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Report on the

Inter-Agency Mission on Impact Study on the Activities of the UN System in Science and Technology in Jordan

19 - 27 November 1989

by

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Vienna, 5 December 1989

A. INTRODUCTION

In the context of a programme spearheaded by the United Nations Centre for Science and Technology for Development (UNCSTD) to assess the impact of activities implemented by the United Nations System in the developing countries, a UN inter-agency mission was carried out in Jordan from 19 to 27 November 1989. The Mission was led by Dr. Sergio C. Trindade, Executive Director of UNCSTD. The other mission members were:

UNCSTD: Mr. C.B. RAU, Senior Scientific Affairs Officer
Ms. HAIYAN QIAN, Special Assistant to the Executive Director

ESCWA: Dr. ZEKI FATTAH, Senior Affairs Officer, Natural Resources, Science and Technology Division, Baghdad

FAO: Dr. IBRAHIM ABU-SHARR, FAO Consultant

UNESCO: Dr. OSMAN N. ABAYAZID, Senior Programme Specialist, Regional Office for Science and Technology, Cairo

UNIDO: Dr. LASZLO F. BIRITZ, UNIDO Consultant

WHO: Dr. ABDUL MEGID ABDUL HADI, WHO Regional Representative, Damascus

UNDP/Amman: Dr. MONTASER J. OKLAH, Programme Officer

The Terms of Reference of the Mission are attached as Annex I.

The work began on 19 November (Sunday) with an initial briefing session among the members of the Mission, discussing modalities, reporting and logistical matters. The formal activities of the Mission started with a briefing session with Dr. Ali Attiga, UNDP Resident Co-ordinator on 20 November (Monday) and culminated at a debriefing with him in the presence of Dr. S. Toukan, Secretary General, Ministry of Planning (MOP) and Dr. A. Toukan, Secretary General, the Higher Council for Science and Technology (HCST) on 26 November (Sunday). On 24 November (Friday) the writer accompanied Dr. Trindade and Ms. Qian to visit the JURF-AL-DARAWEESH Solar Energy Village Project. His Royal Highness, the Crown Prince, met with the Mission on 26 November (Sunday) to receive a briefing on the findings of the

Mission and to outline his thoughts on the role of S+T in Jordan. Because of this unscheduled reception, the meeting with the Ministry of Agriculture had to be postponed to 27 November (Monday). Present were only the writer and the FAO member of the Mission, as the other members of the Mission have already departed.

Due to the general nature of the Mission, observations and findings can be considered as tentative and as the personal views of the writer. Since the pre-arranged programme of the Mission could not be altered, the writer had no opportunity to obtain a picture on the state of industry in Jordan and its S+T needs. Nevertheless some issues emerged from the discussions which are clearly identified in the descriptive part.

As the work of the Mission progressed, it became obvious to the writer that for such a broad-scoped inter-agency mission to be truly effective, preparatory work (i.e. reviewing relevant background material - desk study) is essential combined with a structured approach and, if possible, preparatory field work by (some) of the members of the Mission. These ideas together with conclusions and recommendations pertaining to UNDFP involvement in S+T was prepared (in hand writing) in the form of a memorandum by the writer and given to Dr. Trindade for his perusal for the preparation of the final, formal report (prepared by UNCSTD) as well as for consideration for the implementation of such inter-agency missions in the future. The next chapter (B) is therefore this memorandum itself as it represents the writer's overall views and conclusions.

Due to the broad (horizontal) interests and involvement of the Mission, the presentation of the detailed report on the visits and discussions follows in sequential order.

B. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

(This is the text of the memorandum to the Mission Leader, Dr. S. Trindade, Executive Director, UNCSTD, referred to previously.)

In line with the overall mandate of the General Assembly, namely, to ensure the optimum application and utilization of science and technology (S+T) within the context of the overall efforts extended for their economic and social development, the Mission must address a number of interlacking issues to arrive at specific conclusions focusing on the UN System, as delineated in the Mission's Terms of Reference. The logic of the sequence of my views and comments is, I hope, obvious and needs here no further elaboration, except perhaps that, to assess the effectiveness of the UN System in Jordan, the overall (global) issue of S+T in the country's development has to be examined as the first step. In addition there are several aspects (parameters) which have to be dealt with over and above the basic issues.

1. Overall Issues

As the first step, the National Development Plan should be reviewed and, within its context, the part dealing with S+T Policy and Planning (desk study). This by itself will indicate the level of endogenous capabilities in S+T policy formulation and Planning of the country.

> In the case of Jordan, the intellectual capacity for the decision making process is certainly of very high level and adequate. Weaknesses appear to be present in co-ordination, both at the programme/project preparation stage as well as during their implementation. The establishment of the Higher Council for S+T (HCST) is aimed to remedy this recognized weakness.

The second step requires a detailed review of all S+T programmes/ projects scheduled for implementation and being implemented in the country (desk study), including those financed by the Government, bilateral and multi-lateral donors in juxtaposition to the National S+T Plan. (UNDP could be of great help in providing the required comprehensive information beforehand, including indications for financial allocation.) The purpose here would be to determine if these are in line with the Plan objectives.

In the case of Jordan, it is difficult to reach conclusions in this regard, although some indications were noted for imbalances (e.g. inadequate support to the Institute of Animal Health, although the poultry industry is of considerable relevance to national food supply, employment generation and export earnings).

Thirdly, the strategy of implementing the programmes (i.e. which project should come first and subsequently) needs to be considered.

In case of Jordan, there was no evidence that the issue was given serious thought.

Fourthly, the co-ordination among the various inputs to achieve their optimum utilization needs examination.

In case of Jordan, no evidence of a comprehensive co-ordinating effort was noticeable. Such interaction appears to result of ad-hoc, albeit logical, interaction resulting from obvious necessity (e.g. between the Institute of Animal Health and the Regional Poultry Training and Development Centre; or between the Telecommunication College and the Universities' technical faculties). Improvements are called for in this regard.

2. Sector-Specific Issues

The two specific sectors which affect all the other sectors and society as a whole, namely education and telecommunication is of critical importance.

In case of Jordan, these two sectors do receive a commensurate, high level of support, particularly education.

Of the other sectors specifically industry is of the writer's concern.

In case of Jordan, the industrial sector is not benefitting directly as much as it should from the S+T support. Support is concentrated on institution building (universities, RSS) but the technology transfer support to industry is wanting, unless industry itself is taking the initiative (e.g. Arab Pharmaceutical Company). The targeting of specific R+D efforts on behalf of industry also needs improvement.

3. Co-ordination

Co-ordination at the two critical levels, namely (a) needs assessment and strategy/programme/project formulation on the one hand and (b) programme/project implementation on the other is crucial for achieving optimum

utilization of S+T assistance for development. Optimum results can be only achieved if the entire co-ordination scope is spearheaded and controlled by the Government (e.g. South Korea). Nevertheless the UN System, specifically UNDP can be of great help. The reason is that bilateral donors have to follow their own specific priorities that only the Government can influence. Bilaterals, by definition, cannot assume a co-ordinating role. The UN System, on the other hand, again by definition, can assume such a co-ordinating role and indeed does in many countries.

In the case of Jordan, co-ordination in the field of S+T is definitely not at the level it could or should be, neither at the preparatory nor at the implementation stage. The HCST is now embarking to assume this most important function on part of the Government. Efforts on the part of UNDP should be intensified as well.

4. The UN Assistance to Jordan

Practically all UN assistance is by policy aimed at endogenous capacity building at the national-, sectoral-, institutional- and enterprise levels; only a minimal amount is capital assistance (UN CAPITAL FUND). Such endogenous capacity consists of 3 components: decision making (including analysis of the situation); co-ordination; and "housekeeping" (i.e. the performance of regular tasks, duties and functions). Generally speaking one can state, the higher the hierarchical level, the more pronounced the decision making and co-ordinating role.

In the case of Jordan, it appears that national-level policy making and planning is well established and functioning. Streamlining the mechanism for policy making, planning and co-ordination in the S+T area is underway through the establishment of the HCST, although the co-ordination function during policy and plan preparation does require further improvement. The capability at the sectoral level could not be assessed. The "housekeeping" function, which is particularly important at the institutional (and enterprise) level appears to be functioning well inspite of budgetary difficulties (Institute of Animal Health, Telecommunication College). - The UN support in the S+T area was perhaps not as extensive as could have been due mainly to funding constraints and setting of priorities. A more consciencious approach for project priorities setting is also required in the future using the "national programme" of priorities as its basis and taking into account bilateral activities to avoid duplication on the one hand and to ensure that the particular advantages of the UN System (i.e. objectivity, technical capabilities, access to the entire world for inputs, including TCDC) are used to the utmost.

5. Recommendations

The recommendations presented here fall into two categories: (a) those concerning the UN System's involvement in the S+T field in Jordan, and (b) those concerning future UNCSTD missions.

(a) The involvement of the Un System in Jordan

In line with the observations, findings and conclusion outlined previously, the following are the recommendations concerning the UN System in Jordan:

- Concentrate assistance in the policy making and programme and strategy formulation areas at the national and sectoral levels, where the objectivity and impartiality of the UN System is of utmost importance.

- Provide assistance in the area of programme formulation in general (e.g. water) and related project formulation in particular, to achieve cohesiveness, including the required co-ordination with bilateral donors, since this is the area in which the success of the National Plan stands (or fails).

- Assist in the establishment of new S+T related institutions; UN help is essential here, since bilateral donors are usually reluctant to embark on such tasks, but prefer to help existing institutions.

- Provide assistance (usually at the institutional level) where inputs from world-wide sources, including use of TCDC, are particularly valuable.

(b) Future UNCSTD Missions

Based on the experience of the present Mission, the writer feels that if the elements listed below are at least partially included in future missions, these could yield improved results:

- Carry out a desk study, as outlined previously (National Plan, goals, priorities, S+T part of the Plan, UN past and on-going inputs, etc.).

- Identify the sectors and areas of particular relevance to the country and ensure that the respective UN agencies are represented in the missions.

- Distribute the results (synopsis) of the desk study to the members of the missions.
- Introduce a specific methodology (questionnaire) to obtain the required information.

- Have the sectoral specialists carry out their preparatory investigations (one week) prior to the Mission, who then join the Mission-proper during the second week.

C. DETAILED DESCRIPTION OF VISITS AND DISCUSSIONS

1. Briefing of Mission by Dr. A. Attiga, UNDP Resident Co-ordinator

Dr. Attiga requested the Mission to concentrate on the following issues:

- Review the S+T Plan being developed and proposed by the HCST; this should be the basis of the Mission's work; resulting in identification of potential areas of technical assistance (TA) in the next Country Programme;

- Co-ordination difficulties at all levels between regional and country (as well as bilaterally funded) projects;

- Wheather the Jordanian Government/policy making bodies have established priorities in S+T development; how could UNDP assist in this regard, including the possibility of TA project(s);

- Wheather training and manpower needs related to S+T are well enough defined;

- Wheather S+T inputs are in line with demand.

2. Ministry of Planning (MOP)

(Dr. Safwan Toukan, Secretary General)

- The last National Plan had the first time a separate chapter on S+T plans and policies;

- Funding for S+T has been recently increased;

- Improving agricultural productivity is one of top priorities; particularly fruit and vegetable production as Jordan is gaining market share (from Turkey) mainly in the Gulf Region and exports are increasing;

- Agro-input industries have, to his knowledge, not been assessed as an overall, coherent basis in relation to priorities (possible need for UNIDO assistance);

- As of 1987, the HCST is responsible for the preparation of the S+T Plan of the country which, after appropriate (ministerial) review is incorporated into the National Plan by the MOP, which also allocates funding. The HCST has also the responsibility and authority to co-ordinate and follow-up at the various recipients of S+T funding (e.g. universities, the Royal Scientific Society, etc.);

- The industrial sector needs more attention as regards S+T support than it received until now, although educational support is considered adequate for this purpose.
(As Dr. Toukan was not aware of DP/JOR/87/009, I gave him a copy of the UNIDO summary for info.)

3. Higher Council for Science and Technology (HCST)
(Dr. Abdullah Toukan, Secretary General)

- The HCST, established in November 1987, is the highest level and most important body of the Government (Chairman of its board is His Royal Highness, the Crown Prince), entrusted with planning and co-ordinating responsibilities at the national level. Its staff interacts with all "stake holders" in the S+T field, including the various sectoral ministries, industry, agriculture, municipalities, universities, the RSS, etc. It has field staff to gather the required information (for the time being) and to monitor the progress of S+T activities (at a later stage).

- In addition to the usual sectoral approach, the HCST is embarking on a major programmatic approach and is developing plans in nine, for the country's development considered critical, areas, including in: technology assessment; health; water; environment; biotechnology; information; etc. The establishment of some new facilities (centres) is being planned.

- Human resources and industry are also high priority areas. The 450 small/medium-sized industries of the country need help, particularly in improving quality (possible need for UNIDO assistance). Efforts are directed towards channeling the capabilities of the country's excellent universities to assist industry.

- The problem of scientific equipment and instrument maintenance was repeatedly emphasized. (The writer gave an overview of UNIDO's activities in this field and promised to have information sent to him on the subject; possible need for UNIDO assistance.)

- The identification of meaningful, import-oriented R+D projects is still far behind the level needed for inducing/accelerating development.

- In conjunction with information, the importance of computers is fully appreciated. The establishment of a Computerization Centre is planned. (One example cited was the difficulties experienced with software arabization.)

In a subsequently organized, separate evening session, the Mission was shown in detail the scope of the work of HCST and detailed presentations were given in the following fields:

- Environment: major problems in sewage processing (possible need for UNIDO assistance); dust from the phosphate ore processing plants (possible need for UNIDO assistance); maintenance problems in the cement industry (possible need for UNIDO assistance); municipal garbage collection and disposal (possible need for UNIDO assistance); soot and corrosion problem in the electricity generating plant because of high sulfur oil (2.5%) used (possible need for UNIDO assistance).

- Establishing new industries based on the country's mineral resources: HCST will be responsible for carrying out the required pre-feasibility studies (possible need for UNIDO assistance); the country has considerable bentonite resources; (the writer advised on UNIDO's work on the use of bentonite in agriculture under arid conditions; information to be sent to HCST).

- Improving productivity/profitability in S+M industries: a key target for HCST as well (possible need for UNIDO assistance).

4. Royal Scientific Society (RSS)

(Dr. Fakradin Al-Dasastani, Adviser (former President of RSS) on behalf of Dr. Hani El-Mulki, President, who was out of the country)

The RSS has 30 specialized laboratories and a total staff of 520 of which 280 are university graduates.

- Comments on UN assistance were negative (slowness of response, administrative difficulties, etc.), although the quality of expertise and training provided was considered good.

- Direct implementation by RSS was stated as superior in every respect (e.g. the combination rural solar/wind energy project) whereby RSS employes a "project attendant" (i.e. expeditor) financed from project funds, located in the country from where most of the inputs emanate.

- The development of the solar hot water heaters manufacturing industries and the use of household solar water heaters is one of the major achievements of the RSS - over 20% of all households in Jordan have it (a total of over 100,000).

- The opinion was expressed that, UN funds being meager, these are spread too thin in too many areas and thus lose their impact. Should be concentrated instead in fewer, major projects in critical, essential areas.

5. Building Research Centre (RSS)

These are well equipped laboratories (UNFSTD project) with the capability to test all types of building materials as well as to carry out development work and carry out soil testing. There is an architectural department involved in settlement planning and restoration of antique buildings. Just stating to establish a unit for earthquake-resistant construction methods. After mentioning UNIDO's work in this field, requested that UNIDO provides information on the subject.

6. Solar Energy Research Centre (RSS)
(Dr. Eng. Rizeq Ta'ani, Director)

- A (finally successful) UNIDO project, with many initial problems and misunderstandings encountered during implementation. It is now self-supporting through FRG funding in the form of contract research (results are used by FRG in other countries), with a staff of 32, including 22 university graduates; research concentrated on: solar energy for water heating; photovoltaic/wind energy for water pumping; photovoltaic use in remote areas.

- Wide use of solar water heaters in Jordan the result of the Centre's work, as there were none in use in 1972, when the Centre was established. Although it is estimated that only 4% of the country's total energy needs can be eventually covered from solar/wind energy, the social benefit of the project is substantial by considerably improving directly the quality of life of a large part of the population (i.e. abundant quantity of hot water; electricity in remote areas).

7. Faculty of Medicine, University of Jordan
(Prof. Musleh Tarawneh, Dean)

- The Cytogenic Laboratory and the Ophtalmic Centre were visited, both established with UN (WHO) assistance and operating as expected.

- The problem of maintenance and repair of medical equipment was stressed, which is prevalent in the entire country (possible need for UNIDO assistance). A centre for this purpose is planned with the prospect of Japanese founding.

8. Royal Geographic Centre
(Dr. Eng. Oglah D'haimat, Director)

- Project implementation was held back by equipment delivery delays (local representative holding back to increase profits due to inflation).

- The Centre is now almost fully digitalized and is providing specialized maps to all Government departments as well as the private sector.

- Although equipment/instrument maintenance is well organized, serious electronic/computer-related problems require assistance from outside the country.

9. Institute of Animal Health
(Dr. Ahmad Al-Ajlouni, Director)

- The Institute was established in 1968 with UN assistance (FAO), but is now in dire need for upgrading the facilities and equipment in view of the economic importance of animal raising (mainly poultry, with about 30 million chicken population and increasing exports). Recent assistance comes from the FRG, but much more is needed!

- The Institute provides services to small farmers as well as large, commercial operations and also tests imported animal feed (chicken) for absence of biological contamination.

- Shortage of trained, experienced technicians is a major impediment (as in almost every institution), although professional/university graduate/resources are adequate;

- There is no meaningful library and provision of current literature is completely absent due to budgetary restrictions;

- Maintenance and repair of equipment and instruments here is a major problem (possible need for UNIDO assistance).

10. Ministry of Health (WHO project)

- The assistance provided through WHO was greatly appreciated. The responsibilities of the Ministry lies solely in the primary health care area; hospitals fall under the Medical Institute of Jordan. Health care-related regulatory legislation is a major function of the Ministry. The ministry also operates rural health care units.

- The main need is in staff training (technical level) and in instrument repair and maintenance services (possible need for UNIDO assistance).

11. Ministry of Education (MOE)
(Dr. Munther Al-Masri, Secretary General)

This was one of the most interesting discussions, in the opinion of the writer, held by the Mission. The educational system of Jordan and particularly the changes being introduced are so unique that these deserve a concise description.

- Basic education only is the responsibility of the MOE, which is compulsory and free, lasting 12 years (ages 6 to 18), where the first 10 years are general and the last 2 years specialized, with English being compulsory. University education falls under the Ministry of Higher Education while vocational training in 6 fields is the function of the Vocational Training Corporation with its own Board of Directors comprised of representatives of the sectoral ministries (i.e. Labor, Health, Industry, Agriculture, etc.), industry and other concerned bodies.

- Since two years a new system is being put into effect, with the following three main features: (a) put more emphasis on the practical aspects of education (every subject has practical components, even history!); (b) vocational activities are mandatory at all levels (handicraft skills at the low grades, and 4 hours/week of vocational training during the last year); (c) computer literacy training in the last (10th) year.

- The new law mandates that all teachers must have university education/degree (which is presently not the case, but is being corrected through mandatory continuous training of teachers).

- The country has 20,000 teachers in basic education, 1/3 already with university degree.

- Teachers receive "special allowances" over and above normal civil-service grade remuneration as inducement for teaching in the country-side.

- During the last 4 years of basic education students receive counseling on choosing a profession; students in their last year must fill out a form describing their career or further educational aspirations.

- 70% of those who complete basic education go on to secondary (university/college) education; the new law aimes to bring the ratio to 50|50 by the year 2000.

- Since during vocational training the students must work 1/2 time in industry, the Vocational Training Centre finds placement for aspiring trainees (apprentices), whereby industry can participate in choosing from candidates, but cannot fire trainees during the 2 years training period except for grave causes.

- The World Bank has been continuously involved in Jordan's educational development (now Phase 7), mainly for providing funding for school construction and equipment/supplies, although part of the loan is used for training and expertise as well.

- Most of the standard school furniture is made and supplied by Jordanian manufacturers, although international competitive bidding is mandatory.

- Inspite of the recent financial crunch, the budget for education has not been curtailed.

12. Regional Poultry Training and Development Centre (FAO project, financed by Italy)
(Dr. Abdul Karim Al-Khazraji, Director and Project Manager)

- The Centre has trained about 400 persons since its inception, 80% from other countries of the Region.

- Training in all aspects of poultry raising is provided.

- Most of the consultancy, trouble-shooting and testing services, however, are for Jordanian clients (Government and private).

- The Centre co-operates closely with the Institute of Animal Health.

- A review of abattoirs in the country to explore if by-products could be economically processed for animal (chicken) feed might be worthwhile (possible need for UNIDO assistance).

13. Commission of the EEC in Jordan
(Dr. Falkowski, Director)

- Jordan is considered by the EEC as a Mediterranean country, and hence it receives support in the form of loans and grants. The present 5-year "protocol" (1987-91) foresees 100 million ECU's, of which 63 million in loan and the rest grants, all in the S+T and human resources development areas, which are the EEC's priorities.

- Past EEC support had particularly large impact on the development of Jordan and Yarmuk universities and the RSS.

- University teaching capabilities are very good, but research capacity is lacking (meaningful, practically-oriented research ideas and projects).

- Communication between faculty and the various sectoral ministries is sparse.

- Supporting technician staff is insufficient and not motivated (due to low remuneration).

- Educational preparation students in the S+T fields is very good and they do very well studying abroad; preparation for carrying out research is weak.

- EEC is now negotiating with the HCST the financing of specific, practically-oriented research projects at the universities, which must be applicable to the country, not duplicate research carried out elsewhere and be commensurate with the research capabilities of the universities.

- There is little co-operation between EEC and UN activities and the EEC Commissioner is unfamiliar with UN activities.

- Presently UNDP collects the information from all donors and puts it into a "book", but it stops here. Starting a true dialogue between the donors (spearheaded by the UNDP Resident Co-ordinator) could be most fruitful - assuming the Government has no objection to such a dialogue.

14. Arab Pharmaceutical Company (APC)
(Dr. Ma'an Shuqair, General Manager)

- APC was started in 1962 with 12 employees and now has 1,000; sales of US$ 35 million, of which 80% from exports to Arab countries and Africa; hopes to start exporting soon to Europe some unique formulation. (Note: Jordan has 4 other pharmaceutical companies with total sales of about US$ 50 million and 500 employees.) Local companies cover about 30% of the Jordanian market, with APC's share being about 20%. APC is particularly well positioned in the Arab countries.

- APC does minimal licensing, only 2-3 out of a total of about 150 products. Presently makes only formulated (proprietory) products using imported raw materials, but with a staff of 25 involved in "true" R+D, they are on the verge of developing products based on in-house-developed chemistry. They are slowly changing into a "science-driven" company from a purely "market-driven" one. For this purpose APC co-operates closely with Jordanian universities where it sponsors several research projects which are reaching the stage to apply for foreign patents, including in the USA. Research work is carried out to utilize local plants for medicinal purposes.

- APC utilizes the services of a number of internationally renown specialists on a consultancy/retainer basis and is doing everything on its own, and has never received any assistance from any outside sources (UN, RSS, WB, etc.).

- Basically, APC has "endogenous" capacity in S+T, except perhaps related to information, such as finding supply of specific raw materials, technologies, expertise, etc.

- Heavy emphasis is placed on continuous training activities within the company at all levels. There are no maintenance problems.

- APC does not produce veterinary pharmaceuticals, but some of the other companies do. But no R+D is carried out in this field whatsoever in the country. (Note: a Faculty for Veterinary Medicine was started this year at Jordan University.)

- APC does not produce any packaging materials and other supplies it uses, but purchases these from the outside, much of it produced in Jordan. Co-operates in this respect with local suppliers.

- The criticism concerning Government policy and related recommendations can be summarized as follows:

  a) the "general development" approach of the Government practiced in the 1970's (why agriculture if there is no water? tourism will certainly not solve the country's problems) should be refocused on specific goals;

  b) for Jordan to survive, technological development is the answer;

  c) Government S+T support to industry should be increased and sound priorities set, based on their potential economic impact;

  d) taxation policy should be reviewed and refined; incentives for industry to carry out R+D should be introduced (presently this is not the case);

  e) introduce policies and incentives to promote industry to utilize the R+D capabilities by universities and vice-versa; and tying-in industry with other S+T institutions in an essential precondition for accelerating growth and development.

15. Telecommunications College

(Mr. Khaleel Abu-Rizeq, Director)

- Established in 1974 with UN assistance (ITU), the College is an integral part of the Telecommunications Corporation. Until recently, all assistance received was exclusively from the UN System. The laboratories are being now up-graded with assistance from Finnland.

- All instructors are nationals and students from other countries are also being trained here.

- There is a prevailing weakness in the entire Corporation for making "endogenous" decisions regarding the acquisitions of new technologies and telecommunication systems.

16. Visit to the Rural Solar/Wind Energy Project in Jurf-Al-Daraweesh

- The project, executed by RSS was partially financed by UNDP. The combined solar panels/wind combination power generation, coupled with a battery-storage system and governed by an automatic control system, works very well and it serves a village of 700 inhabitants through a local, closed grid. Electricity is charged at the same rate as in Amman.

- A nearby wind powered water pumping station (55 m depth) provides water not only for the village, but also for grazing animals in the area.

- Competitiveness of the system with standalone diesel generating systems depends mainly on solar cell costs/economics to which the lower maintenance costs of the solar/wind systems have to be also added as well its greater reliability.

- For expansion, the solar energy is priority, because the highest electricity consumption occurs in the winter months when wind prevalence is lowest.

17. Industrial Development Bank (IDP)

(Dr. Taher Kanaan, General Manager - former Minister, Ministry of Planning)

(As an opener, Dr. Kanaan expressed the views that the task of the Mission is almost "impossible" or at least very difficult without preceeding thorough, in-depth preparation.)

- The IDB provides loans for industrial and touristic development. (Agro-institutions are the responsibility of the Agricultural Credit Corporation, but is does not get there proper attention and the IDB is trying to bring it under its domain.)

- IDB's interaction with the UN System is minimal; some short-term experts/consultants (e.g. foundry expert) provided through on-going project (DP/JOR/87/009); and some through the World Bank. Most co-operation is with bilateral agencies.

- Quality of UN-provided expertise usually below expectations, but not worse than expertise provided through bi-lateral channels - except the FRG, whose experts are considered the best.

- The IDB has equity interest in two recently established Jordanian venture capital groups and is in this field co-operating with the European Development Bank.

- The IDB carries out its own (pre)feasibility studies using its own method, but some of its staff is familiar with COMFAR and have participated in COMFAR seminars. (Nevertheless they would like to obtain COMFAR for their use as well.)

- The Bank provides advice to loan applicants on where to obtain technology, selection and purchase of equipment, marketing, management, etc.

- In addition to projects proposed by loan applicants, the Bank also promotes/finances projects initiated by the Bank itself and usually takes equity interest in these.

- The IDB continuously monitors the performance of enterprises it has financed. About 25% of the loans are not payed back on schedule and most of this by a relatively small number of projects for which the IDB has a special "Problem Project Unit" which deals exclusively with these investments.

- Larger size enterprises generally are doing well in Jordan as these have the required management skills available; problem projects mainly occur in small- and medium-sized (S+M) industries.

- The Jordan Management Institute (located next to the Bank) provides and conducts courses in management. The IDB itself provides consultancy services through it subsidiary, Marketing and Manufacturing Improvement Services (partially financed by USAID).

- Dr. Kanaan stated that, according to his experience, short-term consultants are of better quality than long-term experts, because the former can be released by their employers, where they are up-to-date in their field of specialization, and where they can return after completion of their assignments.

18. Department of Statistics
(Dr. Abdul Hadi Alaween, Director)

- This is the central statistical unit of the Government, covering the entire country. It has until recently concentrated on demographic statistics (UN assistance); emphasis is now on economic statistics (FRG assistance). - The short-term services of a specialist in industrial statistics are required (possible need for UNIDO assistance).

- UN assistance was strongly criticized for its slow response, long delays and cumbersome administrative procedures.

19. Civil Aviation College

(Mr. Abdul Razak Al-Wishah, Director)

- The College was established in 1972 with UN assistance (ITU). The assistance given by the UN and continued co-operation with ITU was considered excellent. The equipment is good and is continuously up-graded.

- Training duration is 2 years; all instructors are nationals; thus for 1,700 trainees received instruction, many from outside Jordan.

- The trainers receive continuous up-grading training themselves (abroad) and the services of short-term consultants are also utilized.

20. Department of Lands and Surveys

(Mr. Husem Azar, Director, Statistics and Public Relations Section)

The UN provided assistance did not yield the desired results because of the expertise provided, whereby language problems (French-speaking expert; Jordan's "second language" is Arabic) were the root of the problems, since perfect knowledge of the language is essential as landownership is registered by name (alphabetical registration). The expert was not able to familiarize the (field) staff with the excellent new technologies in this field.

21. Meeting with His Royal Highness, the Crown Prince

This was an important meeting, because the Crown Prince was and is deeply involved with S+T development and is the Chairman of the Board of the HCST. After briefing by the Mission Leader, the Crown Prince gave his views to the Mission, the salient points of which were:

- S+T policy-making capability is not at the desired level in Jordan.

- Self-preservation is still the priority of bureaucracies instead of concentrating on the optimum utilization of resources (as in many other countries).

- Changes in S+T thinking should come by conviction and not by decree.

- The crucial role of information in S+T development at all levels and in all its dimensions (within country, external, on technology, etc.) is one of the main concern of the Government.

- Overall planning, and within its context S+T planning, is extremely difficult in the current demographic changes (people moving in and out of the country as the result of economic changes in the Region; a ten-fold increase in the population since 1948).

- Growth should be achieved in a "controlled environment and in the context of regionalization (within the country); this is essential for slowing down urbanization and the "dying of the country-side".

- Agricultural development is essential in this regard, but there are no truly interested "stake holders" for the optimum application of S+T in agriculture.

- Generally speaking, identifying and educating the S+T "stake holders" in general is the area where the UN could be of greatest assistance.

- The country is now embarking on a major programme in the S+T area (HCST) and hopes to avoid overlaps. Industry is of high priority.

22. Debriefing with the UNDP Resident Representative
(In addition to UNDP staff, Dr. S. Toukan, Secretary General, MOP and Dr. A. Toukan, Secretary General HCST, were also present.)

Dr. Trindade presented the overall findings of the Mission as follows (verbatim):

- Make the ECD (endogenous capacity development) dimension explicit in policy, programmes and projects and promote national execution of UN activities.

- Support the role of the UN Resident Co-ordinator in S+T for development, including multi- and bi-lateral co-ordination, in close contact with the MOP and HCST as frequently as possible.

- Focus the Country Programme on relevant S+T programmes, emphasizing ECD and a programmatic approach.

In the following discussion Dr. S. Toukan stressed the need for improving Government policy and co-ordination.

23. Ministry of Agriculture
(Dr. Sami El-Sunna, Secretary General)

(Note: Because of the meeting with HRH the Crown Prince, this meeting took place on Monday, 27 November; present were only the writer and the FAO representative as the other members of the Mission have already departed.)

- The success in agriculture will depend on the availability of in S+T trained, skilled manpower.

- Local, indigenous technologies and methods should be emphasized and developed further, but the country lacks the researchers for this purpose, since past training (assisted by the UN) concentrated on general agricultural training, while the development of specialists (e.g. genetics, stock breeding, etc.) was not sufficiently emphasized; the UN could and should do more in this respect.

- A "Bioengineering Centre" for agriculture solely is needed to serve all developing countries. (The writer advised on the Centres in Trieste and New Delhi; Dr. El-Sunna requested detailed information.)

- In Summary, the S+T research capacity in agriculture is missing. For this reason the Government is embarking on a major programme to increase the capabilities of the National Centre for Agricultural Research and Transfer of Technology (NCARTT) with a US$ 16 million expansion programme (US$ 3 millions for equipment).

- The state of agro-input industries in the country deserves a thorough review and assessment (possible need for UNIDO assistance).

(0742h)

ANNEX I
17 November 1989

Terms of Reference for the Inter-Agency Mission to Jordan

Background

The ACC Task Force at its eighth session, decided to shift the focus of its future work towards specific country situations and, in line with this approach, to initiate country reviews on the impact of the United Nations system's activities on the development of endogenous capacity in science and technology. The first inter-agency mission was undertaken in Thailand from 5 to 9 December 1988. As a result, a concrete follow-up project was formulated by the mission and submitted to the Government of Thailand and UNDP for inclusion in the country programme. The report of the inter-agency mission and the follow-up project were also reviewed by the ACC Task Force at its tenth session held in March 1989. The Task Force decided to launch the next missions to Nepal during 5-9 November and Jordan from 20-26 November 1989.

Context

Jordan is a small country which occupies a strategic position in the Middle East. While Jordan is not particularly well-endowed in known natural resources, it has some of the most highly educated and skilled but mismatched human resources in the Arab world. In terms of literacy, Jordan enjoys one of the highest rates of over sixty per cent literacy among adults. In this sense, its most precious resource and exportable resource is its educated and well-trained people. Jordan receives significant aid from other Arab states. The shortfall in the receipt of external aid has resulted in a serious economic crisis. There is growing realization that Jordan has to reduce its dependence on external aid and enhance its own internal growth and development by maximizing its strengths and concentrating on a few critical areas of resources. Among natural resources, Jordan has rich phosphate deposits. The challenge facing Jordan is to accelerate its economic growth in the face of meagre natural resources, limited market, rising population and volatile

external environment. In this perspective, Jordan has come to attach considerable importance to building its scientific and technological capacities and, as a major institutional step in this direction, established a Higher Council for Science and Technology under the direct supervision of His Royal Highness Crown Prince of Jordan. The time thus is opportune to review the impact of the activities of the United Nations system in science and technology and to launch an inter-agency mission.

United Nations assistance to Jordan

According to the study commissioned by the Centre on the impact of UN assistance in science and technology for development, the total sum of funds allocated to technical assistance and received by Jordan from all United Nations organizations over the period 1980-88 came to US$54.3 million. (This cannot be considered as all inclusive and comprehensive since some of the activities of organizations like IBRD, WMO, ILO etc. are not included.)

Jordan received technical assistance from outside the United Nations system of about US$205 million over the same period. This support was extended by about 20 bilateral and multilateral donors, the leading bilateral donor country being the Federal Republic of Germany whose technical co-operation support totalled US$86 million. The study commissioned by CSTD makes a critical analysis of the impact of the United Nations system's activities in science and technology based on some rational criteria, provides a very useful basis for the mission.

Terms of reference of the mission

The following could constitute the broad terms of reference:

1. To identify what specifically needs to be done to bring about closer linkage, on one hand, among the components of the United Nations common system (e.g. FAO, UNESCO, UNIDO, WHO etc.) and, on the other, the various ministries in Jordan dealing with science and technology (e.g. Ministry of Agriculture, Ministry of Education, Ministry of Industry, Ministry of Health etc.)?

2. To delineate, from the perspective of the above two-combs approach, what needs to be done to facilitate closer coherence and co-operation between the United Nations system as a whole, on one hand, and the recipient organization in Jordan, on the other? And in this respect, what should be done, if anything, to strengthen the role of the Higher Council for Science and Technology of Jordan?

3. To review the extent to which the United Nations system's activities in science and technology significantly contribute to the process of building the endogenous capacity of Jordan and to identify any additional measures that might be required;

4. To review, in the light of the wide range of activities undertaken by the United Nations system as a whole, the scope, if any, for further harmonization among the various core activities so as to better target the available resources on fewer priority areas; to consider how the United Nations system can play a stronger catalytic role in Jordan in science and technology so as to optimize its contribution to the development of the critical areas of Jordanian development and what changes, if any, may be required in the policies and procedures to bring this about; to consider the modalities for closer inter-agency co-operation at the country level and to strengthen the role of the UNDP Resident Co-ordinator in the light of the consultant's report that there is a need to enhance co-ordination of the United Nations system's activities in Jordan;

5. To review the scope to facilitate greater co-operation at the programme and project levels between development co-operation activities funded by different external sources (bilateral and multilateral);

6. To formulate concrete proposals/project on effective follow-up to the visit of the mission in a manner that provides continuing System-wide response to the fulfilment of the future needs of Jordan in science and technology. To examine how could the stakeholders' dialogue project benefit from this inter-agency mission.