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PREPARATORY COMMITTEE FOR THE UNITED
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PRELIMINARY DRAFT PROGRAMME OF ACTION
(Rearranged as required by the Preparatory Committee in
resolution 6 (III))

Note by the Secretary-General of the Conference

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INTRODUCTION

At its third session, the Preparatory Committee for the Conference considered the preliminary draft programme of action (A/CONF.81/PC.21) prepared in accordance with a request from the General Assembly at its resumed thirty-third session (see General Assembly resolution 33/192) and based on an analysis of information contained in documents A/33/303/Rev.1 and A/33/303/Add.1 and 2.

After consideration of the preliminary draft programme of action, the Preparatory Committee adopted resolution 6 (III), 1/ in which it requested the Secretary-General of the Conference "taking into account the statements made by delegations on the structure of the draft programme of action, to rearrange document A/CONF.81/PC.21 and to submit it to Member States not later than six weeks before the fourth session of the Preparatory Committee". The Preparatory Committee re-emphasized that the programme of action for the Conference should be a contribution to the establishment of the New International Economic Order. It should thus prescribe action-oriented recommendations aimed at the use of science and technology in pursuing development within the objectives of the New International Economic Order, as defined by the pertinent resolutions of the General Assembly, mainly resolutions 3201 (S-VI) and 3202 (S-VI) of 1 May 1974, 3281 (XXIX) of 12 December 1974, and 3362 (S-VII) of 16 September 1975.

The objectives of the New International Economic Order are based on equity, interdependence, common interest and co-operation, within the framework of balanced relations in accordance with the needs and interests of all countries, particularly the developing countries. The New International Economic Order is designed to correct inequalities, redress injustice, eliminate the widening gap between the developed and developing countries, accelerate economic and social development and ensure peace.

As far as science and technology are concerned, the New International Economic Order should ensure:

(a) The co-operation of developed and developing countries in the establishment, strengthening and development of the scientific and technological infrastructures of developing countries;

(b) The significant expansion of the assistance of developed countries in direct support of the scientific and technological programmes of the developing countries, in accordance with feasible targets to be agreed upon;

(c) The substantial increase of the proportion of the research and development in developed countries devoted to the specific problems of primary

1/ Official Records of the General Assembly, Thirty-fourth Session, Supplement No. 43 (A/34/43), annex I.

interest to developing countries and to the creation of suitable indigenous technology, also in accordance with feasible targets to be agreed upon;

(d) The expansion of international co-operation on the basis of principles and regulations designed to adjust the scientific and technological relationships among States in a manner compatible with the special requirements and interests of developing countries, especially in the transfer of technology.

So far, these purposes do not differ greatly from those presented in paragraphs 60-64 of the International Development Strategy for the Second United Nations Development Decade (General Assembly resolution 2626 (XXV) of 24 October 1970), which is still fully in force.

It must be noted, however, that the scientific and technological aspects of the New International Economic Order that are directly relevant to the Conference itself, and are further detailed in resolutions, decisions and recommendations, contain such new approaches as:

(a) Pursuing international co-operation in the solution of global problems that cut across frontiers and demand planetary thinking, especially in view of the world's finite nature and the increased pressures upon its resources and environment;

(b) Recognizing that these over-all global objectives need to be broken down in order to give special attention to the goals and strategies of developing countries;

(c) Calling upon science and technology to play a more direct and important role in the process of stimulating development and reducing inequalities at the international level as well as within regions and countries;

(d) Extending the benefits of scientific and technological advances beyond a few privileged sectors to the entire population, including both rural and urban areas that have so far not shared in the process of economic growth;

(e) Understanding science and technology not as independent instruments of action but as components of the over-all development process, involving internal as well as international shifts and structural changes;

(f) Recognizing the specificity and diversity of the development process, in line with the characteristics of each country not only in the field of production and over-all economic growth but also in the political, social, environmental, cultural and psychological areas, including quality of life, individual freedom and security and peace;

(g) While maintaining the ideology of "filling the gap" (on a principle that assumes a new meaning in the context of diversification), striving mainly for the creation of indigenous technologies corresponding to original forms of development based on self-reliance and endogenous growth;

(h) Stimulating relations among developing countries as a prerequisite to the achievement of collective self-reliance in order to consolidate national efforts and eliminate dependence;

(i) Emphasizing the generation of the necessary political will and means of action in order to involve developing countries, developed countries and international organizations in the necessary endeavour to realize, in a spirit of true co-operation, the required internal and international conditions for the implementation of the New International Economic Order. The basic task of the Conference is precisely to identify such conditions and determine the specific actions needed to realize them.

The preliminary draft programme of action (A/CONF.81/PC.21) was organized under the following headings:

Target area I - Sharing of knowledge and experience by all members of the international community;

Target area II - Increasing the capability of policy-making in science and technology in the framework of general development planning;

Target area III - Transfer of technology for the benefit of development;

Target area IV - Enhancing endogenous capabilities in a context of national self-reliance;

Target area V - Promoting collective self-reliance through co-operation among developing countries;

Target area VI - Strengthening the role of the United Nations in the field of science and technology co-operation.

The present preliminary draft programme of action has been rearranged into three target areas, bearing in mind the statements made by delegates at the third session of the Preparatory Committee.

Target area A - Strengthening the scientific and technological capacities of developing countries;

Target area B - Restructuring the existing pattern of international scientific and technological relations;

Target area C - Strengthening the role of the United Nations in the field of science and technology and the provision of increased financial resources.

The correlation between the target areas in document A/CONF.81/PC.21 and those in the present document is broadly as follows:

Target area A	Target areas II, IV and V
Target area B	Target areas I and III
Target area C	Target area VI

The recommendations under each target area have been grouped into the following categories, having regard to the action required for their implementation: developing countries; subregional and regional; developed countries; interregional and international.

In accordance with the terms of the Preparatory Committee's resolution 6 (III), the present document consists basically of a rearrangement of the preliminary draft programme of action (A/CONF.81/PC.21). There has been some editing of a few recommendations to clarify the text and a small number of recommendations arising from regional reports, not originally included in A/CONF.81/PC.21, have been added.

In preparing document A/CONF.81/PC.21, the Secretary-General of the Conference had invited the organizations of the United Nations system jointly to contribute to it a section dealing with their activities, and the principles on which co-operation among them is based, in relation to the six target areas used. This material which is to be found in the section of that document entitled "Contribution invited from the organizations of the United Nations system", was elaborated in a statement made on behalf of the organizations by the Assistant Director-General for Science of UNESCO. The information has not therefore been repeated in the present document.

Obviously, not all recommendations formulated at the national and regional levels were explicitly incorporated in A/CONF.81/PC.21 and hence not all appear in the present document. Recommendations of a strictly sectoral nature, or specific to the problems of a single region, or not wholly action-oriented, have not been included. Many of these will be suitable for sectoral or regional action programmes. In addition, the formulation of a preliminary draft programme has required choices in order to arrive at a coherent conceptual and theoretical framework. It is the prerogative of the Preparatory Committee to review these choices and take final decisions.

The concepts in the present paper are consistent with those that emerged in the general debates at the second 2/ and third 3/ sessions of the Preparatory Committee and the ideas advanced in statements by the Secretary-General of the Conference (A/CONF.81/PC/L.2 and DPI/DESI/NOTE/492).

2/ Ibid., Thirty-third Session, Supplement No. 43 (A/33/43), chap. II, paras. 17-40.

3/ Ibid., Thirty-fourth Session, Supplement No. 43 (A/34/43), chap. II, paras. 24-40.

TARGET AREA A

STRENGTHENING THE SCIENTIFIC AND TECHNOLOGICAL
CAPACITIES OF DEVELOPING COUNTRIES

Introduction

For well-known historical reasons, the generation of knowledge in recent centuries has been predominantly concentrated in a few geographical centres. The diffusion of technological knowledge from these centres to the rest of the world has been limited, with the result that the participation of the developing countries in the production of knowledge has been seriously impeded. As a result, much of the knowledge so produced is irrelevant, inadequate or even harmful for the developing countries, and a situation of monopoly by developed countries and their enterprises and of dependency by developing countries has been reached. Even the present increase in industrialization in certain developing countries, involving a new international distribution of labour and products, has not been matched by a corresponding international sharing of technology generation.

The technological transformation of developing countries requires a greatly strengthened capacity for autonomous decision-making on the choice and use of technologies most relevant to a country's economic and social needs. It involves an increasing capacity to control the acquisition and utilization of foreign technologies and to innovate indigenous technological solutions to a country's economic and social problems.

While under hypothetical conditions of international harmony and division of labour, it might be theoretically possible for a country to develop solely on the basis of transfer of technology, in practice any country wishing to preserve its own personality and dependence should have its own capacity to innovate. The absence of such a capacity would prevent it from attaining the necessary degree of self-reliance needed for its national security, and maintain it permanently in the group of "have-not" countries. In addition, this absence would militate against the country's long-term development and would preclude its entering the world market for industrial and semi-industrial products as a significant competitor.

The full recognition of the necessity for all countries to rely on their own endogenous scientific and technological capabilities has characterized the preparatory activities for the United Nations Conference on Science and Technology for Development. Such self-reliance does not mean autarky but the ability, in essence, to take and implement autonomous decisions for the solution of national problems. While such long-term policies to attain self-reliance may involve substantial sacrifices, they provide the only path to true independence in harmony with the country's national cultural heritage.

Many countries during the preparations for the Conference have been conscious of the need to restore to cultures that have become passive or imitative a capacity for creation and innovation; to avoid uses of scarce human and material resources in creating new needs rather than satisfying existing ones; to reach the threshold

from which their knowledge and resources will enable them to grow and transcend dependency; and to establish a balance between more costly long-term programmes with multiplying effects in the field of employment, training and short-term or prestigious projects, which may often turn out to be short-lived or controversial in their results.

Any strategy to deal with these issues would involve three aspects: strengthening national capacity or "supply"; stimulating national demand; and linking the country with the international scientific and technological system. Developing countries have hitherto concentrated almost exclusively on the "supply" aspect. Efforts have generally been concentrated on improving human resources, strengthening research institutions and providing machinery for scientific and technological information. The assumption has been that the demand for science and technology would automatically emerge from the productive system without any government action. Government action to strengthen the demand on the national science and technology system should therefore offer a promising basis for progress.

An essential prerequisite for the effective application of science and technology to development is the formulation of a comprehensive and coherent national science and technology policy designed as part of the national plan to contribute to the achievement of a country's development objectives. Such a policy would be a visible expression of the country's desire to shape its own destiny, through a voluntary and consciously determined direction of its own development. The policy should create or reinforce in each country an autonomous decision-making capacity in scientific and technological matters in accordance with requirements stemming from the realities of its political and social situation and its aspirations for the future.

Science and technology policies should be viewed as an integrated set of guidelines, action plans and organizational arrangements in the framework of which each country intends to undertake to apply science and technology in its economic, social, cultural and political context to the achievement of its goals and development objectives. The policies should be based on a process of participation by all sectors of society and should not be an esoteric undertaking. While the specific organizational structure for science and technology policy-making in each country will depend on its political, economic and social system, some general guidance on its functions and framework is available in the practical experience of many countries and for this reason the international exchange of experience is essential.

The formulation of science and technology policies, it must be recognized, is the prerogative of individual Governments. The science and technology policy of developing countries should, in particular, provide for the identification of priority areas in which endogenous scientific and technological development is required for achieving the chosen strategy for development. It should be concerned with both the generation and development of endogenous technologies and also the adoption, assimilation and absorption of imported technologies. Such a policy should aim at optimizing the national human and material endowments in relation to the magnitude of their needs and in reinforcing its capacity to innovate.

The critical role of financial resources in science and technology policy-making and in the strengthening of endogenous capacities needs to be recognized. The scarcity of financial resources in developing countries often results in a resource allocation for science and technology far below the critical level required to achieve the desired results. While there is a clear need for improved planning and optimization in the allocation and utilization of financial resources for development, the margin of flexibility available to many developing countries is severely limited in the light of the paucity of resources available. Mechanisms need to be established to augment the quantum and improve conditions for the transfer of financial resources for science and technology in developing countries. The developed countries and the international financial institutions can play a significant supplementary role.

Recommendations

Developing countries

Science and technology policy and planning

A.1. The Government of each developing country should, as a manifestation of its political commitment to the application of science and technology to development, formulate a national policy for the application of science and technology.

A.2. The formulation of a science and technology policy should be a coherent process, which involves carrying out certain essential responsibilities such as the planning, budgeting, management, co-ordination, stimulation and execution of scientific and technological activities relevant to defined development objectives. It implies also ensuring co-ordination and bringing about careful and deliberate interaction between factors responsible for growth and transformation. The national development plans and strategies should explicitly include the science and technology variable.

A.3. A science and technology policy having short-term, medium-term and long-term strategies should embrace the following:

(a) Determination of scientific and technological priorities arising from national development objectives;

(b) Survey of the available national resources and science and technology potential: manpower, physical facilities, financial resources;

(c) Formulation of science and technology plans;

(d) Management of the local demand for technology;

(e) Dissemination of the nationally existing stock of technology;

(f) Implementation of science and technology plans and their corresponding programmes, and their continued review, appraisal and adjustment at the macro and micro level.

/...

A.4. In order to strengthen the capacity for policy-making in science and technology and at the same time to increase its effectiveness, maximum attention should be given to sectors of national priority. This presupposes the following measures:

- (a) Identification of the main science and technology sectors or areas in development planning on which resources should be concentrated;
- (b) Survey of the state of the art in each science and technology sector to identify potential exploitable areas;
- (c) Critical assessment of facilities that can be used in developing a given sector;
- (d) Establishment of short-term and long-term quantitative and qualitative targets for each sector;
- (e) Formulation of scientific and technological policy for each sector indicating possible uses of existing technology, its adaptation or the need to import new technology;
- (f) Short-term and long-term training of staff;
- (g) Critical evaluation of how each sector can contribute to the development of other sectors and in the formulation of intersectoral programmes of work;
- (h) Identification of existing or development of new policy instruments to implement the science and technology plans.

A.5. Technology policies of developing countries should provide for a technological mix ranging from the most advanced sophisticated technologies to the traditional. Their efforts should be to arrive at an optimum combination of the most advanced and non-capital intensive technologies, in a country-specific, resource-specific and product-specific pattern.

A.6. Each country should:

- (a) Establish a national authority for science and technology policy-making and implementation at the highest possible political level. It should have intimate linkages not only with research and development, but also with the mechanisms for regulating the acquisition of foreign technology, with science and technology information services and with the sources of funding.
- (b) Consider the establishment of a broadly based national council for science and technology (NCST) consisting of high-level representatives of different sectors, including the directors of all the research and development institutions in the country, members of the concerned departments of the Government, representatives of universities, professional associations, trade unions, entrepreneurs, non-governmental organizations and the like. Its functions should be:

/...

- (i) To advise on the objectives of science and technology activities;
- (ii) To secure funds and distribute them to the various science and technology institutions in the light of national development priorities;
- (iii) To co-ordinate the activities of science and technology institutions and to ensure close linkages with the productive sector and with development objectives;
- (iv) To develop regional and international co-operation in science and technology.

A.7. Each country should also supplement the institutional mechanisms by the necessary legal instruments and financial resources so as to ensure realistic policy-making, planning and programming.

A.8. In formulating science and technology strategies and plans, countries should ensure their full integration into the over-all process of national development planning. In particular, science and technology policy should be made compatible with fiscal, manpower, investment, taxation and distribution-of-income policies, harmonizing the short-term needs as well as long-term imperatives.

A.9. Bodies responsible for science and technology policy should have close working relationships with the authorities managing and planning social and economic development, particularly to ensure the integration of science and technology in development programmes and to prevent science and technology efforts from being isolated from or out of step with other national development activities.

A.10. The harmonization and consolidation of science and technology policy should be essentially the responsibility and the prerogative of Governments.

A.11. Although science and technology policy is primarily the responsibility of the State, during its elaboration and implementation there should be a social debate and interaction between the Government, the producers of knowledge and its users. This debate should create public awareness for support of the science and technology policy and should make all society feel itself to be a part of the national effort.

A.12. Countries should take specific measures to create the more responsive social and cultural conditions necessary for a better application of science and technology to development. They should facilitate the creation of informed public opinion on science and technology matters by the popularization of science and technology through the mass media or other means.

A.13. As a parallel to mobilizing science and technology for development, countries should introduce internal structural policies such as social reforms, redistribution of income and so on, as appropriate, so as to ensure that the application of science and technology does not aggravate social tensions.

A.14. Developing countries should make special efforts to ensure that the earning capacity of rural communities is increased through the application of science and technology.

Science and technology infrastructure and research and development network

A.15. Developing countries should, as a matter of the highest priority, establish, strengthen and develop national science and technology infrastructures, so as to provide the essential fabric necessary for strengthening scientific and technological capabilities.

A.16. Developing countries should establish and strengthen national centres for the generation, development, assessment and transfer of technologies, which would function as key agencies for the development of endogenous technologies, as well as for the selection, assessment, adaptation and assimilation of foreign technologies.

A.17. Developing countries should:

(a) Establish and strengthen a network of research and development institutions and link them more closely to the productive system so as to enable them to meet the actual demand created by the dynamics of the economy and by government action; such a network should include institutions with explicit responsibility for translating the results into commercial application; Governments should promote basic research as well as applied research and development in a balanced mix;

(b) Consider the establishment of government agencies for research and technical assistance so as to optimize the manpower, technologies, resources and capital needed for setting up a national system of science and technology; such agencies should be designed to supplement, rather than supplant, existing institutions;

(c) Closely co-ordinate research and development work between the State, industry, universities and other institutions, so as to achieve optimum utilization of the national resources and skills available in the interests of national development;

(d) Adopt specific and co-ordinated measures to stimulate research and development by endogenous enterprises; Governments should, in particular, reorient their fiscal, financial and tax mechanisms, such as financing, subsidies, tax rebates, import policies and the like, to induce and encourage industrial and other enterprises to undertake "in-house" research and development activities in conformity with national priorities;

(e) Ensure sufficient funds for national research and development activities through direct subsidies, preferential purchase of products developed and national research and development in the public sector, and should offer tax incentives, bank credit facilities and the like in the private sector.

A.18. Developing countries should:

(a) Devote particular attention to the creation and strengthening of a national capacity in consultancy, design and engineering, pre-investment and feasibility studies, as well as in management, administration and marketing, since these are a sine qua non for strengthening their technological capabilities;

(b) Compensate their engineering firms for their smaller capacity to absorb risk and to provide guarantees of performance comparable to those of international engineering firms. To this effect, the Governments of these countries should consider the creation of risk coverage and financing schemes to stimulate endogenous engineering development;

(c) Promote services for metrology, standardization and the like, as well as for plant and equipment maintenance.

A.19. Developing countries should strengthen and co-ordinate their agricultural and industrial extension services in order to achieve a more effective and more efficient transfer of information to the end-users, particularly in the rural areas, and to allow feedback to the research and development institutions concerned.

A.20. Developing countries, in order to improve and intensify the exchange of information through person-to-person contacts, should promote and support scientific and professional associations and encourage their decision makers, scientists, technologists and entrepreneurs to communicate with each other and to participate in conferences, meetings, visits, study tours and the exchange of personnel at home and abroad.

A.21. Developing countries should, at the national level, ensure compatibility and co-ordination of the activities of the different components of the science and technology system, especially enterprises and research and development institutions, in long-term perspective. The establishment of national research development corporations to act as intermediaries between research institutions, entrepreneurs and financing institutions should be explored.

A.22. Developing countries should establish adequate machinery for the evaluation of the social and cultural aspects of science and technology and of the cost-benefit ratio in technological innovation.

A.23. Developing countries should encourage the increased participation of larger domestic enterprises in projects of the broadest possible scope, especially in sectors of high priority or involving complex technologies. The modern sectors, generally based on product design and processes of foreign origin, should rely more on local inputs.

A.24. Developing countries should offer special incentives, including taxation measures, to stimulate their enterprises, particularly the small- and medium-sized ones, to undertake research and development activities consistent with their national science policy, either individually or collectively and to adopt more rational management and production methods.

A.25. Special efforts should be made by developing countries to stimulate and promote by legislative and other means the demand for goods and services based on endogenous technologies.

A.26. Governments should give priority to enterprises that either generate or use domestic technologies in awarding research and development contracts related to the specific needs of the Government or to sectors where the return on investment is uncertain or long delayed.

A.27. Developing countries should support scientific and technological research programmes in the public sector in fields that are of national social importance but do not necessarily attract support from the private sector.

Development of human resources

A.28. Developing countries should:

(a) Formulate policies for scientific and technological manpower; such policies should, inter alia, encourage universities and other educational institutions to be more responsive to the problems of society, particularly by integrating them with the productive system and the cultural pattern of the country;

(b) Adopt policies that facilitate constant adaptation by its labour force to the swift changes characteristic of the modern world; relevant vocational training, and in particular adequate training of researchers and technicians employed by production units, should be an essential element of such a policy;

(c) In their programmes for training the national labour force, make special provision to increase the productivity of low-income groups and enable people who have been prevented from exploiting their full potential, particularly women, to play their full role in society;

(d) Make a thorough evaluation at the national level of the "brain drain" problem with a view to identifying measures for stemming and reversing the emigration of skilled manpower and to this effect provide due social status to scientists and technologists.

Technological assessment and transfer

A.29. Developing countries, before concluding technology transfer transactions, should ascertain the nominal costs (payment for the right to use patents, processes, know-how, trademarks, technical services and the like) and the real costs (return on investment, price of raw materials, intermediate goods, technical assistance, management and the like) and ensure that adequate information is obtained to enable the proper technical and financial evaluation of the transactions. Developing countries should develop the capacity to unpackaged transferred technologies so as to determine the costs of the different elements.

A.30. Developing countries should:

(a) Strengthen their capabilities for the assessment of technologies from the point of view of their national development objectives having regard to social, cultural, environmental and political aspects. Such a screening process should ensure that technologies which are unnecessary or undesirable are not imported;

(b) Ensure the elimination from all transfer arrangements of any contractual or other restrictions which might hinder their economic and technological development; in the long term, these aspects may be more important than the purely financial costs of technology transfer.

A.31. Each developing country should formulate a policy for the transfer of technology as an integral part of its national policy for scientific and technological development. Such a policy should favour technologies that are easily assimilated and adapted, are amenable to improvement or local innovation, can be integrated with local inputs and complement domestic technological development.

A.32. Developing countries, particularly the least developed, should mount a major effort to graft more advanced technologies on to the traditional processing technologies based primarily on rural resources and local skills.

A.33. Each developing country should establish, under the direct control of the Government, a national centre for the development and transfer of technology. Such a centre should be closely associated with the bodies responsible for scientific and technological policy making and information, and with the over-all development machinery. These centres should have the required scientific, technological, legal, economic and social competence.

A.34. The national machinery in charge of technology development and transfer should:

(a) Formulate policy guidelines and regulations on transfer of technology;

(b) Establish an integrated system for the selection of technologies, including assessment and unpackaging;

(c) Gather and disseminate information on alternative sources of technology and terms of transfer and data on similar national and foreign transactions;

(d) Promote the reorganization of the national legal structures for the transfer of technology, including the revision, where necessary, of national legislation relating to industrial property so as to safeguard the interests of domestic innovation;

(e) Adopt instruments for regulating and guiding the import of technology, not only in regard to direct and apparent transfers of technology, but also relating to technical assistance contracts, engineering services, investment and reinvestment, as well as invisible transactions between foreign companies and their branches in developing countries;

(f) Monitor investments, imports, monetary transfers, employment of foreign personnel, mandatory research and development in branches of foreign enterprises in developing countries and their co-operation with local research and development organizations;

(g) Establish, if necessary, an endogenous capacity in the field of industrial licensing;

(h) Establish a register for the compulsory recording of contracts and other technological transactions with foreign suppliers;

(i) Negotiate the purchase of technologies for the public sector and advise private enterprises on the acquisition of technology in order to avoid inappropriate or unnecessary purchases, excessive expenditures and clauses harmful to national interests;

(j) Promote the adaptation and assimilation of technologies and encourage increased utilization of local inputs, particularly national resources and subcontracting; and

(k) Ensure the application of national standards and quality control requirements.

A.35. Developing countries should establish machinery for monitoring, evaluating and regulating the activities of transnational corporations to ensure that these activities are consistent with the national socio-economic objectives and technology policies. The objective should be to ensure that transnational corporations:

(a) Actively promote a horizontal diffusion of technology within the country;

(b) Promote research and development in their subsidiaries and ensure its linkage with national output;

(c) Give priority to the use of local raw materials, intermediate products, technology and personnel; and

(d) Organize technical training programmes in the countries concerned. In this connexion, Governments of developing countries should secure the right of access to all information and data on transactions between subsidiaries and their parent companies.

A.36. National information policies and plans should be formulated as an integral part of over-all science and technology policies and national development plans. These should include responsibilities such as planning, programme development, co-ordination and stimulation of science and technology information activities, including technical support for extension services.

A.37. Nation-wide co-operative information systems in developing countries in areas of national priorities should be developed, in order to maximize the use of

local resources and to reach all sectors of the population. These systems should be compatible with international standards and procedures to facilitate the exchange of information and participation in regional and international systems and networks.

A.38. To secure the co-operation of developed countries, developing countries should identify problems which are specific to their conditions and for which their scientific and technological capability is insufficient.

Subregional and regional level

Harmonization of science and technology policy and resource development

A.39. Developing countries should:

(a) As an essential element in fostering greater co-operation among themselves, identify their respective needs and requirements in the field of science and technology, in order to achieve a common policy for deriving the maximum benefit from their resources;

(b) Harmonize their science and technology policies with their development policies with a view to achieving greater collective technological self-reliance; they should in particular formulate a policy framework through which their own financial, natural and human resources become fully effective;

(c) So formulate their national policies as to facilitate preferential treatment to other developing countries, particularly to the least developed and more vulnerable: particular importance should be given to areas such as export-import, processing and basic industries, consultancy and design engineering and the like;

(d) Reorient their internal policies so as to encourage greater co-operation among themselves in establishing interlinked scientific and technological infrastructures.

A.40. In order to acquire the practical means to stimulate exchanges of information and experience, developing countries should establish suitable interlinked information networks and data banks, which would, inter alia, enable exchanges of information on training and education programmes; conditions for the transfer of technology; terms of foreign investment; and activities of transnational corporations.

A.41. Developing countries, particularly those facing similar problems, should prepare a joint inventory of their natural resources with a view to deriving the maximum benefit from them. Wherever possible, countries with the same raw materials should aim at establishing appropriate institutional mechanisms to safeguard their legitimate interests.

A.42. Developing countries should:

(a) Undertake joint initiatives relating to the exploration and exploitation of their mineral and energy resources, so as to reduce their dependence on advanced countries and to achieve economies of scale;

(b) Stimulate and establish joint industrial projects, based on the principle of optimizing common resources, capital and skills, including suitable arrangements for market sharing; such joint action would also reduce their technological dependence on transnational corporations;

(c) Manifest greater cohesiveness and co-ordination in their approach to the utilization of their most important natural resource - namely manpower - by supplementing each other's needs and by establishing a "developing countries' skilled manpower pool".

A.43. Developing countries should in the first instance endeavour to obtain their technical resources from other developing countries. Similarly, the placement of fellowships and the procurement of equipment should also be directed towards other developing countries, whenever their facilities and experiences are suitable, so as to maximize the use of available capacities in other developing countries.

Institutional framework for collective science and technology development

A.44. In order to ensure adequate institutional support, developing countries should adopt the following measures:

(a) Existing national centres for research and training should be enabled to perform multinational functions;

(b) Adequate communication, co-operation and linkage should be maintained and strengthened between national centres, public and private enterprises, and institutions active in the same field;

(c) Subregional, regional and interregional centres, such as centres for the development and transfer of technologies and centres for the servicing and maintenance of equipment should be used and strengthened;

(d) Sectoral centres and networks and interdisciplinary research centres should be encouraged;

(e) Interregional linkage between subregional and regional organizations dealing in the application of science and technology should be stimulated.

A.45. Developing countries should undertake the primary responsibility for establishing and strengthening a suitable mechanism for co-operation among themselves. They should establish a common science and technology fund to which the most prosperous among them should contribute more generously. Developed countries should contribute to such a fund.

Least developed, land-locked and island developing countries

A.46. Special measures should be taken, in the context of greater horizontal linkages between developing countries, to protect the interests of the smaller and more vulnerable developing countries, particularly the least developed, land-locked, island developing and most seriously affected countries. Such measures should endeavour to ensure the full and active participation of these countries, including full access under favourable terms to technologies already existing or under development in other developing countries. The special problems of these countries should be given high priority in mobilizing science and technology to eliminate obstacles to their development, particularly in research and development, manpower utilization and so on. They should also receive preferential treatment for financing the application of science and technology. Special consideration should be given to island developing countries which are handicapped by small markets and limited economies of scale.

Exchange of information and experience

A.47. Developing countries should share among themselves information and experience on industrialization, particularly from those among them who have already acquired the know-how. They should establish co-operative arrangements and more intensive and innovative programmes for transmitting relevant technology and technical and managerial skills, particularly to the least industrialized countries.

A.48. Developing countries should also share among themselves information and experience in the most relevant fields, such as agriculture, health and communications, and with respect also to simpler technologies.

A.49. Developing countries should exchange information and experience relating to education and training systems.

A.50. Developing countries should promote their scientific and technical publications, which could be used in exchange for similar publications from other countries.

A.51. Developing countries should promote their own scientific and professional associations and encourage their decision makers, scientists and technologists to participate in regional and international conferences and seminars and to undertake technical visits and study tours.

Developed countries

A.52. Developed countries should take measures to help the developing countries in their efforts to formulate and implement their national policy in science and technology.

Research and development

A.53. Developed countries should:

(a) Regard efforts for reinforcing the science and technology potential of developing countries and devoting a certain portion of their research and development activities to the specific problems of primary interest for developing countries as an integral part of their national science and technology policy;

(b) Encourage major programmes in the field of research and development and technological innovation in order to facilitate a new international distribution of labour; they should also develop adjustment mechanisms in order to ensure redeployment and to avoid undue hardship for the workers, employers, communities and corporate owners more directly affected by the above-mentioned shifts;

(c) Establish links between their research and development institutions and their counterparts in developing countries to ensure a continuous flow of technologies that would substantially strengthen the technological capabilities of the latter; joint projects should be undertaken and possibilities for the twinning of institutions explored;

(d) To the maximum extent possible, locate research and development projects on problems of developing countries in those countries and ensure that a significant proportion of the corresponding funds is spent in them.

Access to technologies and markets

A.54. Developed countries should effectively facilitate access to their markets and give preferential non-reciprocal treatment to exports of developing countries involving a technological component, such as food and agriculture products in raw and processed form, processed and semiprocessed products, part manufactured and wholly manufactured goods. Developed countries should also take measures to allow developing countries to improve their share in marketing, transportation and distribution of goods with a technological component.

A.55. Developed countries should facilitate full access by developing countries to the results of their research and development and establish suitable mechanisms for linking their innovative systems with the productive systems of developing countries.

A.56. Developed countries should promote the elimination of "technical barriers"¹⁷ to the importation of goods with a technological component exported by developing countries (standards, quality control and the like).

A.57. Developed countries should expand their efforts to help developing countries in training their scientists and technologists both through the provision of fellowships for study abroad and through visits of their scientists and technologists to developing countries. Developing countries should, however, take care to see that such exposure and training is in conformity with their priorities, needs and specific conditions. International organizations can also help in this

process by offering training facilities to the nationals of developing countries, which would to some extent eliminate possible problems arising from training in developed countries.

A.58. Developed countries should, as part of their general development aid, substantially increase their contribution to the direct support of science and technology in developing countries and ensure a reliable, assured, continuous and growing flow of assistance.

A.59. Developed countries should increase substantially the proportion of their research and development devoted to specific problems of primary interest to developing countries in accordance with feasible targets to be agreed upon.

A.60. Developed countries should co-ordinate their activities more effectively in order to maximize their scientific and technological potential for the benefit of developing countries and should also co-ordinate their research work to enable the adaptation of existing technologies and the development of new technologies which are consistent with developing countries' needs, conditions and priorities.

A.61. Developed countries should encourage their private foundations, institutions, organizations and enterprises to extend and diversify their research activities and provide effective and suitable technologies consistent with the priorities of developing countries.

A.62. The research and development efforts of developed countries devoted to the problems of developing countries should be consistent with the priorities of developing countries and should provide for the active participation and co-operative control of developing countries in their design, planning, execution and evaluation.

Interregional and international level

A.63. International organizations and especially the United Nations system should, at the regional and global levels:

(a) Provide upon request advisory services for the formulation of science and technology policy and the building of the corresponding institutional machinery;

(b) Develop appropriate analytical methods and techniques for determining priorities, planning, forecasting, data management and processing, assessment, surveillance of new developments and the like;

(c) Train specialists in science and technology policy and its integration into planning;

(d) Facilitate liaison with other institutions engaged in science and technology planning;

(e) Provide a systematic exchange of information on experiences of different countries in the field of technological planning and its integration in over-all social and economic development;

(f) Provide for meaningful consultations and exchanges of experience at international forums on science and technology policies and planning.

Research and development

A.64. Direct linkages should be established between the research and development systems of developed and developing countries through bilateral co-operative arrangements. Such arrangements should provide for (a) the mounting of joint research and development programmes, a major part of which should be carried out in developing countries and (b) the twinning of research and development institutions, in order to design and perform joint research activities, exchange personnel and share results.

A.65. Multilateral co-operation in research and development should be carried out either by national institutions, preferably of developing countries, specially designated to serve subregional, regional, international or sectoral needs, or by international centres.

A.66. Appropriate measures should be taken to improve the capability and the capacity of existing centres and networks in science and technology, avoiding an undue proliferation of institutions. Such measures should:

(a) Make the activities of sectoral and regional research and development institutions of developed countries more responsive to the needs and problems of developing countries; and, equally important,

(b) Strengthen the problem-solving capacity of developing countries in supplementing their national and regional science and technology institutions with adequate technical, financial and human resources.

A.67. Developed and developing countries, with the participation of international organizations, should develop their technological forecasting capacity in order to ensure an orderly development of their economies and take the necessary adjustment and redeployment measures.

A.68. International organizations, and especially those of the United Nations system, should co-operate fully, in particular on a regional or subregional basis, in the establishment, strengthening and development of the science and technology infrastructures of developing countries.

A.69. The international community and international organizations should, as a matter of urgency, give active consideration to the formulation of policies for mitigating the adverse consequences associated with the brain drain. Consideration should also be given, in this context, to the establishment of an international fund under United Nations auspices, which would be used, inter alia, for strengthening training facilities and the science and technology infrastructure of the developing countries.

A.70. Having regard to the need for adequate allocation and co-ordination of resources for scientific and technological development, suitable techniques, methodologies and instruments should be established for the evaluation of expenditure, budget programming and the introduction of practices of project approval for financial institutions, in order to give full consideration to their science and technology content. Such systems - preferably compatible - should be established in both developing and developed countries, as well as in international institutions.

A.71. External financing for scientific and technological development in developing countries should be provided without ties.

A.72. International financing agencies and similar agencies of developed countries should evaluate and assess science and technology projects from the viewpoint of the recipient country and take into account the long-term nature of science and technology activities by providing long-term financing. They should envisage financing the entire cost of national science and technology programmes and not merely the foreign exchange costs of imports and ensure that there is adequate provision of funds for infrastructure and for research and development in the priority sectors of the country.

A.73. The United Nations system should strengthen the scientific and technological capability of developing countries by providing expertise and resources and by monitoring co-operative projects in the field of science and technology.

TARGET AREA B

RESTRUCTURING THE EXISTING PATTERN OF INTERNATIONAL
SCIENTIFIC AND TECHNOLOGICAL RELATIONSIntroduction

The pattern of international relations in science and technology, it is now widely recognized, is imperfect and reflects gross disparities among nations. It mirrors a situation in which a few countries - and indeed corporations headquartered in those countries - assume technological dominance and determine the direction and development of technologies in critical sectors, placing a great majority of countries, notwithstanding their vast resources, human and material, in a state of technological dependence. Indeed, the concentration of technologies in developed countries is estimated to be even more pronounced than the concentration of capital. The growth of transnational corporations has in many cases been faster than the rise in the gross national product of many developing countries. Transnational corporations are estimated to control as much as about 50 per cent of technology transfer, which is mostly intra-firm.

The international community has reached a broad consensus on the essential principles governing the sharing of such knowledge and experience among its members. It is agreed that every State has the right to benefit from advances in science and technology in accelerating its economic and social development. Accordingly, all States should facilitate access to the achievements of modern science and technology, especially by developing countries. The free exchange of knowledge and experience must therefore be an essential element of any strategy for integrated international development, since it helps the weaker and the more vulnerable countries and also optimizes finite global resources. In practice, however, the sharing of knowledge and experience among members of the international community continues to be impeded by serious obstacles.

For developing countries to attempt, as an alternative, to generate the scientific and technological knowledge required for their development without making full use of the knowledge already made available by scientists and technologists all over the world, particularly to developed countries, would not only be a task of extreme difficulty but would also be wasteful and unreasonable. It would not only extend beyond acceptable limits the time-frame in which these countries could hope to achieve their development goals but also, if adopted universally, it would retard technological progress in all countries, including the most advanced. In the modern world, no country can be an island unto itself.

Dependence on technology has two different but interrelated facets. First, there is the more visible external dependence arising out of excessive financial costs, monopolistic contracts, incomplete transfers, shadow-pricing, restrictive clauses or practices and the like. Secondly, there is the more subtle type of dependence inherent in transfer of technology, such as the imposition of inappropriate alien standards and attitudes on traditional cultures and value

systems, leading to social "dualism" in the recipient countries, the disintegration of rural societies and the middle class, the establishment of enclaves of developed foreign economies and the inhibition of endogenous scientific and technological growth and capabilities.

It is therefore necessary, in formulating any policy for the transfer of technology, to take into account these two types of dependence and to arrive at a satisfactory balance, since the measures required to reduce them are to some extent contradictory. Whereas in the first case it is primarily a question of removing obstacles to the flow of technology and ensuring that it takes place on the economic terms most favourable to the recipient country, in the latter case it involves the selection of desirable technologies and the building of barriers against undesirable ones. In any event, the present imbalance between developed and developing countries calls for a screening mechanism to control indiscriminate flows of technologies resulting from the "free mechanism of the market". It should constantly be borne in mind that the transfer of technology must also be dovetailed into the national framework for strengthening endogenous scientific and technological capabilities.

The international structural imbalance is manifested not only in the concentration of technical knowledge and capital goods in developed countries but also in the absence of integrated capital markets in developing countries, as a result of which these countries are obliged to seek the financial resources required for their development principally from external sources. Consequently, any strategy for a more balanced international pattern of technology transfer becomes unfeasible without a fundamental structural alteration in the decision-making processes, technological as well as financial, at the international level, including the developed countries. And such an effort has to be made within the over-all framework of the establishment of the New International Economic Order.

A related aspect of international science and technology is that about \$20 to \$25 billion every year are being spent on military research and development, involving close to half a million scientists and technologists. This constitutes a colossal waste of human and material resources. It is imperative to mobilize world opinion and identify measures to redeploy these resources more productively.

The restructuring of the international scientific and technological relations should include free access to the achievements of modern science and technology, especially by developing countries. In particular, developing countries should be enabled to draw upon the reservoir of technologies generated in developed countries, more particularly the advanced and sophisticated technologies that are essential for speeding up the development of developing countries. Developing countries should also exchange experiences and knowledge among themselves in a more systematic and institutionalized manner. To achieve more equitable and harmonious international scientific and technological relations, basic structural transformations are required.

Recommendations

Subregional and regional level

B.1. Developing countries should systematically exchange information among themselves about:

(a) Technology transfer transactions, including the terms and conditions of transfer;

(b) Foreign investments;

(c) Activities of transnational corporations;

(d) Legislation and practices regarding the transfer of technology;

(e) Criteria for the selection of technologies;

(f) Contracts, including completed as well as rejected proposals listed in the national registers; and

(g) Experience in applying transferred technologies.

Such information should be broken down to the level of individual transactions.

B.2. Developing countries should:

(a) Co-ordinate their policies for the selection, acquisition, adaptation, assessment and development of technologies, as well as their domestic legislation on industrial property, foreign investments and transnational corporations;

(b) Co-operate in improving the conditions and terms for the acquisition of technology, machinery and equipment by joint purchase whenever feasible;

(c) Adopt joint policies in the current international negotiations related to the transfer of technology.

Developed countries

Access to information

B.3. Developed countries should:

(a) In view of the accumulation and concentration of scientific and technological know-how in their countries, make every effort to make their information resources readily accessible to users from developing countries;

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(b) In regard to commercially available information, adopt measures and arrangements allowing developing countries to use their specialized information systems and acquire their publications at reasonable cost and, whenever possible, in local currency or free of charge;

(c) Provide full access to information on available technologies, terms and conditions of supply, local technical and management requirements, activities of transnational corporations and other information useful in counteracting the opacity often surrounding their transactions.

B.4. Developed countries should provide copyrights on favourable terms to developing countries for works related to science and technology.

B.5. Developed countries should facilitate the access of developing countries to those technologies that are essential to their development, including advanced technologies.

Transfer of technology and transnational corporations

B.6. Governments of developed countries should co-operate closely with Governments of developing countries in monitoring, evaluating and regulating the activities of transnational corporations and should establish machinery for this purpose. They should provide appropriate incentives and disincentives to transnational corporations to ensure that their subsidiaries conform to the national development objectives, technological policies and regulations of developing countries.

B.7. Developed countries should:

(a) Agree to use their influence with the suppliers of technology so that technology is transferred to developing countries on fair and reasonable terms and conditions; these should be non-discriminatory and no less favourable than the terms given to any other party;

(b) Provide incentives (tax, financing and the like) to enterprises that make evident efforts to transfer technologies to developing countries on fair and equitable terms, without restrictive clauses, and that encourage adaptation and assimilation involving a maximum of local contributions and, in sum, enhance the autonomous scientific and technological capability of the recipient country;

(c) In particular, encourage and stimulate the transfer of technology by their small and medium-sized enterprises and the participation of such enterprises in joint venture schemes with corresponding enterprises in developing countries.

B.8. Governments of developed countries should consider the formula of subsidizing the payments of developing countries on patents as a form of aid.

B.9. Governments of developed countries should:

(a) Transfer technologies without charge or for a nominal payment when such transfer is not subject to private decisions;

(b) Facilitate full and free access to technologies generated as a result of international collaborative efforts.

B.10. Developed countries should grant credits to developing countries, on terms more favourable than the usual commercial terms, for financing the acquisition of capital and intermediate goods in the context of technology transfer transactions.

Interregional and international level

B.11. Developing countries should, as an important step towards reinforcing their collective self-reliance and the implementation of the New International Economic Order, design and establish a mechanism at the interregional level with a view to increasing co-operation between Latin America, Africa and Asia aimed at strengthening their scientific and technological capacities and their bargaining power vis-à-vis third countries or groups of countries.

International information systems for science and technology

B.12. Co-operative activities aimed at the development of mutually beneficial and user-oriented information systems in areas of major scientific and technological concern, which are of particular importance to developing countries, should be promoted at both regional and international levels. Such systems, built and managed by international organizations and, in particular, the United Nations, should be so conceived as to ensure the sharing of knowledge among all nations. Member States should co-operate fully to this end with each participating country contributing relevant information to a common system.

B.13. Developing and developed countries should participate in, and make more effective use of, the existing co-operative systems in the field of scientific and technological information.

B.14. New international information systems should be developed with the needs of developing countries particularly in mind. Priority should be given to covering technical socio-economic, legal and other aspects needed for decision-making in the selection and transfer of technology. These systems should be developed in a co-ordinated manner following internationally agreed guidelines to ensure their compatibility and interconnexion with other international systems.

B.15. The United Nations system should pursue its efforts to establish a network for the exchange of scientific and technological information and in industrial technological data bank. The latter should collect and disseminate data from developed and developing countries on available technologies, conditions of licensing, identification of suitable experts, engineering and consultancy services and the like.

B.16. Bilateral scientific and technological co-operation agreements between Governments, which should provide for the exchange of science attachés as well as an exchange of research personnel between institutions with the same objectives or activities, should be concluded more frequently.

B.17. The international community should promote personal contacts between the scientists and technologists of developed and developing countries through such means as conferences, meetings, visits and study tours.

B.18. The United Nations system should assist in the identification of specific problems of primary interest to developing countries and in their study by developed countries within the framework of quantified targets to be agreed upon.

B.19. The international community should fully implement the principle that each recipient State has the right to regulate and exercise authority and jurisdiction over the process of technology transfer. The principle of sovereignty, equality and political and economic independence of nations should be observed in the transfer of technology.

B.20. Special attention should be given to the need to establish an international regulatory mechanism to supervise or monitor technological transfer or direct investment in developing countries.

Transfer of technology and transnational corporations

B.21. All States should:

(a) Co-operate with a view to evolving internationally accepted guidelines or regulations for the transfer of technology, taking fully into account the interests of developing countries. Such guidelines and regulations should cover all categories of transactions, patented as well as non-patented technologies, including the operation of transnational corporations and other suppliers of technology;

(b) Using their right to regulate and supervise the activities of transnational corporations within their national jurisdiction, take measures to ensure that such corporations eliminate restrictive and corrupt practices, conform to the national plans and objectives of developing countries, encourage decentralized research and development activities, adapt and diffuse technologies, and use the local resources and manpower of developing countries to the maximum extent;

(c) Agree on international conventions on patents and trademarks to be reviewed and revised so as to meet, in particular, the socio-economic needs of developing countries. These conventions should be transformed into instruments of co-operation with developing countries in the transfer and development of technologies, and in particular provide preferential and non-reciprocal treatment to developing countries, deleting all clauses harmful to the development of their innovative capacities;

(d) Expedite the conclusion of negotiations relating to an effective international code of conduct on transfer of technology, a code of conduct for transnational corporations and revision of the Paris Convention for the protection of industrial property, having regard to their importance as instruments for the establishment of the New International Economic Order.

B.22. All States, and in particular the developed countries, should pay particular attention to the possibilities and need for the redeployment of financial and manpower resources from military purposes to science and technology programmes for development. The United Nations should play an active role in mobilizing world opinion in favour of this important global imperative.

B.23. International organizations, and in particular the United Nations system, should play a more active role in informing, advising and assisting developing countries on all aspects related to the transfer of technology, so as to enable them to obtain more favourable terms and conditions. They should, inter alia:

(a) Establish mechanisms to provide developing countries with adequate information on alternative sources of technology, on the technical and scientific information contained in patents and on technology transfer agreements and their terms, as well as data on transactions both between developed countries and between developed and developing countries, including the operations of transnational corporations;

(b) Provide experienced personnel to assist the developing countries in the formulation, negotiation and implementation of projects for the transfer of technology, and establish training and exchange programmes for nationals of those countries, in order to develop endogenous capacities in dealing with the transfer of technology, including negotiating and bargaining skills;

(c) Promote and assist the development of suitable agencies in developing countries to deal with the transfer of technology;

(d) Establish, especially on a regional basis, data banks and centres for the transfer and development of technology, in order to complement or substitute national capacities to assist, select, adapt, diffuse and create technologies suitable for developing countries;

(e) Provide a focus for international consultations and negotiations.

B.24. Foreign and transnational corporations should play a constructive role in the economies of developing countries and contribute to the objective of achieving autonomous technological capability. To this effect, such enterprises should:

(a) Respect the social and cultural identity of the host country and refrain from encouraging undesirable patterns of consumption;

(b) Participate in promoting exports of manufactured goods;

(c) Participate in the process of domestic dissemination of imported technologies and stimulate research and development in their subsidiaries in developing countries;

(d) Enter into research and development contracts with host country institutions, preferably through specific provisions made in the budgets of their subsidiaries;

(e) Adapt their imported technologies to the social and economic needs of the host country in accordance with its stated requirements:

(f) Give preference to the use of local raw materials and subcontracting;

(g) Employ workers and technical personnel trained "in plant" or in local institutions;

(h) Strengthen the science and technology infrastructures of developing countries, particularly in relation to production and process innovation.

B.25. Transnational corporations should also enter into joint ventures with local enterprises so as to provide a favourable environment for direct foreign participation in national economic development. Such arrangements might also include a partnership with a public or private enterprise or with both.

TARGET AREA C

STRENGTHENING THE ROLE OF THE UNITED NATIONS IN THE FIELD OF SCIENCE
AND TECHNOLOGY AND THE PROVISION OF INCREASED FINANCIAL RESOURCESIntroduction

The evolution and orientation of the United Nations system as an effective instrument for bringing about the New International Economic Order has been one of the striking features of the international scene in recent years. However, there has also been a growing awareness of the inadequacies of the system to perform a more dynamic and decisive role in accelerating the economic development of developing countries. The need for greater cohesiveness and co-ordination of the various organizations and agencies of the United Nations system, particularly in the area of science and technology, has been increasingly emphasized by Member States and has also emerged clearly in the national papers for the Conference. In effect the position has scarcely changed since 1973, when it was set out in a United Nations document. ^{4/}

The steps so far taken, within the United Nations system, to improve the situation have largely been institutional reforms involving reviews of the mandates of individual components of the system, so as to reduce overlapping, competitiveness and duplication of efforts. It is now apparent that so-called "institutional approaches" cannot be sufficient in the sphere of science and technology and that the solutions to the present problem must be sought elsewhere.

The international community, notwithstanding some success achieved on a bilateral basis, has not yet established any forms and procedures for scientific and technological co-operation. While the United Nations has attempted to tackle important problems like the transfer of technology and industrial property, a unified and coherent conception of world science and technology development still remains a goal to strive towards.

^{4/} "The Secretary-General has mainly concerned himself ... with the role of science and technology in the United Nations system. The findings are not reassuring, in spite of the substantial achievements of the various members of the United Nations family within their constitutional competence and functional terms of reference. There is no comprehensive "science policy" in the United Nations for application of science and technology to comprehensive improvement of the human condition. The scope of the scientific activities of the specialized agencies does not encompass the range of new developments, nor do these activities always possess the necessary coherence. A result of this has been a proliferation of committees, conferences and expert bodies improvised to meet changing circumstances or new demands. On interdisciplinary issues, the United Nations system has tended to be bypassed. Member States have not given to the United Nations or to its specialized agencies the power of initiative or the means commensurate with the new challenges and opportunities within their spheres of competence. The United Nations as presently organized is inadequate to deal with the range and dimensions of tasks which are global and which involve the whole of mankind." (E/5238, para. 8).

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It will be apparent from the foregoing analysis that basically the main problem with respect to science and technology in the United Nations system is not institutional and that the first prerequisite should be to secure the commitment of all Member States - developing as well as developed - to apply science and technology to development. Similarly, any future institutional preoccupation should emphasize co-ordination between existing components rather than defining and redefining areas of competence. This co-ordination should be implemented within the framework of a general science and technology policy for the United Nations system. At the same time the formulation of specific objectives, the establishment of general long-term over-all planning, and particularly the vertical and horizontal harmonization of the medium-term plans of the different agencies, are required. An equal measure of co-ordination of agency programmes within individual countries, as already initiated in the present country programming process, is also required.

Recommendations

Policy formulation and guidelines

C.1. The United Nations system should:

(a) Formulate an over-all harmonized science and technology policy in line with the development strategies required by the establishment of the New International Economic Order; as a prerequisite, the objectives and priorities of the United Nations system must be clearly identified;

(b) Aim at the formulation of a comprehensive, long-term science and technology plan for the whole system; such a plan, at least in its initial stage, should not specify the executing agencies for the implementation of its component parts and should enable adjustments to be made at the execution stage through the existing co-ordination machinery and through other measures;

C.2. Each organization of the United Nations system should evolve a medium-term plan vertically compatible with the over-all science and technology plan; horizontal compatibility between the medium-term plans of the organizations of the United Nations system should be ensured through mechanisms of interagency consultation.

C.3. The United Nations system should evolve special policies and measures to ensure intersectoral programming and co-ordination of the scientific and technological activities of the various United Nations bodies, having due regard for the different models and priorities of individual Member States with different needs, evaluation criteria, production factors and the like, as well as for the need to integrate United Nations programmes with national, bilateral and other efforts; such a system of co-ordination should also ensure close linkage between country programming and other projects, including those financed under the regular United Nations system budgets.

C.4. The machinery for co-ordination and over-all policy-making for science and technology in the United Nations system should have four essential components: one

representing Member States; one representing the specialized agencies and other organizations of the system; one representing independent scientific and technological expertise; and one corresponding to a substantive secretariat. The substantive secretariat should also have referral functions, identifying for Member States and other interested parties the most appropriate United Nations organization to perform required scientific and technological activities.

C.5. The science and technology programmes of the United Nations system should be reviewed and reoriented so as to be fully consistent with the New International Economic Order.

C.6. United Nations policies and programmes in science and technology should reflect more adequately the priorities of Member States, particularly developing countries, and correspond to their expressed needs and plans and the political will of the countries.

C.7. The United Nations system should strengthen its evaluation mechanisms in order to assess the effective contribution to the developing countries of the activities of the system in the field of science and technology.

C.8. Developing countries should be enabled to play an effective role in the decision-making and operational processes of international organizations dealing with science and technology. Such a role should be facilitated by more substantial representation on government bodies, on the various secretariats and in the planning and execution of science and technology projects.

C.9. International organizations should each draw up a special list of experts and advisory and engineering services in the developing countries and should make preferential use of these personnel and services in their technical and financial co-operation programmes.

Financing

C.10. In the area of science and technology, the United Nations development system should increasingly finance projects and activities related to co-operation between developing countries, including regional, interregional and global co-operation.

C.11. Appropriate international financial machinery should be established to secure on a continuing basis additional funds for promoting joint programmes for the development of science and technology aimed at solving common problems of developing countries and especially to create and strengthen the autonomous technological capacities of developing countries in line with the programme of action adopted by the Conference. Such mechanisms should enlist the co-operation and contributions of developing countries, developed countries and international organizations.

C.12. International financing institutions should substantially increase their allocations to science and technology for development, setting aside a specific part of their total lending for this purpose. The share of development assistance

programmes with a significant technological content administered through the United Nations, its affiliated bodies and specialized agencies should be increased regularly by an agreed percentage.

C.13. International financing institutions should encourage the maximum utilization of design, consultancy and engineering services, as well as machinery and equipment, of developing countries, rather than those of developed countries.

C.14. An international compensatory fund should be created - to which the developed countries should contribute substantially - to compensate developing countries for the loss of their skilled manpower and to help in their technological transformation. The United Nations should take an active part in the establishment and management of such a fund.

C.15. Consideration should be given to the establishment of a risk capital fund, associated with existing international and regional finance institutions, to finance technological projects in developing countries.

Delegation and decentralization

C.16. United Nations organizations and agencies should, to the extent possible, decentralize their activities and delegate their responsibilities for the implementation of science and technology programmes to the regional and subregional level.

C.17. In order to ensure a more effective interaction with national activities, better contacts with developing countries and greater encouragement of regional self-reliance, the United Nations regional commissions should be strengthened and should act as a focal point for scientific and technological activities, co-operating at decentralized levels with other organizations.

C.18. To take account of the geographical and economic diversity of the areas of the five regional commissions, the activities of subregional organizations should be strengthened and co-ordinated.

Global problems

C.19. The United Nations system should give serious consideration to the need for identifying a certain number of action-oriented international research pilot projects or demonstration projects of an interdisciplinary and interagency nature, so as to illustrate the advantages of combining knowledge, resources and the political will of the Member States. Such programmes should be consistent with the social and economic priorities of developing countries and should be chosen from the subject areas identified by the Preparatory Committee at its second session. 5/

5/ See Official Records of the General Assembly, Thirty-third Session, Supplement No. 43 (A/33/43), annex I, resolution 3 (II).

C.20. The international community, and in particular the United Nations system, should stimulate world-wide co-operation on global problems that either transcend national frontiers by their very nature (those concerning oceans, outer space, meteorology and the like) or by the fact that they are caused by a lack of knowledge (those resulting from global pressures on food, energy resources and raw materials, for example) or by misuse of technology (such as those related to armaments).

C.21. The international community, and in particular the United Nations system, should make determined efforts to ensure that developing countries reach the Lima target of 25 per cent of the world's industrial production by the year 2000 and in particular should mobilize science and technology, including the restructuring of international science and technology fabric, to achieve this goal.

C.22. International co-operation on global problems should be so structured as to reconcile, on the one hand, the independent approach inherent in national sovereignty and, on the other, the increasing imperative for international management and interdependence between nations in science and technology. Such a framework should enable all States to participate on an equal basis in decision-making and in the resultant benefits.

C.23. International organizations should give the maximum support to the translation of collective self-reliance into specific programmes and should fully encourage and participate in the preparation and implementation of such projects. They should also stimulate collaborative association among national and international technical organizations.