-	1	2
Philippines	1 ^{a/}	-	-	-	1	-	-	-	-	-	-	-
Poland	1	-	4	-	5	-	-	-	2	17	-	19
Portugal	-	-	1	-	1	-	-	-	-	-	-	-
Romania	-	-	1	-	1	-	-	-	1	-	-	1
Spain	10 ^{a/}	-	4	-	14	4 ^{b/}	-	1	1	-	6	12
Sudan	-	-	-	-	-	-	-	-	-	13 ^{c/}	-	13
Sweden	5 ^{a/}	-	5	9	19	1 ^{b/}	-	10	4 ^{c/}	-	4	19
Switzerland	1 ^{a/}	-	1	-	2	1	-	-	-	-	5	6
USSR	-	-	3	-	3	-	-	-	4 ^{c/}	22	1	27
UK	14 ^{a/}	-	21	1	36	20 ^{b/}	-	70	5 ^{c/}	-	12	107
USA	22 ^{a/}	1	22	3	48	18 ^{b/}	-	38	74 ^{c/}	71	6	207
Uruguay	1 ^{a/}	-	-	-	1	-	-	-	-	-	-	-
Yugoslavia	4	-	5	-	9	-	-	1	6 ^{c/}	-	2	9
Zambia	-	-	-	-	-	-	7	-	-	-	-	7
IAEA	23 ^{a/}	-	32	-	55	4 ^{b/}	-	15	1 ^{c/}	-	8	28
Other international organizations	-	1	2	3	6	-	-	-	-	-	-	-
TOTAL	143	3	170	25	341	103	85	176	207	269	96	936 ^{d/}

a/ Includes the following large-scale project experts, from: Argentina, four; Austria, two; Brazil, one; Canada, five; Denmark, one; France, four; Germany, F.R., three; Indonesia, one; Israel, two; Italy, four; Japan, one; Netherlands, two; Norway, one; Philippines, one; Spain, nine; Sweden, two; Switzerland, one; United Kingdom, six; United States, eleven; Uruguay, one; IAEA staff, five.

b/ Includes the following large-scale project awards, in: Argentina, two; Australia, one; Belgium, three; Canada, six; Colombia, one; Denmark, one; France, nine; Germany, F.R., 14; Japan, five; Spain, four; Sweden, one; United Kingdom, eight; United States, 12; IAEA, two.

c/ Includes the following SIDA-financed awards, in: Austria, two; Germany, F.R., two; India, three; Japan, one; Netherlands, one; New Zealand, one; Sweden, four; United Kingdom, five; United States, seven; Yugoslavia, five; IAEA, one; as well as 13 participants in a training course held in the Sudan.

d/ The difference between the number of awards (765) and the number of places of study (936) is due to the fact that 21 fellows studied in two, five in three, two in four and two in six different countries, 22 participants in a study tour went to four countries; 38 participants in the scientific visit programme went to 96 places of study.

B. DISTRIBUTION OF TECHNICAL ASSISTANCE

Table 4

Types of technical assistance: 1966-1975
(in thousands of dollars)

TYPE	Experts		Visiting professors		Equipment		Fellowships		Scientific visits		Intercountry projects		Sub-contracts		TOTAL		Assistance outstanding at 31 December 1975		TOTAL	
																	Unliquidated obligations	In kind ^{a/} balance ^{a/}	(8)+(9) +(10)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	\$	\$	
1966-1971																				
UNDP monetary	3 468.4	40.8	-	-	2 469.6	29.0	779.2	9.2	-	-	1 282.2	15.1	501.7	5.9	8 501.1	100.0	-	-	8 501.1	
Agency monetary	2 919.1	35.3	489.3	5.9	1 903.8	23.1	2 068.2	25.0	122.3	1.5	763.1	9.2	-	-	8 265.8	100.0	27.2	-	8 293.0	
Assistance in kind ^{a/}	62.5	1.5	-	-	815.4	19.4	3 144.9	74.8	-	-	183.4	4.4	-	-	4 206.2	100.0	-	-	4 206.2	
TOTAL	6 450.0	30.8	489.3	2.3	5 188.8	24.7	5 992.3	28.6	122.3	0.6	2 228.7	10.6	501.7	2.4	20 973.1	100.0	27.2	-	21 000.3	
1972																				
UNDP monetary	818.3	39.5	-	-	768.2	37.1	162.8	7.9	-	-	127.5	6.1	195.2	9.4	2 072.0	100.0	-	-	2 072.0	
Agency monetary	822.2	32.2	49.6	1.9	801.4	31.4	594.6	23.3	28.9	1.1	259.3	10.1	-	-	2 556.0	100.0	43.5	-	2 599.5	
Assistance in kind ^{a/}	8.1	0.9	-	-	92.0	10.6	681.1	78.8	-	-	83.5	9.7	-	-	864.7	100.0	-	11.2	875.9	
TOTAL	1 648.6	30.0	49.6	0.9	1 661.6	30.2	1 438.5	26.2	28.9	0.5	470.3	8.6	195.2	3.6	5 492.7	100.0	43.5	11.2	5 547.4	
1973																				
UNDP monetary	921.4	46.9	-	-	501.5	25.5	257.7	13.1	-	-	103.3	5.3	180.4	9.2	1 964.3	100.0	-	-	1 964.3	
Agency monetary	881.6	32.9	21.0	0.8	998.1	37.7	453.3	16.9	82.2	3.1	239.7	9.0	-	-	2 675.9	100.0	129.1	-	2 805.0	
Assistance in kind ^{a/}	25.6	2.3	-	-	351.2	31.2	642.7	57.0	-	-	107.0	9.5	-	-	1 126.5	100.0	-	7.4	1 133.9	
TOTAL	1 828.6	31.7	21.0	0.4	1 850.8	32.1	1 353.7	23.5	82.2	1.4	450.0	7.8	180.4	3.1	5 766.7	100.0	129.1	7.4	5 903.2	
1974																				
UNDP monetary	906.3	29.4	-	-	1 323.2	42.9	305.3	9.9	-	-	304.0	9.9	242.8	7.9	3 081.6	100.0	-	-	3 081.6	
Agency monetary	986.0	40.8	16.3	0.7	767.5	31.8	462.4	19.2	60.9	2.5	120.1	5.0	-	-	2 413.2	100.0	728.8	-	3 142.0	
Assistance in kind ^{a/}	34.1	2.7	-	-	361.9	29.0	714.2	57.3	-	-	137.5	11.0	-	-	1 247.7	100.0	-	238.5	1 486.2	
TOTAL	1 926.4	28.6	16.3	0.2	2 452.6	36.4	1 481.9	22.0	60.9	0.9	561.6	8.3	242.8	3.6	6 742.5	100.0	728.8	238.5	7 709.8	
1975																				
UNDP monetary	1 568.1	39.8	-	-	1 150.4	29.2	379.9	9.6	-	-	237.5	6.0	605.6	15.4	3 941.5	100.0	1 135.2	-	5 076.7	
Agency monetary	957.3	28.0	36.1	1.1	1 337.5	39.1	761.6	22.2	76.5	2.2	254.5	7.4	-	-	3 423.5	100.0	1 538.7	-	4 962.2	
Assistance in kind ^{a/}	48.6	4.1	-	-	254.6	21.4	741.4	62.3	-	-	144.7	12.2	-	-	1 189.3	100.0	-	967.3	2 156.6	
TOTAL	2 574.0	30.1	36.1	0.4	2 742.5	32.1	1 882.9	22.0	76.5	0.9	636.7	7.4	605.6	7.1	8 554.3	100.0	2 673.9	967.3	12 195.5	
1966-1975																				
UNDP monetary	7 682.5	39.3	-	-	6 212.9	31.8	1 884.9	9.6	-	-	2 054.5	10.5	1 725.7	8.8	19 560.5	100.0	1 135.2	-	20 695.7	
Agency monetary	6 566.2	34.0	612.3	3.2	5 808.3	30.0	4 340.1	22.4	370.8	1.9	1 636.7	8.5	-	-	19 334.4	100.0	2 467.3	-	21 801.7	
Assistance in kind ^{a/}	178.9	2.1	-	-	1 875.1	21.7	5 924.3	68.6	-	-	656.1	7.6	-	-	8 634.4	100.0	-	1 224.4	9 858.8	
TOTAL	14 427.6	30.4	612.3	1.3	13 896.3	29.2	12 149.3	25.6	370.8	0.8	4 347.3	9.1	1 725.7	3.6	47 529.3	100.0	3 602.5	1 224.4	52 356.2	

a/ Estimated; see Introductory Notes, paras 4 and 5, to this Annex.

b/ The 1975 Agency monetary figures include miscellaneous and bank charges amounting to \$8800 under "Experts", \$6400 under "Equipment" and \$900 under "Fellowships".

Table 5

Fields of technical assistance: 1975

Field	Number of expert assignments	Cost of equipment (in thousands of dollars)	Number of fellowship awards ^{a/}
General atomic energy development	24	119.7	16
Nuclear physics	17	281.1	44
Nuclear chemistry	8	224.0	25
Prospecting, mining and processing of nuclear materials	48	378.3	37
Nuclear engineering and technology	98	493.3	231
Application of isotopes and radiation in agriculture	82	708.6	158
in medicine	22	218.7	73
in biology	2	67.9	21
in industry and hydrology	20	812.7	61
Safety in nuclear energy	42	83.4	99
TOTAL	363	3 387.7	765

^{a/} These figures include 288 participants in 16 regional and interregional short-term training projects and 38 holders of awards for scientific visits.

Table 6

Recipients of expert services and fellowship awards: 1975

RECIPIENT	Number of expert assignments, classified by location of duty station								Number of fellowship awards, classified by nationality of award holder									
	UNDP				Agency				TOTAL	UNDP	Agency				TOTAL			
	Paid		Free		Paid		Free				Type I		Type II					
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)				
<u>Country programmes:</u>																		
Afghanistan	1	4	-	-	-	-	-	-	1	4	-	-	-	-	-	-	-	
Albania	1	1	-	-	1	1	-	-	2	2	-	-	2	6	-	-	2	6
Algeria	-	-	-	-	3	2	1	1	4	3	-	-	-	-	-	-	-	-
Argentina	4 ^{a/}	6	-	-	11	15	-	-	15	21	5 ^{b/}	51	5	27	6	57	16	135
Bangladesh	-	-	-	-	2	7	1	1	3	8	-	-	6	57	17	150	23	207
Bolivia	1 ^{a/}	3	-	-	-	-	-	-	1	3	- ^{b/}	-	1	6	-	-	1	6
Brazil	16 ^{a/}	65	-	-	9	32	-	-	25	97	6 ^{b/}	24	5	33	5	45	16	102
Bulgaria	-	-	-	-	2	1	-	-	2	1	-	-	3	34	8	75	11	109
Burma	1 ^{a/}	12	-	-	-	-	-	-	1	12	- ^{b/}	-	1	12	1	12	2	24
Chile	19 ^{a/}	52	-	-	2	5	-	-	21	57	3 ^{b/}	26	-	-	1	6	4	32
Colombia	-	-	-	-	2	2	-	-	2	2	-	-	-	-	2	13	2	13
Costa Rica	-	-	-	-	-	-	-	-	-	-	-	-	-	4	48	4	4	48
Cuba	-	-	-	-	-	-	-	-	-	-	-	-	-	4	36	4	4	36
Cyprus	-	-	-	-	-	-	-	-	-	-	-	1	6	1	6	2	2	12
Czechoslovakia	-	-	-	-	-	-	-	-	-	-	-	3	19	9	88	12	107	
Ecuador	-	-	-	-	1	4	-	-	1	4	-	-	-	-	-	-	-	-
Egypt	-	-	-	-	2	7	-	-	2	7	-	-	5	44	8	86	13	130
Ethiopia	3	6	-	-	-	-	-	-	3	6	-	-	4	39	1	2	5	41
Ghana	-	-	-	-	2	4	-	-	2	4	3	40	8	61	2	26	13	127
Greece	5 ^{a/}	48	-	-	6	17	-	-	11	65	1	6	8	62	4	42	13	110
Hong Kong	-	-	-	-	-	-	-	-	-	-	- ^{b/}	-	2	6	-	-	2	6
Hungary	2 ^{a/}	1	-	-	-	-	-	-	2	1	4 ^{b/}	4	3	34	9	84	16	122
Iceland	-	-	-	-	-	-	-	-	-	-	-	1	9	1	3	2	12	
India	-	-	-	-	-	-	-	-	-	-	14 ^{b/}	43	9	96	12	108	35	247
Indonesia	7 ^{a/}	17	-	-	4	14	-	-	11	31	2 ^{b/}	24	3	18	-	-	5	42
Iran	-	-	-	-	-	-	-	-	-	-	-	1	5	1	9	2	14	
Iraq	-	-	-	-	-	-	-	-	-	-	-	6	61	6	42	12	103	
Israel	2	1	-	-	4	5	-	-	6	6	1	1	2	15	3	26	6	42
Ivory Coast	1	2	-	-	1	1	-	-	2	3	-	-	-	-	-	-	-	-
Jamaica	-	-	-	-	1	3	-	-	1	3	-	-	-	-	-	-	-	-
Jordan	-	-	-	-	1	12	-	-	1	12	-	-	2	8	-	-	2	8
Kenya	-	-	-	-	2	9	-	-	2	9	-	-	2	13	2	18	4	31
Korea, R.	2 ^{a/}	6	-	-	4	24	-	-	6	30	4 ^{b/}	24	6	63	9	93	19	180
Kuwait	-	-	-	-	1	1	-	-	1	1	-	-	-	-	-	-	-	-
Lebanon	2	13	-	-	1	1	-	-	3	14	-	-	-	-	-	-	-	-
Libyan A. R.	-	-	-	-	1	1	-	-	1	1	-	-	-	-	-	-	-	-
Malaysia	-	-	-	-	1	4	-	-	1	4	-	-	4	42	1	6	5	48
Mali	-	-	-	-	1	12	-	-	1	12	-	-	-	2	15	2	15	
Mexico	1	1	-	-	8	22	-	-	9	23	-	1	6	6	36	7	42	
Mongolia	-	-	-	-	-	-	-	-	-	-	-	-	-	4	27	4	27	
Morocco	5 ^{a/}	24	-	-	1	10	-	-	6	34	3 ^{b/}	24	-	-	-	-	3	24
Nigeria	1 ^{a/}	3	-	-	2	23	-	-	3	26	-	-	1	6	1	6	2	12
Pakistan	9 ^{a/}	57	-	-	2	4	-	-	11	61	1	12	9	83	12	116	22	211
Peru	-	-	-	-	3	10	-	-	3	10	-	-	1	12	3	36	4	48
Philippines	-	-	-	-	3	3	-	-	3	3	-	-	11	100	7	78	18	178
Poland	-	-	-	-	-	-	-	-	-	-	-	-	10	105	7	84	17	189
Romania	8 ^{a/}	16	-	-	2	1	-	-	10	17	14 ^{b/}	106	4	44	3	28	21	178
Senegal	-	-	-	-	1	1	-	-	1	1	-	-	-	-	-	-	-	-
Sierra Leone	1	12	1	12	-	-	-	-	2	24	2	21	-	-	-	-	2	21
Singapore	-	-	-	-	1	1	-	-	1	1	-	-	2	4	-	-	2	4
Somalia	1	2	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-
Sri Lanka	-	-	-	-	2	7	-	-	2	7	-	-	3	36	4	36	7	72
Sudan	1	5	-	-	2	12	-	-	3	17	1	10	5	51	7	81	13	142
Syrian A. R.	5	2	-	-	-	-	-	-	5	2	1	12	6	60	4	32	11	104
Thailand	1	3	-	-	5	11	-	-	6	14	-	-	5	48	4	41	9	89

RECIPIENT	Number of expert assignments, classified by location of duty station										Number of fellowship awards, classified by nationality of award holder								
	UNDP				Agency				TOTAL		UNDP		Agency				TOTAL		
	Paid		Free		Paid		Free		(1)	(2)	(1)	(2)	Type I		Type II		(1)	(2)	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)					(1)	(2)	(1)	(2)			
Tunisia	-	-	-	-	1	8	1	3	2	11	- ^{b/}	-	-	-	-	-	-	-	-
Turkey	6 ^{a/}	53	-	-	5	9	-	-	11	62	2 ^{b/}	10	9	86	7	77	18	173	
Uganda	-	-	-	-	-	-	-	-	-	-	-	-	1	12	-	-	-	1	12
United Republic of Cameroon	3	12	-	-	-	-	-	-	3	12	-	-	-	-	-	-	-	-	-
Uruguay	-	-	-	-	4	8	-	-	4	8	-	-	-	-	1	6	1	6	
Venezuela	2	1	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	
Yugoslavia	2 ^{a/}	2	-	-	4	8	-	-	6	10	9 ^{b/}	24	7	69	3	27	19	120	
Zaire	-	-	-	-	-	-	1	1	1	1	-	-	1	3	1	12	2	15	
Zambia	1 ^{a/}	9	-	-	-	-	-	-	1	9	-	-	-	-	1	4	1	4	
Sub-total	114	439	1	12	111	322	4	6	230	779	76	462	169	1501	194	1823	439	3786	
<u>Intercountry programmes:</u>																			
Short-term training projects	42	39	2	1	67	21	22	4	133	65	85	94	190	265	13	11	288	370	
Scientific visits	-	-	-	-	-	-	-	-	-	-	-	-	38	44	-	-	38	44	
Sub-total	42	39	2	1	67	21	22	4	133	65	85	94	228	309	13	11	326	414	
GRAND TOTAL	156	478	3	13	178	343	26	10	363 ^{c/}	844	161	556	397	1810	207	1834	765	4200	

- (1) Number
(2) Number of man-months

^{a/} Includes the following large-scale project experts: four/6 man-months, Argentina; 12/48 man-months, Brazil; 19/52 man-months, Chile; five/48 man-months, Greece; two/1 man-month, Hungary; one/2 man-months, Indonesia; two/6 man-months, Korea, R. ; four/20 man-months, Morocco; one/3 man-months, Nigeria; seven/55 man-months, Pakistan; eight/16 man-months, Romania; six/53 man-months, Turkey; one/1 man-month, Yugoslavia; one/9 man-months, Zambia.

^{b/} Includes the following large-scale project awards: three/27 man-months, Argentina; three/6 man-months, Brazil; three/26 man-months, Chile; four/4 man-months, Hungary; ten/29 man-months, India; two/24 man-months, Indonesia; four/24 man-months, Korea, R. ; three/24 man-months, Morocco; 14/106 man-months, Romania; two/10 man-months, Turkey; two/2 man-months, Yugoslavia.

^{c/} The difference between the number of assignments (363) and the actual number of experts (341) is due to the fact that each of 13 experts served in two, three in three, and one in four different countries.

Table 7
Financial summary: 1975
(in thousands of dollars)

RECIPIENT	Assistance provided, by type				Assistance provided, by source				Assistance outstanding at 31 December 1975		TOTAL (8) + (9) + (10)	
	Experts	Equip- ment	Fellow- ships	TOTAL	UNDP		Agency		TOTAL	Unliqui- dated obli- gations		In kind balance ^{a/}
					Monetary	In kind ^{a/}	Monetary	In kind ^{a/}				
					(1)	(2)	(3)	(4)				
Country programmes:												
Afghanistan	13,5	0,8	-	14,3	14,3	-	-	-	14,3	0,4	-	14,7
Albania	3,5	60,5	3,3	67,3	50,8	-	16,5	-	67,3	49,7	-	117,0
Algeria	4,5	-	3,9	8,4	-	-	5,3	3,1	8,4	0,5	-	8,9
Argentina	54,0	76,4	56,5	186,9	96,2	-	72,0	18,7	186,9	43,3	23,8	254,0
Bangladesh	15,3	31,9	86,8	134,0	-	-	69,6	64,4	134,0	43,5	52,3	229,8
Bolivia	12,4	12,5	5,4	30,3	21,3	-	6,4	2,6	30,3	5,7	-	36,0
Brazil	151,7	5,0	54,0	210,7	77,3	-	120,5	12,9	210,7	27,1	18,2	256,0
Bulgaria	5,5	19,4	66,2	91,1	-	-	54,3	36,8	91,1	29,9	36,2	157,2
Burma	43,2	54,7	4,5	102,4	59,7	-	40,9	1,8	102,4	14,1	6,9	123,4
Chile	15,9	19,5	2,8	38,2	-	-	38,2	-	38,2	-	3,0	41,2
Colombia	15,3	0,6	24,7	40,6	-	-	16,6	24,0	40,6	30,7	4,8	76,1
Costa Rica	0,3	30,3	6,8	37,4	-	-	20,9	16,5	37,4	6,5	22,2	66,1
Cuba	-	141,1	8,6	149,7	-	-	145,9	3,8	149,7	52,0	9,7	211,4
Cyprus	-	0,2	5,5	5,7	-	-	5,7	-	5,7	2,9	16,6	25,2
Czechoslovakia	-	-	72,5	72,5	-	-	34,3	38,2	72,5	15,3	38,7	126,5
Dominican Republic	-	-	2,3	2,3	-	-	-	2,3	2,3	-	0,8	3,1
Ecuador	11,8	8,9	1,2	21,9	-	-	21,9	-	21,9	32,6	-	54,5
Egypt	20,7	86,9	92,5	200,1	-	-	150,0	50,1	200,1	36,3	48,0	284,4
Ethiopia	20,3	6,9	6,4	33,6	20,3	-	13,3	-	33,6	18,5	1,0	53,1
Ghana	5,8	49,0	52,9	107,7	18,3	-	43,8	45,6	107,7	44,6	10,2	162,5
Greece	50,7	29,7	50,9	131,3	2,4	-	110,5	18,4	131,3	57,4	23,3	212,0
Guatemala	-	8,4	-	8,4	-	-	2,3	6,1	8,4	4,7	-	13,1
Hong Kong	-	22,5	8,4	30,9	-	-	30,9	-	30,9	2,7	-	33,6
Hungary	-	63,7	44,9	108,6	-	-	90,8	17,8	108,6	136,7	32,6	277,9
Iceland	-	35,2	5,9	41,1	-	-	37,9	3,2	41,1	4,0	-	45,1
India	4,9	114,8	119,3	239,0	27,1	-	165,5	46,4	239,0	127,4	74,5	440,9
Indonesia	95,2	52,5	15,7	163,4	50,4	-	111,4	1,6	163,4	63,3	16,0	242,7
Iran	1,7	-	10,8	12,5	-	-	4,6	7,9	12,5	4,1	2,7	19,3
Iraq	-	72,2	64,5	136,7	-	-	114,9	21,8	136,7	355,9	19,5	512,1
Israel	13,3	61,0	45,4	119,7	6,1	-	84,8	28,8	119,7	13,5	9,3	142,5
Ivory Coast	10,1	1,4	-	11,5	8,4	-	3,1	-	11,5	23,2	-	34,7
Jamaica	9,2	13,9	-	23,1	-	-	9,6	13,5	23,1	-	-	23,1
Jordan	31,2	-	15,4	46,6	12,6	-	34,0	-	46,6	2,2	-	48,8
Kenya	30,4	1,9	13,3	45,6	-	-	36,7	8,9	45,6	8,6	2,3	56,5
Korea, Republic of	79,0	0,3	41,2	120,5	-	-	108,4	12,1	120,5	80,7	52,5	253,7
Kuwait	1,9	-	-	1,9	-	-	1,9	-	1,9	-	-	1,9
Lebanon	51,4	15,3	8,4	75,1	47,9	-	27,2	-	75,1	7,6	-	82,7
Libyan Arab Republic	2,2	22,2	-	24,4	-	-	24,4	-	24,4	6,3	-	30,7
Madagascar	(3,8)	-	-	(3,8)	-	-	(3,8)	-	(3,8)	-	-	(3,8)
Malaysia	16,8	-	17,7	34,5	-	-	34,5	-	34,5	22,3	4,8	61,6
Mali	44,9	5,1	-	50,0	-	-	50,0	-	50,0	-	7,0	57,0
Mexico	72,9	-	23,3	96,2	3,5	-	81,5	11,2	96,2	15,0	17,7	128,9
Mongolia	-	27,5	1,0	28,5	-	-	27,5	1,0	28,5	9,2	15,0	52,7
Morocco	48,3	0,9	8,1	57,3	14,0	-	41,2	2,1	57,3	18,2	39,6	115,1
Nicaragua	-	0,2	-	0,2	-	-	0,2	-	0,2	-	-	0,2
Nigeria	64,4	19,4	6,1	89,9	-	-	89,9	-	89,9	15,1	2,8	107,8
Pakistan	22,0	81,0	82,8	185,8	13,0	-	134,2	38,6	185,8	126,1	85,3	397,2
Peru	38,7	34,8	16,0	89,5	-	-	75,2	14,3	89,5	27,6	41,0	158,1
Philippines	7,9	25,1	54,6	87,6	-	-	56,8	30,8	87,6	102,8	46,6	237,0
Poland	-	6,2	55,1	61,3	-	-	41,9	19,4	61,3	142,0	34,4	237,7

RECIPIENT	(1)	(2)	(3)	(4)	(5a)	(5b)	(6)	(7)	(8)	(9)	(10)	(11)
Rep. of South Viet-Nam	-	3,1	0,3	3,4	-	-	3,4	-	3,4	8,2	-	11,6
Romania	1,5	59,2	18,6	79,3	-	-	76,5	2,8	79,3	119,7	7,3	206,3
Senegal	2,5	3,0	4,2	9,7	-	-	9,7	-	9,7	1,3	-	11,0
Sierra Leone	66,2	31,4	7,2	104,8	80,6	24,2	-	-	104,8	0,9	-	105,7
Singapore	6,0	28,2	10,6	44,8	-	-	41,0	3,8	44,8	43,7	-	88,5
Somalia	6,3	-	-	6,3	6,3	-	-	-	6,3	-	-	6,3
Sri Lanka	17,3	62,8	28,8	108,2	11,1	-	92,3	4,8	108,2	17,4	17,6	143,2
Sudan	55,4	130,5	70,2	256,1	139,5	-	108,1	8,5	256,1	44,4	55,5	356,0
Syrian Arab Republic	7,7	69,4	29,8	106,9	78,5	-	11,0	17,4	106,9	67,9	15,5	190,3
Thailand	43,6	30,6	85,4	159,6	10,5	-	69,0	80,1	159,6	64,0	30,8	254,4
Tunisia	32,0	16,6	-	48,6	-	-	22,6	26,0	48,6	11,3	-	59,9
Turkey	24,1	24,3	77,4	125,8	-	-	82,1	43,7	125,8	38,1	31,4	195,3
Uganda	-	9,3	1,4	10,7	-	-	10,7	-	10,7	12,0	-	22,7
United Rep. of Cameroon	42,3	17,9	3,8	64,0	60,2	-	3,8	-	64,0	13,9	-	77,9
Uruguay	22,5	42,0	18,0	82,5	4,4	-	40,2	37,9	82,5	2,7	1,8	87,0
Venezuela	3,8	1,6	2,5	7,9	3,8	-	4,1	-	7,9	0,2	-	8,1
Yugoslavia	22,4	87,4	44,0	153,8	69,8	-	60,4	23,6	153,8	40,6	7,9	202,3
Zaire	3,7	24,2	25,0	52,9	-	-	13,9	39,0	52,9	18,1	12,6	83,6
Zambia	-	-	8,8	8,8	-	-	-	8,8	8,8	8,3	-	17,1
Sub-total	1 444,3	1 961,3	1 700,9	5 106,5	1 008,3	24,2	3 152,9	921,1	5 106,5	2 342,9	999,7	8 449,1
<u>Inter-country programmes:</u>												
Africa	48,7	3,4	4,5	56,6	54,2	2,4	-	-	56,6	8,6	-	65,2
Asia and the Pacific	14,1	-	19,0	33,1	12,3	-	16,5	4,3	33,1	43,3	-	76,4
Interregional projects	149,2	68,1	329,7	547,0	171,0	10,6	238,0	127,4	547,0	291,0	23,6	861,6
Sub-total	212,0	71,5	353,2	636,7	237,5	13,0	254,5	131,7	636,7	342,9	23,6	1 003,2
Miscellaneous	8,8	6,4	0,9	16,1	-	-	16,1	-	16,1	-	-	16,1
<u>SIDA large-scale assistance</u>												
Bangladesh	2,7	89,1	7,1	98,9	-	-	-	98,9	98,9	-	201,1	300,0
<u>UNDP large-scale assistance</u>												
Argentina	29,2	47,8	16,2	93,2	93,2	-	-	-	93,2	48,1	-	141,3
Brazil	179,3	97,8	27,8	304,9	304,9	-	-	-	304,9	53,3	-	358,2
Chile	184,4	100,5	26,1	311,0	311,0	-	-	-	311,0	202,7	-	513,7
Egypt	-	181,6	6,9	188,5	188,5	-	-	-	188,5	179,8	-	368,3
Greece	172,8	37,4	17,5	227,7	227,7	-	-	-	227,7	3,4	-	231,1
Hungary	1,4	129,7	4,2	135,3	135,3	-	-	-	135,3	169,9	-	305,2
India	2,9	78,3	9,0	90,2	90,2	-	-	-	90,2	40,9	-	131,1
Indonesia	4,9	2,1	16,8	23,8	23,8	-	-	-	23,8	7,1	-	30,9
Korea, Republic of	18,1	195,8	23,1	237,0	237,0	-	-	-	237,0	42,5	-	279,5
Morocco	71,0	86,5	17,4	174,9	174,9	-	-	-	174,9	8,9	-	183,8
Nigeria	11,0	17,5	-	28,5	28,5	-	-	-	28,5	-	-	28,5
Pakistan	203,1	123,2	5,2	331,5	331,5	-	-	-	331,5	15,2	-	346,7
Romania	87,3	122,3	70,3	279,9	279,5	0,4	-	-	279,9	128,9	-	408,8
Turkey	186,9	38,9	7,9	233,7	233,7	-	-	-	233,7	4,4	-	238,1
Yugoslavia	2,1	-	2,1	4,2	4,2	-	-	-	4,2	11,6	-	15,8
Zambia	31,8	-	-	31,8	31,8	-	-	-	31,8	-	-	31,8
Sub-total	1 186,2	1 259,4	250,5	2 696,1	2 695,7	0,4	-	-	2 696,1	916,7	-	3 612,8
GRAND TOTAL	2 854,0	3 387,7	2 312,6	8 554,3	3 941,5	37,6	3 423,5	1 151,7	8 554,3	3 602,5	1 224,4	13 381,2

a/ Assistance in kind can only be estimated; see Introductory Notes, paras 4 and 5, to this Annex.

RECIPIENT	(1) ⁹	(2) ⁵	(3) ³	(4) ²	(5a) ⁵	(5b)	(6) ³	(7)	(8) ²	(9) ⁴	(10)	(11) ⁵
<u>Intercountry programmes:</u>												
Africa	120,4	76,3	96,1	292,8	282,2	4,9	5,7	-	292,8	8,6	-	301,4
Asia and the Pacific	369,4	116,6	222,1	708,1	549,4	44,3	95,6	18,8	708,1	43,3	-	751,4
Europe	21,0	18,6	17,3	56,9	56,9	-	-	-	56,9	-	-	56,9
Latin America	266,2	113,3	156,4	535,9	472,9	24,8	36,6	1,6	535,9	-	-	535,9
Middle East	5,8	1,2	5,3	12,3	12,3	-	-	-	12,3	-	-	12,3
Interregional projects	804,2	414,1	2 539,5	3 757,8	1 334,0	32,1	1 869,3	522,4	3 757,8	291,0	23,6	4 072,4
Sub-total	1 587,0	740,1	3 036,7	5 363,8	2 707,7	106,1	2 007,2	542,8	5 363,8	342,9	23,6	5 730,3
Miscellaneous	111,2	23,9	2,4	137,5	23,2	-	114,3	-	137,5	-	-	137,5
<u>SIDA large-scale assistance</u>												
Bangladesh	4,1	89,1	7,1	100,3	-	-	-	100,3	100,3	-	201,1	301,4
<u>UNDP large-scale assistance</u>												
Argentina	122,2	57,5	21,8	201,5	201,5	-	-	-	201,5	48,1	-	249,6
Brazil	373,7	294,2	90,6	758,5	754,8	3,7	-	-	758,5	53,3	-	811,8
Chile	258,9	100,5	50,3	409,7	409,7	-	-	-	409,7	202,7	-	612,4
Egypt	-	229,5	30,4	259,9	259,9	-	-	-	259,9	179,8	-	439,7
Greece	551,1	129,0	38,5	718,6	718,6	-	-	-	718,6	3,4	-	722,0
Hungary	1,7	194,5	12,9	209,1	209,1	-	-	-	209,1	169,9	-	379,0
India	658,1	1 404,5	170,6	2 233,2	2 233,2	-	-	-	2 233,2	40,9	-	2 274,1
Indonesia	23,2	31,9	25,7	80,8	80,8	-	-	-	80,8	7,1	-	87,9
Korea, Republic of	20,6	318,2	34,4	373,2	373,2	-	-	-	373,2	42,5	-	415,7
Morocco	102,1	111,5	18,1	231,7	231,7	-	-	-	231,7	8,9	-	240,6
Nigeria	13,5	18,0	-	31,5	31,5	-	-	-	31,5	-	-	31,5
Pakistan	538,2	544,3	39,2	1 121,7	1 121,3	0,4	-	-	1 121,7	15,2	-	1 136,9
Philippines	133,4	260,9	83,1	477,4	475,0	2,4	-	-	477,4	-	-	477,4
Romania	196,6	612,4	161,0	970,0	969,4	0,6	-	-	970,0	128,9	-	1 098,9
Turkey	297,5	480,6	11,8	789,9	789,9	-	-	-	789,9	4,4	-	794,3
Yugoslavia	201,4	318,0	72,7	592,1	592,1	-	-	-	592,1	11,6	-	603,7
Zambia	148,4	4,1	-	152,5	152,5	-	-	-	152,5	-	-	152,5
Central America	409,3	575,9	9,4	994,6	985,3	9,3	-	-	994,6	-	-	994,6
Sub-total	4 048,9	5 685,5	870,5	10 605,9	10 589,5	16,4	-	-	10 605,9	916,7	-	11 522,6
GRAND TOTAL	21 173,9	19 018,3	22 481,1	62 673,3	24 545,7	199,6	25 652,8	12 275,2	62 673,3	3 602,5	1 224,4	67 500,2

a/ Assistance in kind can only be estimated, see Introductory Notes, paras 4 and 5, to this Annex

b/ Includes the following countries which have not received technical assistance during the last ten or more years: Denmark, Finland, France, Germany, F.R., Monaco, Netherlands, Rhodesia, Sweden, Switzerland and the United States

ANNEX II

ASSISTANCE IN KIND FOR AGENCY TECHNICAL CO-OPERATION PROGRAMMES

A. Estimated value of the assistance in kind made available to the Agency in 1975

Donor	Assistance made available	Value \$
Argentina	Training for eight Type II fellows (47 man-months)	20 000
Austria	Training for three Type II fellows (20½ man-months)	8 900
Belgium	One expert and training for nine Type II fellows (32 man-months)	15 900
Brazil	One lecturer, training for two Type II fellows (13 man-months) and a contribution towards the cost of eight training course lecturers and stipends for training course participants	24 400
Canada	Five lecturers	3 400
Czechoslovakia	One lecturer and training for five Type II fellows (20½ man-months)	7 800
Denmark	One lecturer and training for four Type II fellows (28 man-months)	13 600
Egypt	Training for one Type II fellow (5 man-months)	1 500
Finland	Training for two Type II fellows (8 man-months)	4 900
France	Two experts, three lecturers and training for 15 Type II fellows (68½ man-months)	36 200
German D. R.	Two lecturers	2 000
Germany, F. R.	One expert, seven lecturers, equipment for a project in one country and training for 31 Type II fellows (168 man-months)	153 300
Greece	One lecturer	900
Hungary	Training for four Type II fellows (19½ man-months)	5 500
India	One expert, one lecturer and training for one Type II fellow (4 man-months)	5 100
Iraq	One lecturer	400
Israel	One lecturer	400
Italy	One lecturer and training for 26 Type II fellows (140 man-months)	37 400
Japan	One lecturer and training for ten Type II fellows (39 man-months)	19 500
Netherlands	One expert, one lecturer and training for 12 Type II fellows (80 man-months)	54 800
Philippines	Training for two Type II fellows (8 man-months)	1 700
Poland	Training for four Type II fellows (34 man-months)	10 900
Spain	One lecturer and training for six Type II fellows (36 man-months)	10 800
Sweden	One expert, 11 lecturers, equipment for a project in one country and one training course, training for 21 Type II fellows (107 man-months) and stipends for training course participants	210 600
Switzerland	One lecturer	300
USSR	One lecturer and training for five Type II fellows (27½ man-months)	17 000
UK	One expert and six lecturers	2 700
USA	Three experts, 13 lecturers, equipment for 12 projects in ten countries, training for 84 Type II fellows (512 man-months) and stipends for training course participants	511 100
Yugoslavia	Two lecturers and training for three Type II fellows (16 man-months)	3 400
International organizations	Six lecturers	4 900
TOTAL	11 experts, 68 lecturers, equipment for 14 projects in 12 countries and one training course, training for 258 Type II fellows (1433½ man-months) and a contribution towards the cost of eight training course lecturers and stipends for participants in five training courses	1 189 300

B. Possible assistance to projects not included in the 1975 regular programme
owing to lack of funds

Requesting country	Title of the project	Possible supplier	Assistance needed	Value of the assistance provided
Chile	Construction of gauges	France	Some equipment	Not known
	Ion implantation ^{a/}	France	An expert and equipment	Not known
Colombia	Radioimmunoassay	France	An expert and equipment	Not known
Malaysia	Use of radioisotopes in agriculture	USA	An expert and equipment	Not known
Mexico	Reactor physics	USA	An expert	Not known
	Electric design for power plants	USA	An expert	Not known
Peru	Radiopharmacy ^{b/}	France	Some equipment	Not known
Philippines	Environmental monitoring	USA	An expert and equipment	Not known
Thailand	Use of radioisotopes in animal science	USA	Some equipment	Not known

^{a/} This project was subsequently included in the 1976 regular programme. However, assistance will only be provided for this project in substitution for other assistance it is planned to provide to this Member, or if additional funds or services become available.

^{b/} This project was subsequently included in the 1976 regular programme.

Note: Following the procedure suggested by the Technical Assistance Committee (TAC) of the Board of Governors, the Director General, in a circular letter of 17 March 1975, brought to the attention of the technically advanced Member States the 32 requests for expert services and equipment which could not be submitted for approval to TAC - as part of the 1975 regular programme of technical assistance - for lack of funds, requesting those Member States to consider the possibility of meeting such requests through the Agency or on a bilateral basis by gift, loan or otherwise and informed them that details of the assistance needed would be provided on request. The Agency provided more detailed information on the nine projects mentioned above.

ANNEX III

INTERCOUNTRY PROJECTS: 1975

Project title	Place and dates	Source of funds	Participation ^{a/}		
			(1)	(2)	(3)
Interregional training course on methods and technical bases of nuclear energy regulation	Bethesda, Maryland 28 April to 16 May	Regular programme and Government of the United States of America	31	1	-
Interregional seminar on the preparation and implementation of nuclear power projects	Kingston, Jamaica 9 to 20 June	UNDP	22	-	15
Interregional training course on radio-immunoassay techniques	Poznan, Poland 15 to 28 June	Regular programme	17	3	1
Interregional training course on occupational and environmental safety in the utilization of radioactive material	Boston, Massachusetts 7 July to 1 August	Regular programme and Government of the United States of America	21	2	-
Interregional training course on the use of isotopes and radiation in entomology	Gainesville, Florida 7 July to 29 August	Regular programme and Government of the United States of America	19	-	-
Regional workshop on laboratory technicians' training	Seoul, Republic of Korea 27 to 31 October	Regular programme	12	-	5
Interregional training course on the use and maintenance of nuclear and related electronic equipment	Turin, Italy 1 September to 28 November	UNDP	14	2	-
Interregional training course on nuclear power project planning and implementation	Karlsruhe, Federal Republic of Germany 8 September to 19 December	Regular programme and Government of the Federal Republic of Germany	35	-	-
Interregional training course on uranium geochemical prospecting methods	Austria 8 September to 18 October	UNDP	20	-	2
Interregional seminar on radiation protection and waste handling in industry, chemistry, medicine and research	Berlin (West) 27 October to 7 November	Regular programme	13	-	-
Interregional training course on the use of nuclear techniques in animal production	Khartoum, Sudan 3 to 28 November	SIDA	13	-	5
Study tour on the use of nuclear and other techniques in animal production studies	Australia 10 November to 5 December	UNDP	14	-	-
Study tour on the development of nuclear power	Bulgaria, Czechoslovakia, German Democratic Republic and the Soviet Union 10 November to 9 December	Regular programme	22	-	-
Regional training course on the use of nuclear techniques for the study of chemical residue and pollution problems	Middle Eastern Regional Radioisotope Centre for the Arab Countries, Cairo, Egypt 3 to 28 November	UNDP	14	2	4
Interregional training course on food irradiation	Rio de Janeiro, Brazil 3 November to 12 December	Regular programme and Government of Brazil	14	-	17
Regional project on radiological health and safety measures, including a regional seminar held at:	East and West Africa January to December Lusaka, Zambia 27 October to 7 November	UNDP	-	-	109
Co-operative project in neutron scattering	Asia and the Pacific 1975	Regular programme	-	-	10

^{a/} The figures under (1) denote the number of award holders whose cost of participation was met out of project funds; those under (2) denote the number of participants who attended at the expense of the Government, another organization or programme; and those under (3) denote the number of local participants. No stipends or international travel costs are payable out of project funds in respect of participants shown under (2) and (3).

ANNEX IV

FORMAL REPORTS SUBMITTED TO RECIPIENT COUNTRY GOVERNMENTS^{a/}A. Experts' final reports

Reference number	Name of expert	Subject	Country of assignment
988	A. Sokolic	Preparatory mission in animal radiation studies	Pakistan
989	A. J. Boonstra	Medical applications of radioisotopes ^{b/}	Morocco
991	I. Berman	Reactor metallurgy ^{c/}	Argentina
992	A. J. Holding	Use of radioisotopes in agriculture	Greece
993	T. Hayes	Reactor utilization	Iran
994	H. F. Goso	Production of radioisotopes ^{c/}	Chile
995	J. Zamecnik	Hospital physics ^{c/}	Chile
996	Z. Khawza	Nuclear instrumentation	Singapore
997	G. Smith	Activation analysis	Indonesia
998	N. Veall	Radioisotopes in medicine	Iraq
999	K. Krishnamurthy	Production of radioisotopes (high intensity sources) (Part I) ^{c/}	Argentina
1000	G. Drexler	Secondary standards dosimetry laboratory	Brazil
1001	C. M. Sunta	Thermoluminescence dosimetry with ionic crystals	Brazil
1002	D. Sauerbeck	Use of isotopes in agriculture	Costa Rica
1003	B. England	Radioisotopes in medicine	Bulgaria
1006	L. Ehrenberg	Genetics	Yugoslavia
1007	R. W. Fink	Linear accelerator	Greece
1011	T. P. Parkinson	Nuclear kinetics ^{c/}	Argentina
1012	V. Vukmirovic	Radioisotopes in sedimentology	Brazil

Reference number	Name of expert	Subject	Country of assignment
1013	B. Bellesort	Utilization of radiotracers in sedimentology (third study of the movement of cohesive materials) ^{b/}	Brazil
1014	F. de la Cruz Castillo	Technological applications of nuclear energy ^{c/}	Chile
1015	Y. F. Belov	Accelerator engineering	Egypt
1016	V. Solntsev	Use of radioisotopes in industry	Bulgaria
1017	V. Middelboe	Isotopes in water-use efficiency	Syrian Arab Republic
1018	C. G. Lamm K. Mikaelson	Application of nuclear techniques in agriculture ^{c/}	Venezuela
1019	L. Fitts	Krsko nuclear power plant project	Yugoslavia
1020	G. W. C. Tait	Radiological protection ^{c/}	Guatemala
1021	A. G. McKee and Company	Appraisal and pre-investment study of the Sierra Pintada project	Argentina
1022	H. Hoeller W. Mulligan	Radioisotopes in animal science	Syrian Arab Republic
1023	H. Seligman	Industrial application of radioisotopes	Romania
1024	O. A. Wasson	Neutron physics	Greece
1025	A. Plata Bedmar	Isotope hydrology ^{c/}	Colombia
1026	L. J. Johansson	Use of radioisotopes in medicine	Sri Lanka
1027	A. Ward	Radiobiology (biodosimetry)	Philippines
1028	D. H. Locke	Defective fuel elements	Argentina
1029	Z. Hlasivec	Radiation dosimetry ^{b/}	Morocco
1030	E. F. Hamouda	Experimental nuclear physics	Burma
1031	K. P. Desai	Use of radioisotopes in hydrology	India
1032	T. Czvikovszky	Pilot plant for wood plastification ^{c/}	Venezuela

Reference number	Name of expert	Subject	Country of assignment
1033	N. Veall	Radioisotopes in medicine	Kuwait
1034	L. Kertesz	Use of radioisotopes in medicine	Burma
1035	V. Stenger	Irradiation techniques	Singapore
1036	G. Vachaud	Use of radioisotopes in agriculture ^{b/}	Senegal
1037	J. Taylor	Uranium exploration	Afghanistan
1038	M. Matolin	Raw materials prospection	Egypt
1039	D. Horler	Radiotracer studies of pesticide residue problems	Venezuela
1040	H. Altmann	Side effects of chemical compounds in food, agriculture and medicine	Hungary
1041	E. Touya	Use of radioisotopes in medicine ^{c/}	Chile
1042	A. Ben Haim	Whole-body counting	Uruguay
1043	J. Ketcheson	Use of radioisotopes in agriculture	Kenya
1044	R. Radicella	Production of radioisotopes (Part II) ^{c/}	Chile
1045	G. Lawrence	Nuclear materials prospection	Philippines
1046	Th. Dippel	Plutonium laboratory (Part II)	Argentina
1047	Y. Frolov	Solvent extraction	Yugoslavia
1048	U. Rosenow	Radiation dosimetry	Turkey
1049	U. V. Rocca	Programming and design of fuel element irradiation experiments	Brazil
1050	L. H. Lanzl	Thermoluminescence dosimetry applied to gonadal dose determinations, training programme in health and medical physics, secondary standards dosimetry laboratory	Turkey
1051	R. Adams	Use of radioisotopes in medicine	Pakistan

Reference number	Name of expert	Subject	Country of assignment
1052	R. F. Vogl	Use of radioisotopes in industry	Sri Lanka
1053	A. K. Basu	Use of radioisotopes in medicine	Thailand
1054	M. E. Langston	Quality assurance in design and construction of nuclear power plants	Mexico
1055	F. K. Pickert	Economics of the fuel cycle (Part I)	Argentina
1057	T. D. MacMahon	Activation analysis	Korea, R.
1058	T. J. Robertson	Reactor operation	Chile
1059	E. Wattecamps	Nuclear physics: pulsed neutron techniques (Part I)	Argentina
1060	H. Wuerz	Nuclear physics: pulsed neutron techniques (Part II)	Argentina
1061	J. Ruzicka	Development of agricultural production through the application of nuclear techniques: radiochemistry	Brazil
1062	K. Leibrecht	Maintenance of nuclear instrumentation	Turkey
1064	R. Kuoppamaeki	Radioisotopes in industry	Bulgaria
1066	S. Rao Velagapudi	Reactor metallurgy application of fracture mechanics technology	Argentina
1067	E. H. Belcher	Use of radioisotopes in medicine	Sri Lanka
1068	S. S. Kapoor	Neutron physics	Bangladesh
1069	A. B. Brill	Nuclear medicine computer applications	Argentina
1070	M. Oberhofer	Radiological protection: thermoluminescence dosimetry	Brazil
1071	G. Weber	Design of heat exchangers for nuclear uses	Argentina
1072	H. Schnauder	Design of pipework for nuclear uses	Argentina

Reference number	Name of expert	Subject	Country of assignment
1073	A. Travesi	Activation analysis ^{c/}	Chile
1074	R. A. Mueller	Design of heat exchangers for nuclear uses	Argentina
1075	R. P. Warlop	Reactor metallurgy ^{b/}	Argentina
1076	A. Mercado	Isotopes in hydrology	Brazil
1077	R. M. Feinstein	Radiobiochemistry	Argentina
1078	D. Perinic	Irradiation facilities and loops	Argentina
1079	P. Fritz	Development of agricultural production through the application of nuclear techniques: isotopes in hydrology	Brazil
1080	Y. Henis	Nuclear techniques in soil microbiology with emphasis on bean production	Brazil
1081	Z. Hlasivec	Radiation dosimetry	Costa Rica
1082	S. S. Krishnan	Neutron activation analysis	Mexico
1083	M. Branica	Nuclear materials analysis (polarographic and other electrochemical techniques)	Brazil
1085	E. W. Tilton	Disinfestation of maize by irradiation	Mexico
1086	J. R. Gat	Development of agricultural production through the application of nuclear techniques: isotopes in hydrology	Brazil
1087	H. K. Henderickx	Isotopes in animal science	Cuba
1088	W. Baehr	Radioactive waste management	Brazil
1091	E. Piesch	Personnel dosimetry	Argentina
1094/Rev. 1	E. Iranzo	Radiological protection in uranium mines and plants in the Republic of Mexico ^{c/}	Mexico

B. Technical reports emanating from UNDP-assisted projects

Recipient country	Project title	Report title	Technical report number
Greece	Exploration for uranium in Central and Eastern Macedonia and Thrace	A manual of methods used in the uranium exploration project	1
Korea, R.	Radiation processing demonstration facility	Organization of the project	1
Pakistan	Exploration for uranium in the Siwalik Sandstones, Dera Ghazi Khan District	Geochemical exploration methods	6/Rev. 1

C. Terminal reports on projects assisted by UNDP

Recipient country	Project title	Project Manager/ Chief Technical Adviser
India	Nuclear research in agriculture	L. Fredriksson

a/ The reports are available in English unless otherwise indicated. No data have been included in respect of reports whose distribution is restricted to the recipient Government.

b/ Available in French only.

c/ Available in Spanish only.

