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SCIENCE AND TECHNOLOGY IN LATIN AMERICA: REGIONAL DIAGNOSIS AND ACTION PROGRAMME

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1/ The complete regional document, including this section, will be sent later to the government.

/PRESENTATION

PRESENTATION

The Economic Commission for Latin America, in response to the recommendations of the Latin American Regional Preparatory Meeting for the United Nations Conference on Science and Technology for Development, held in Panama City from 16 to 21 August 1978, convened a technical group of government experts from Latin America and the Caribbean to collaborate with the Secretariat in revising and preparing a draft regional document and programme of action to be examined by the Regional Preparatory Meeting during its second session, to be held before the end of the year.

The group of experts met in Mexico City from 30 October to 2 November 1978 to study document E/CEPAL/L.183 prepared by the Executive Secretariat of CEPAL.

/II. RECOMMENDATIONS

II. RECOMMENDATIONS FOR AN ACTION PROGRAMME FOR THE APPLICATION OF SCIENCE AND TECHNOLOGY TO DEVELOPMENT

A. GENERAL CONSIDERATIONS

1. Despite the efforts made by the developing countries to surmount the internal and external barriers to their development, many difficulties still exist that prevent them from putting qualitatively different styles of development into practice. The ultimate goal is not to achieve the type of development of many of the industrialized countries, but rather to achieve a style of economic and social development that is in keeping with the genuine interests and aspirations of the developing countries themselves. Consequently, efforts should be made to seek scientific and technological options that will satisfy the aspirations of the population and attend to its priority problems, and only when it is necessary will there be recourse to reproducing technologies used in the developed countries.

2. The United Nations Conference on Science and Technology for Development is one of the mechanisms adopted by the international community for the establishment of the New International Economic Order.[1/]

3. As defined in the relevant General Assembly resolutions[2/] and in other United Nations bodies and organizations, the New International Economic Order is a model of international co-ordination whose purpose is to create appropriate conditions for the developing countries to achieve self-reliant development by means of an accelerated industrialization process, thereby reducing international inequalities, providing the bases for the emergence of individual and collective self-dependence in these countries, and eliminating the persistent dependency affecting them.

4. The model of the New International Economic Order entails the restructuring of international relations in order to bring about changes in the present division of labour and in the relations existing in the present international order so as to transform its most outstanding characteristic, its assymetrical nature, into one of negotiated symmetry by means of greater participation of the developing countries in the world industrial

1/ General Assembly Resolution 3362 (S-VII).
2/ Resolutions 3201 (S-VI), 3202 (S-VI) and 3281 (XXIX) and Resolution 87 (IV) of the United Nations Conference on Trade and Development (UNCTAD).

/activities;

activities; the achievement of their self-dependence in the production of food; the strengthening of their local scientific and technological capacity; and the increased access of these countries to the flow of financing and scientific and technological know-how available in the world.

5. The restructuring of international relations implies a number of structural changes in both the national and international spheres. The following principal internal changes should be stressed:

(a) National control over the prospecting, exploitation, production and marketing of natural resources;

(b) Co-ordination, regulation and orientation of the industrial sector, including the activities of transnational corporations;

(c) Co-ordination of the export sector with the agricultural and manufacturing sectors;

(d) Orientation of technological change towards the requirements of a locally defined model of development and adaptation of social structures;

(e) Regulation of the transfer of technology in such a manner that it does not create distortions in the internal economy; and

(f) The carrying out of agrarian reform and the use of other instruments to eradicate obsolete agrarian structures in agricultural production.

6. In the international sphere the principal structural changes should include, inter alia:

(a) Redistribution of the world's productive potential;

(b) Access of the developing countries to the sources of international financing and the generation of scientific and technological knowledge; and

(c) The development of new forms of international co-operation that will tend to strengthen internal development efforts in order to achieve internally defined processes of development.

7. In the area of science and technology the establisment of a New International Economic Order includes, inter alia, the following changes:

(a) The establishment of decision-making capacity in technological matters;

(b) The identification

(b) The identification of priority areas in which endogenous scientific and technological development creates favourable conditions for achieving the desired model of development;

(c) The elimination of elements that make it possible for margins of monopolistic and oligopolistic exploitation to emerge in the world's technological exchange, and

(d) The establishment of new mechanisms for international co-operation that will promote better distribution of efforts and world production in the fields of science and technology.

8. Financing is one of the aspects that must necessarily be envisaged in the implementation of a new international economic order in the field of science and technology. New forms of financing are required to bring about full implementation of the activities involved in technological development. The fruits of scientific and technological activities will not be easily obtained with the limited resources available in the developing countries. It is paradoxical that the same applied research is not converted into innovations within the production sector - particularly in the industrial sector - because of deficiencies in experimental development, engineering and marketing of technology. The considerations involved in a Programme of Action in Science and Technology imply not only commitments on the part of the developing countries but decided support from the industrialized countries. The present international division of labour is rooted in the concentration of capital and of scientific and technical knowledge in the industrialized countries. A small nucleus of industrialized countries carries out a large part of manufacturing activities and produces almost all the equipment, whereas the rest of the countries carry out productive activities with less technological intensity. In the aim of correcting imbalances in international relations, the industrialized countries should compensate the developing countries by contributing more effectively to their technological development. One of the necessary roads in this context is the formulation of specific financing alternatives that will gradually make it possible to reduce the current imbalances.

/9. Scientific

9. Scientific and technological development should be generated within the framework of integral development and be oriented towards satisfying the quality of life of the population by satisfying its human, social, cultural, material and spiritual needs. This implies a redefinition of consumption patterns in keeping with each country's own real needs, avoiding the creation of artificial needs and tendencies towards luxury consumption. Such development should be of internal origin, autonomous, ecologically appropriate and based both on changes in the economic, social and cultural structure and on decisions dictated by the needs of the majorities.

10. The common elements characterizing self-reliant scientific and technological development are: the necessary participation of the state organizations, autonomous decision-making capacity in technological matters, and sustained increase of the capacity to produce one's own technological solutions.

11. The formulation of a scientific and technological policy implies the projection of State action in various aspects relating to the functioning of the science and technology system. They include:

(a) The creation, co-ordination and internal evaluation of scientific and technological knowledge;

(b) The seeking and acquisition of foreign technology;

(c) The dissemination of the existing stock of technology among enterprises or branches of industry;

(d) The training of skilled human resources; and

(e) The handling of local demand for technology, especially from the public sector.

12. The legal and institutional mechanisms for promoting increasing application of science and technology to the economic and social development process should be strengthened, reinforcing the role of the State (in its regulatory functions) and the systems for generating, disseminating and transmitting scientific and technological knowledge. This should be carried out by establishing a close relationship of such systems to productive and educational systems.

/13. It would

13. It would be advisable to achieve optimum utilization of the resources of the countries and inject vigour into the development process while at the same time maintaining social and cultural identity.

14. On both the national and international levels, scientific and technological policy should be oriented towards the creation or strenghtening of the capacity of countries to generate and adapt the knowledge and technologies most appropriate to their needs and resources in accordance with national objectives and the principle of self-determination.

15. Since man is the protagonist and at the same the end of the development process, this process should be founded on development of human resources capable of generating and transmitting specialized knowledge that will assist in strengthening the scientific and technological development process and ensure the full realization of the individual as a member of society.

16. Over the past decades several developing countries have experienced a significant exodus of human, scientific and technical resources and of skilled labour that have emigrated in answer to the better salaries and working conditions and the greater professional and social recognition offered by industrial countries of a higher level that have acted as centres of attraction for skilled personnel.

17. Governments should investigate mechanisms and means for counteracting the systematic emigration of qualified human resources and give national prominence to the labour and efforts of research groups, scientists and specialists in technology by providing them with proper social recognition. In addition, the United Nations system should grant greater attention to this question.

18. External co-operation should contribute to strengthening the local capacity of developing countries, and complement, not replace national effort. As far as science and technology are concerned, this co-operation should be diversified in keeping with the needs, resources and capacities of the different societies and communities; it should be developed on a solid scientific basis and ensure a fair distribution of its benefits.

/For this

For this purpose necessary structural changes will have to be made in the economic, social, cultural, educational and technological fields so that the results of scientific and technological development will fairly benefit all sectors of the population.

19. The need should also be stressed for increasing the economic and scientific and technological solidarity of the developing countries with the objective of increasing their individual and collective store of technology. It will be extremely valuable if the countries of the region adopt joint positions to solve common problems. International scientific and technological co-operation will only constitute a contributing factor in development to the extent that it strengthens the innovating capacity of the countries benefiting from such co-operation and thereby redistributes world scientific and technological efforts and production.

20. Achievement of a true process of transfer of technology depends on strengthening the innovating capacity of the countries benefiting from international scientific and technological co-operation, and thereby differentiates this process, owing to its content and impact, from mere international dissemination and introduction of productive techniques and processes. Scientific and technological redistribution entails renouncing the profit-making criteria of the suppliers that govern many international aid programmes. Such criteria should be replaced by criteria of international co-operation that will lead to achieving international social justice.

21. Attempts should be made to strengthen technological co-operation as a means of generating national and regional capacities for importing, adapting, creating and disseminating technologies and taking decisions on these activities. This process should give priority attention to the needs of the relatively less-developed countries, in the understanding that this does not signify the establishment of new centres of hegemony to replace traditional centres but rather implies providing harmony and dynamic impetus to the interests of the developing countries.

/22. All activities

22. All activities related to the development of science and technology should be accompanied by intensive dissemination efforts in order to create social and cultural awareness in all sectors of the population, particularly among the youth, of the importance of creation and innovation for development and to promote the training of skilled human resources for scientific and technological research. This implies appropriate use of the mass communications media and publicity.

23. Scientific and technological co-operation among developing countries is an urgent necessity, especially for countries, e.g. very small ones, which are unable to satisfy certain basic needs without assistance from other States. This aid is not only indispensable for these countries, but generally would make it possible to find just and appropriate solutions for their own development processes and for strengthening of individual and collective bargaining power with respect to third-party countries.

24. All the efforts to absorb external co-operation undertaken by national authorities in this context should be oriented towards establishing or strengthening endogenous capacity for scientific and technological development, so that the monopolistic and oligopolistic exploitation suffered by the countries that purchase technology in the international markets will decrease steadily.

25. The developing countries should participate actively in the discussions taking place in different international forums to set up codes of conduct to regulate the activities of transnational corporations and the transfer of technology. The need to amend the harmful provisions of the Paris Convention and to eliminate other barriers that slow down the transfer of technology towards developing countries should be stressed here.

26. One of the greatest obstacles to the equitable distribution of international science and technology endeavours is the colossal quantity of resources that certain industrialized countries divert to military expenditures and armaments. The funds that are squandered in this manner are so huge that it is necessary for these countries to take measures to reduce such expenditures and thereby liberate sums sufficient to eradicate

/world

world problems of malnutrition and the scarcity of health services and to promote integral scientific and technological development of the developing countries. In addition, the industrialized countries should orient their scientific and technological policies so that the results of research are not used to develop and perfect basic methods for mass extermination or systematic damage to mankind or used to create pressures that some States can use against others.

27. Special attention should also be focused on the fact that some developing countries also earmark significant portions of their budgets to military expenditures to the detriment of health and education allocations.

B. SPECIFIC SUGGESTIONS FOR A REGIONAL ACTION PROGRAMME

28. Recommendations follow for the preparation of a regional programme for the applications of science and technology to development, grouping activities nationally, regionally or internationally, as appropriate, and according to whether they refer to the incorporation of foreign technology, the generation and dissemination of know-how at the local level or the handling of demand for technology.

1. Recommendations at the national level

(a) Planning and financing of scientific and technological development

29. The formulation of medium- and long-term science and technology strategies and plans, ensuring the primordial function of the State, while based on national effort, and complemented by specific measures and legal and institutional machinery which will permit their implementation and their permanent evaluation and readjustment.

30. Orientation of the objectives science and technology strategies and plans towards clear-cut consolidation of integral development; due consideration for the characteristics of each country and its natural resources; and the integration of such strategies and plans into general economic and social development plans with due regard for the implications they hold for science and technology. These measures, inter-alia, should be taken to achieve equitable distribution of the benefits of development among all sectors of the population.

/31. The explicit

31. The explicit incorporation of the science and technology variable in national development plans or strategies as a basic instrument for achieveing the different objectives and goals contained in them; these plans should also include specific requirements at the global and sectoral level for the generation, transfer, local dissemination, incorporation and utilization of scientific and technological know-how.

32. Strengthening of the links among research and development institutions, the political system, the education system and the production sector; raising the living standards of the population; increasing the productivity of low-income groups and taking the necessary measures for integrating them into economic activities. In addition, local capacity to generate, manage, and market endogenous technology and to improve conditions for acquiring foreign technologies for their optimum assimilation and adaptation should be strengthened.

33. In the legitimate exercise of their sovereign rights over their own natural resources, an endeavour by the countries to extend the application of science and technology in the exploration, conservation and use of these resources.

34. The explicit incorporation in science and technology plans of objectives, instruments and specific actions in different fields, such as: (i) the development of basic research as one of the links in an integral concept of development; (ii) the generation of science and technological know-how in the local context; (iii) the incorporation of foreign technology; iv) the dissemination within and among sectors of scientific and technological know-how; (v) the training of human resources; and (vi) handling of the demand for technology.

35. Reference of these objectives, instruments and activities to enterprises and other agents of the private sector as well as to public enterprises, research and teaching institutes in the university area, ministries and other State offices, and their structuring in a consistent and concerted form.

/b) <u>Training</u>

(b) Training of human resources

36. Priority support to the training of the human resources required to generate and implement science and technology plans, programmes and projects, by intensifying professional training programmes and the training of national labour, and carrying out a training effort in administration and handling of technology.

37. Impetus in setting up institutions for the training of human resources in the scientific and technological fields. In addition, centres and programmes for professional and technical updating should be systematically organized on all levels to train specialized personnel to provide satisfactory coverage of all the links in the chain that associates scientific and technological research with the problems of production.

38. Preferably within the framework of an overall national policy on human resources, establishment on the part of the countries of the region of policies to provide incentive to scientific researchers, respect their freedom to work as they choose and recognize their creative efforts.

39. The adoption of measures to provide due incentive and support to the work of scientists and specialists in technology. Such measures should be aimed at providing them with broad national recognition of the work they are doing as essential elements in national development.

(c) Creation of scientific and technological know-how

40. The establishment of criteria to evaluate the effect of the tax instruments applied by certain countries to motivate scientific and technological research and consideration of the suitability of applying such instruments to countries in which they have not yet been adopted.

41. Reinforcement by Governments of the machinery for identifying, studying, preparing and evaluating scientific and technological research programmes and projects, and insurance by Governments of their close-knit correlation with national development priorities.

42. In the generation of local technological know-how achieved through subsidies to the private sector, the formulation by State policy of both suggestions regarding national priority areas of research to be undertaken by that sector and of an explicit pattern of areas of research that must be explored directly by the public sector and by institutes financed by funds from the government budget.

/43. Promotion

43. Promotion of the establishment in the developing countries of technological innovation circuits constituted by the exchanges of information and negotiation circles among the economic agents and institutions directly concerned in the development of a specific technological area. In accordance with the nature of the problems entailed by the circuit and its local and external relations, this involves the joint efforts of researchers, planners, businessmen, public officials, labour unions and campesino organizations; associations or organizations of intermediate or final users of the technologies to be developed, of the elements composing them or of the products resulting from their application; economic agents involved in the production, circulation and financing of these activities; research and development institutes; State technical organizations and so forth.

(d) Management of the demand for technology

44. The adoption of measures to create, stimulate and promote the demand for endogenous scientific and technological activities, and for goods and services containing national technology. In this respect special attention should be given to the adoption of such measures as those aimed at avoiding the imposition of technology packets on public sector contracts and purchases, the establishment of appropriate legal and administrative machinery, and the preferential use of local advisory services in engineering. Policies and legal and institutional machinery should also be promoted that will serve as an incentive to purchase national products as a means of channeling local technological creation and promoting the use of technologies and raw materials available in the country. The effects of patterns of consumption on the demand for national technology goods and services should also be borne in mind.

45. Special priority on the part of the public sector - either through financial support or direct promotion - to carrying out scientific and technological research programmes in all fields in which it is a priori feasible to expect large-scale divergencies between social and private profits, and in which external economies of some size

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may be expected which would be tapped by the social system as a whole. In nearly all the countries of the region there are deep-rooted problems of unemployment, education, public health, nutrition, pollution, housing, transport, lack of options in the utilization of free time, health of the animal and vegetable population, high degree of industrial risk, etc., where the task of creating new know-how and formulating new working hypotheses is required with most urgency. The social viability of research expenditure in many of these fields must necessarily exceed private viability, since this is sufficient justification to encourage activities of this type by the public sector.

46. Strengthening of a service of industrial technical extension, and promote the use of the equipment and technical ambience of science and technology institutions by industries, and where possible research and development workers should grasp the opportunity of working on pertinent problems in industrial settings, so that both may lean from each other and generate reciprocal confidence.

47. Support for national engineering firms in order to compensate for their smaller capacity for absorbing risks and providing guarantees of performance comparable with those that the international engineering firms are in a position to offer, which frequently have the direct or indirect support of their governments or of international organizations. For these purposes consideration should be given to direct subsidy activities that will take into account the nature of national engineering as an incipient industry. The creation of coverage and risk financing systems should be studied in particular. The greater degree of competitiveness of national engineering firms because of their ability to carry out projects on the scale required by the developing countries should also be taken into account.

48. The use of financing by State-associated organizations and other financial promotion machinery to reorient towards local sources the demand for technological services, and engineering and advisory activities, as well as the demand for certain products containing local technology.

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49. The promotion and vigorous support of the establishment of machinery for joint financing of technological development by the public and private production sectors, whose specific function would be to provide the risk capital required for generating local technological innovations. Such machinery should be constituted by contributions from the public and private sectors.

(e) The search for and acquisition of technology

50. Consideration in the pertinent policy of the intervention of the State apparatus for regulating these activities. Certain types of basic activities are called for in this area, such as: (i) the creation of apparatus for administration and negotiation to regulate the fields of external technology in which both the private sector and enterprises in the public sector are engaged; (ii) direct intervention by the public sector as a research agent in the universal technological scenario; (iii) its action as a purchaser of technology in international markets; and (iv) the disintegration of technology as a means of determining what may be produced locally. These means of action are justified both from the point of view of the earmarking of resources (centralized research would avoid the duplication of efforts and expenditure here), and in terms of strengthening the bargaining power of the countries acquiring the technology. The possible use of mechanism already part of the government apparatus for the handling of imports (tariffs, import permits, etc.) should also be studied, with a view to regulating the acquisition of technology incorporated in goods, particularly intermediate and capital goods.

51. The creation or strengthening of the technological innovation circuits that form the very basis of local generation of technology. Such circuits should be created or strengthened both in the area of public sector enterprises and in the area of private enterprises. Support to creative microeconomic groups should be provided by different means, such as the granting of invention patents and registration certificates, prizes and other similar incentives.

/52. In cases

52. In cases in which it is decided to grant invention patents, both national legislation should be studied as well as consideration of whether it is advisable to become affiliated with the Paris Convention for the Protection of Industrial Property, and if so, in what specific manner. Special care should be taken so that the Convention: (i) does not create conditions that will harm the development of national capital enterprises; and (ii) does not give rise to contradictions vis-a-vis the terms of the respective national legislations concerning the lapsing of patents that have not been used, or the validation of those registered only to protect imports by blocking the possible development of local enterprises.

53. Study of the possibility of granting special incentives in the form of patents, invention certificates and the like to university laboratories, research groups, technical schools and other public sector organizations as a means of promoting greater creation and dissemination of technological know-how by the State technological system.

54. In using incentives to promote the creation and dissemination of technological know-how, the establishment or strengthening of legal and institutional machinery to ensure that transnational corporations adapt themselves to national interests. In addition, national legislation on industrial property should be brought up to date and periodically revised in order to adjust it to the changing conditions of development.

(f) Dissemination of scientific and technological know-how

55. The establishment or strengthening of scientific and technological information systems so as to ensure access to information networks at the local level and an effective link with national users. For this purpose the information available on scientific and technological progress in the developed countries should be taken into account. Among the elements these systems should include are: the identification, characterization and systematizing of technologies generated in the country, in accordance with specific sectoral priorities; the preparation and dissemination of directories of research centres, institutes, and management and engineering consulting firms; the systematizing and dissemination of statistical information on contracts for the transfer of technology and on those offering or acquiring such technology; and the systematizing of information on foreign investment as a channel for the transfer of technology.

/56. The

56. The design of machinery to translate know-how expressed in specialized language into forms comprehensible to entrepreneurs and personnel who have no special training.

2. Recommendations at the regional level

(a) Planning and financing of scientific and technological development

57. Systematic and permanent orientation of scientific and technological cooperation towards the elimination of the elements contributing towards monopolistic or oligopolistic margins of exploitation in regional technological trade.

58. Promotion of appropriate measures and machinery to develop regional scientific and technological cooperation. It would be desirable here:

(i) To identify and make appropriate use of the proper machinery for bilateral, multilateral, subregional and regional relations;

(ii) To give impetus to the machinery for subregional and regional action that the countries may consider of importance for national, subregional and regional scientific and technological development; and

(iii) To promote the marketing or exchange of technology among the countries of the region.

59. The preferable orientation of regional cooperation towards activities related to:

(i) Scientific and technological research for the prospecting, exploitation and conservation of natural resources and sources of energy, including marine resources and the prevention of disasters;

(ii) Scientific and technological research related to the problems of education, health, housing, environmental pollution, nutrition and so forth;

(iii) The establishment of cooperative programmes for technological creation in areas such as: the manufacture of pharmaceutical products, medical and hospital technology and equipment, and technology for the control of environmental pollution; and

(iv) Scientific and technological research to attain satisfactory levels of production and in the supply of agricultural and other basic products.

/60. The

60. The inclusion in regional co-operation aimed at increasing the scientific and technological capacity of all the countries of the region of:

(i) Co-ordinated training of human resources and training, specialization, updating and ongoing education activities;

(ii) Strengthening of regional and subregional research institutions and appropriate use of sectoral investment programmes deriving from various integration plans;

(iii) Creation and strengthening of national research institutions and scientific and technological supporting services, including a technological data network, an information service on scientific and technological advances in the developed countries, interconnection with the world information networks and information on the projections of world scientific and technological development and their application to integral development; and

(iv) Development of regional scientific and technological information systems and services.

61. Cooperation in the region should take place with the recognition that the island-developing countries are handicapped by limited market size and small economies of scale.

62. Joint programming of scientific and technological activities around specific projects as one of the most outstanding aspects of regional cooperation. It would consequently be necessary to stimulate cooperation among the countries regarding topics and priorities chosen by them on the basis of specific programmes and projects designed and programmed jointly by means of technical meetings financed with international funds. These projects should distinctly include complementarity between the capacities existing in the participating countries and the needs for external participation, particularly with regard to the contribution such participation makes to the development of the technological capacity of the countries.

(b) Training of human resources

63. Urgent of the necessary policy measures to determine the causes, scope and repercussions of the drain of qualified personnel from the

/developing

developing countries to the developed countries, and the means and measures required to reverse the direction of this drain. The developed countries, and where relevant, the international organizations, should provide co-operation here.

64. In conjunction with financial, international and regional organizations, the implementation of common actions to create appropriate conditions for financing scientific and technological development co-operation projects to satisfy the specific needs of the developing countries. Special emphasis should be placed on modifying the criteria for the selection of technologies so that projects with high "technological risk" may be carried out.

(c) Management of the demand for technology

65. Adopt appropriate measures for the developing countries to have more complete and freer access to information which will enable them to obtain an adequate selection of technologies.

66. Adopt an open attitude towards the vindications of the developing countries within the negotiations taking place to revise the Paris Convention for the Protection of Industrial Property and to establish a Code of Conduct on the transfer of technology.

67. Encouragement of the effective joint and individual participation of the advisory, engineering, design and construction services of the countries of the region to deal with the demand generated in the region.

3. Recommendations at the international level

(a) Planning and financing of scientific and technological development to the developing countries

68. Promotion in the legitimate exercise of the sovereign rights over their own natural resources of scientific and technological co-operation in research, and its practical application in the exploration, exploitation, conservation and use of conventional and non-conventional natural resources and sources of energy.

/69. Implementation

69. Implementation of common activities vis-a-vis the international financial agencies so as to obtain appropriate conditions for financing their scientific and technological development, which will allow them to satisfy the specific needs of their development.

70. Active and co-ordinated participation in the negotiations on the Code of Conduct for Transnational Corporations. This Code should promote elimination of the obstacles that the transnational corporations place in the way of development of self-reliant capacity for business, financial and technological management in the developing countries.

71. Efforts to continue developing and ensuring the political will necessary to make possible an exchange of experiences and co-operation in the application of science and technology for development.

The developed countries

72. Promotion of scientific and technological research aimed at solving the problems of the developing countries and preferably carried out within these countries. Such research should be congruent with national, subregional or regional priorities and should be carried out with the effective participation and control of the appropriate national institutions.

73. Analysis of and, if necessary, increase in their financial contributions to the international organizations and the national science and technology promotion institutions so as to facilitate this promotion and increase its efficiency. These contributions should be exempt from political conditions, pressures or interference in the domestic affairs of the countries or international organizations receiving them.

74. Delivery of the contributions corresponding to a financing system for scientific and technological development in the developing countries.

75. Adoption of an open position towards the vindications of the developing countries as part of the negotiations taking place to revise the Paris Convention and towards the formulation of a code of conduct on the transfer of technology.

76. Recognition of the need to pay special attention to the requirements of the island developing countries resulting from their geographical status.

/The developed

The developed and developing countries

77. The adoption of measures to ensure that the system of financing for the scientific and technological development referred to in the preceding paragraph will be based, among other sources, on the funds derived from the reduction in military expenses of the developed countries.

78. Encouragement in the adoption of a code of conduct on transfer of technology which, in keeping with the aspirations of the developing countries,

(i) Will cover all categories of transactions, including the operation of the transnational corporations and other suppliers of technology;

(ii) Specifically regulate the suppression of restrictive practices that have or may have adverse effects on the economy of the recipient country, or impose restrictions or limitations on the development of that country's technological capacity, and ensure that the inclusion of these practices in technology agreements is considered contrary to the objectives of the code;

(iii) Contain the principle that any agreement on the transfer of technology should be governed by the legislation of the recipient country and by the norms and principles of the code of conduct; and

(iv) Provide for institutional machinery that will allow and facilitate the adequate achievement of their principle and objectives, including preferential treatment in favour of developing countries.

79. Guarantees that, in the context of the bilateral machinery, the creation of funds and other means of financing the scientific and techological development of the developing countries will not contribute to increasing the technological dependence of these countries on the transnational corporations.

The international organizations

80. Support of activities to achieve collective technological collaboration for development through the adoption of measures which will contribute to:

/(i) Granting

(i) Granting the maximum possible support to regional science and technology development programmes undertaken by the developing countries, for which purpose the international bodies should restructure their respective organizations, with a view to endowing them with the necessary sectoral consistency to give priority attention to development problems;

(ii) Reordering the United Nations system so as to avoid the duplication of efforts and omissions, and redefining the necessary functions for a clear delimitation and complementation of spheres of responsibility, and for an efficient application of the machinery for the co-ordination of United Nations activities, with the permanent supervision of the countries;

(iii) Taking into account, in the technical co-operation programmes, the need to strengthen and to use the capacity of the developing countries for administering and managing the resources resulting from these programmes.

81. Implementation of the following changes of a conceptual and structural nature with a view towards promoting achievement of the objectives of the United Nations Conference on Science and Technology for Development:

I. Conceptual Changes

(1) Adoption of new conceptual parameters for development

(i) Development is a global process whose ultimate purpose is mankind, and consequently it is made up of the entire range of factors constituting human aspirations;

(ii) Development is endogenous, that is, it emerges from all societies that undertake it;

(iii) Development is self-dependent, since it must first of all have recourse to the resources of each society; this, however, does not imply autarchy; and

(iv) Development should be ecologically appropriate in order to protect and develop the resources of the biosphere.

/(2) Adoption

(2) Adoption of a broadbased vision of the development process

The new vision of development should be based on recognition of the fact that there are many ways of achieving it and that each country must find its own way. This vision of development will contribute to making programmes of co-operation for development true vehicles for strengthening the creative capacities of peoples, which are the keystones of national scientific and technological development.

(3) Changes in the centre of gravity of co-operative activities

The new concept of development necessarily implies a change in the centre of gravity of co-operative activities, which should radiate from the requirements specified by each country in accordance with its current realities and its vision of the future.

II. Structural Changes

(1) Co-ordination and harmonization of the functions of the components of the system:

(i) Avoidance of the proliferation of organizations, meetings and reports;

(ii) Regrouping under a restructured Economic and Social Council of the various co-operation activities and programmes in general, and particularly those involving scientific and technological co-operation. For this purpose the activities of UNIDO, UNESCO, ILO and the like should be harmonized and co-ordinated by the new Economic and Social Council.

(2) Decentralization of functions

The regional Commissions must be strengthened with greater authority, autonomy and greater resources and be conceived of as the commissions of the system for regional development and international co-operation. As such, they should assume greater responsibility with regard to the needs of the countries of the region in which they are established.

In the intergovernmental sphere a single regional commission for development and co-operation should exist that includes only the countries of the region, assisted by functional or sectoral groups of experts or intergovernmental committees, as required.

/82. Periodic

82. Periodic revision and evaluation by the regional economic commissions of the World Programme of Action to be approved by the United Nations Conference on Science and Technology for Development, which should be in accordance with the actions of the Third United Nations Decade for Development, so as to include opportunely in this Programme any adjustments and corrections suggested by such study.

(b) Training of human resources

The developed countries

83. Contribution to eliminating the factors which give rise to the drain of qualified personnel from the developing to the developed countries, and adoption of a position of support to the former in the discussion on the topic taking place within the agencies of the United Nations.

The international organizations

84. Consolidation by the United Nations University (UNU) and the United Nations Institute for Training and Research (UNITAR) of their training and scientific and technological research programmes, and their adjustment to the needs of the developing countries. In addition, existing scientific and technological centres in the developing countries should be strengthened.

85. The providing of assistance to the developing countries, upon request, in the formulation of measures to promote the return of scientific, professional and technical personnel residing outside their countries of origin, bearing in mind the relevant resolutions adopted in diverse forums of the United Nations.

(c) Creation of scientific and technological know-how

The developing countries

86. Implementation of the following activities, inter-alia, to strengthen their technological capacity:

(i) Establishment, operation and strengthening of the appropriate institutional machinery among the developing countries for scientific and technological development, including interregional, scientific and

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technological information networks containing systems for the collection and exchange of information on conditions for the transfer of technology and foreign investment;

(ii) Granting of preferential treatment in scientific and technological matters to the relatively less developed countries;

(iii) Strengthening of their capacity for bargaining with the developed countries; and

(iv) Establishment of a system by means of which the relatively less developed countries can have access to technologies available in other developing countries under just and favourable conditions.

87. In the full exercise of their sovereignity, the adoption of the necessary measures to prevent the activities of the transnational corporations, or any other power source or structure, from contributing to preventing the achievement of the legitimate objectives contained in their scientific and technological development plans, programmes and strategies.

88. Identification and implementation of the measures necessary for obtaining from the transnational corporations or any other supplier technological information, assistance, transfer of technology, and administrative and managerial know-how under just and favourable conditions that can assist the developing countries in carrying out their scientific and technological development plans and programmes.

89. In international forums continuation of the efforts undertaken to prepare an international code of conduct on the transfer of technology that will establish regulations for exchange and co-operation and will take into account the needs and interests of the developing countries with respect for their sovereignity. In this context special attention should be given to the need for establishing a regulatory mechanism to control the forms of technological transfer and direct investment in the developing countries.

90. Elimination of Article 5 "quater" of the Paris Convention, which maintains the validity of foreign patenting even though patents are not used locally and the corresponding product is imported. In addition, no

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attempts should be made to use the system of compulsory licenses as a palliative in dealing with the failure to exploit patents.

The developed countries

91. Co-operation with the developing countries in the creation and strengthening of their scientific and technological infrastructure, in the light of their policies and development plans.

The developed and developing countries

92. Consideration of the feasibility of setting up a financial system for development of the developing countries that would be aimed at financing the scientific and technological activities of these countries in accordance with the guidelines contained in the regional and world Programmes of Action. The system would consist, inter alia, of annual transfers of funds from the developed countries to the developing countries calculated on the basis of a percentage of the average deficit in the balance of trade in manufactured goods of the developing countries with respect to the developed countries. The system should promote joint technological research programmes aimed at solving common problems of the developing countries. In addition, it should be controlled by the developing countries, give preferential treatment to those countries of relatively less technological development and earmark its funds to scientific and technological activities of the developing countries directed at:

(i) Mastery of the know-how required to generate and assimilate the technological processes indispensable for solving socioeconomic problems;

(ii) Development of the capacity for the design and engineering of the processes, equipment and instruments required for technological innovation;

(iii) Development of national capacity for using national or imported technology; and

(iv) Technical and administrative training required for the successful functioning of the technologies.

93. Recommendation that the Conference held to adopt the new provisions of this instrument, in the light of the Declaration and Programme of Action

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on the Establishment of a New International Economic Order,[3] of UNCTAD Resolution 88 (IV), regarding the Paris Convention for the protection of industrial property, and also considering the text of Resolution 2028 (LXI) of the Economic and Social Council[4] should include norms for:

(i) Reviewing the principle of equal treatment with regard to patents, so as to establish preferential non-reciprocal treatment and provisions intended to favour the interests of the developing countries;

(ii) Establishing efficacious provisions with regard to the revocation or lapsing of patents owing to lack of adequate use:

(iii) Reviewing the principle of priority and independence of patents, in particular taking into account the interests of the developing countries;

(iv) Insisting that holders of patents use them in national production;

(v) Establishing that the patent does not confer exclusive rights to import the product or products patented or manufactured using patented procedures. In this context, the importation of the products should not be considered as a use of the patents. The corresponding articles included in the convention should reflect these concerns;

(vi) Modifying the voting system so that amendments can be made in the convention to ensure the exercise of the rights of the developing countries;

(vii) Laying down special norms that will facilitate the access of developing countries to information on the subject proceeding from the developed countries and making possible an effective exchange of information among the developing countries; and

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3/ General Assembly Resolutions 3201 (S-VI) and 3202 (S-VI).

4/ This resolution is connected with the Paris Convention for the protection of industrial property, whose mode of application is at present being studied in WIPO. It is estimated that this resolution, in considering the rights of the persons concerned, does not give adequate recognition to public interests with which it should be concerned.

/(viii) Deleting

(viii) Deleting all clauses restricting the development of the innovative capacity of the developing countries.

(e) The search for and acquisition of technology

The developed countries

94. Adoption of urgent measures so as to abolish the restrictive practices governing the current transfer of technology, and establishment of conditions appropriate for the adoption of guarantee systems by the suppliers of technology.

The international organizations

95. Preparation of a list of experts and advisory and engineering enterprises in the developing countries, and the preferential use of their services in technical and financial co-operation programmes.

(f) Dissemination of scientific and technological know-how

The developed countries

96. The provision of freer and more complete access to all types of technological know-how and to all technologies, not only basic and conventional ones but also the most complex and advanced technologies, such as nuclear technology for peaceful uses, microelectric technology and space technology, under just and equitable conditions acceptable to both parties and with due consideration to the specific development needs of the recipient countries in the interests of promoting the welfare of the majority sectors of the population.

97. Contribution to reactivating world scientific and technological efforts so as to carry out a genuine transfer of resources and know-how to the countries and the elimination of the ties which traditionally burden international co-operation.