

IDRC-060e

Andean Pact Technology Policies

Junta del Acuerdo de Cartagena



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Postal Address: Box 8500, Ottawa, Canada K1G 3H9
Head Office: 60 Queen Street, Ottawa
Microfiche Edition \$1
ISBN: 0-88936-077-4
UDC: 620(8)

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(This work was carried out partially with the aid of a grant from the International Development Research Centre, Ottawa, Canada. The views expressed are those of the authors and do not necessarily represent the views of the Centre.)

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Preface

The Acuerdo de Cartagena (Cartagena Agreement) was signed on 26 May 1969 by Bolivia, Chile, Colombia, Ecuador, and Perú. On 13 February 1973 Venezuela signed the same agreement as well. The six Latin American countries constitute what is known as the "Andean Pact integration process." (In this publication the term "Subregion" will be used to signify the geographical area covered by the six Andean countries.) Jointly they have a population of 73 million inhabitants and a territory of 5.46 million square kilometres. The Andean Pact as a block has a higher level of imports than any individual developing country in the world. In 1974 the Pact's total imports amounted to about U.S. \$8 billion. Such a relatively large import volume, if adequately managed, offers a potential for significant gains from the integration process of the six markets. The gains can result from the proper use of the combined purchasing power of consumption and investment goods and services or of primary inputs or production. Similarly, gains can be obtained through the possibilities of import substitution that can take advantage of large-scale production. Also, in 1974 the six Andean countries jointly had the highest level of exports in Latin America amounting to \$22 billion. Most of these exports were concentrated in minerals, petroleum, and primary commodities. For example, the Andean Pact countries produce 93% of the Latin American output of copper or 14% of the world production. They also produce, in comparison to the total Latin American output, 53% of the iron ore, 81% of silver, 54% of zinc, 98% of molybdenum, 43% of lead, and 81% of petroleum. Fish meal, coffee, and bananas are also important Andean exports.

Among the key policy instruments of the Andean integration process one can list the following: (1) joint industrial programs; (2) a common treatment of direct foreign investments; (3) internal trade liberalization and a common external tariff; (4) harmonization of certain economic and social policies; (5) joint programs in agriculture and livestock. In all these policy areas, as well as in the spheres of economic activity presented in the previous paragraph, technology constitutes a fundamental underlying factor. By "technology" we mean here all elements of productive knowledge needed for the transformation of inputs into products, in the use of these, in the development and rendering of services, as well as in the generation of further productive knowledge. In this context technology and its development are determining conditions of economic and social advancement. Furthermore, technology and its development are not neutral but serve specific purposes; the command over productive knowledge is an important element of economic as well as political power.

Recognizing the role and implications of technology on the process of advancement of societies, the Andean Pact explicitly introduced technology policy as one of the essential components of the integration process of its member countries. This novel approach to integration among developing countries links directly the issue of technology and its policy components to specific economic and social objectives. Within this framework technological development is pursued not for its own sake nor in an indiscriminate manner but rather within a planning context that tends to satisfy selected and specific economic and social needs. It is also recognized that technological dependence, which presently characterizes the Andean Pact relations with the rest of the world, constitutes a transcending and limiting factor for the overall advancement of the Pact's member countries and for the fulfillment of their integration objectives. Contrary to dependence and distinct from autarky, the Andean Pact's goal in the field of productive knowledge is the progressive attainment of a significant degree of technological autonomy. The latter will enable its member countries to overcome certain key restricting factors that tend to condition political and economic decisions as well as the available means of production and thus limit the prospects of overall development.

Importation, assimilation, generation and use of productive knowledge need to be pursued according to their contribution in inducing development and in promoting nondependent decisions from the users of such knowledge.

This publication presents some of the elements of the technology policy of the Andean Pact. It commences with the position paper that was prepared on this subject by the Junta del Acuerdo de Cartagena, the technical body of the Andean Pact. In 1974 the Junta presented this document to the Commission, which serves as the decision-making council of plenipotentiary country representatives. The position paper is followed by three of the Commission's decisions on technology. The first includes a selected number of articles on technology policy from Decision 24, which deals with common treatment on foreign direct investments, trademarks, patents, licensing agreements, and royalties. The second, Decision 84, covers the bases for an Andean technology policy. The third refers to Decision 85, which includes the common regulations for the application of rules concerning industrial property.

The research conclusions that provided the background for the preparation of these decisions have been published as an International Development Research Centre monograph (IDRC-061e) entitled *Technology Policy and Economic Development: A Summary Report on Studies Undertaken by the Board of the Cartagena Agreement for the Andean Pact Integration Process*. IDRC generously made available two grants to the Junta for the research requirements undertaken on these matters in the first part of the 1970s.

Other decisions of the Andean Pact Commission on technology policy, not published here, include two multimillion dollar projects on the hydrometallurgy of copper and the use of tropical forest resources. Further work is presently being undertaken in the Junta on technology policy in the following fields: (a) the production of protein- and calorie-enriched and balanced food substances for low-income pregnant and lactating mothers and for children; (b) an information system to cover foreign investments, technology licensing agreements, patents, alternative sources of technology supply, and needed production knowledge in priority areas; and (c) the management and utilization of a \$400 million technology package that will be needed for the recently approved Andean Pact sectoral development program in petrochemicals.

This publication will hopefully contribute to the knowledge that is necessary for the analysis and implementation of policies on technological development that are appropriate for economic and social advancement. It is also hoped that it will bring the Andean Pact closer to other developing countries that face similar problems in the sphere of technology policy.

JUNTA DEL ACUERDO DE CARTAGENA
Lima, Peru, October 1975

Introduction

One of the key characteristics of the current stage of economic history is the great potential for change that results from the application of science and technology to the production system and the influence that this application could have on economic and social development. The effects that increased amounts of distinct productive inputs have on economic activity can be severely restricted if there are no qualitative changes in processes and if new applications or products are not generated. The stock of available knowledge and its adequate use is, therefore, a decisive factor in the ability of a society to fulfill its economic and social needs and to select strategies in accordance with those needs.

Moreover, the stock of scientific and technological knowledge available to a country, which it incorporates into its production activities, is a power element, and is reflected in the country's relationships with the rest of the world. Technological superiority has political significance and is a key factor in the exercise of power. In relations between countries the subtle line that distinguishes interdependence from dependence fluctuates continually according to the access to scientific and technical advances, and the degree to which advantages are actually realized.

The signatory countries of the Acuerdo de Cartagena aim, through joint action, to increase the rate of development and to improve the standard of living in the region. However, the Subregion does not have the minimum scientific and technological capacity needed for application to production activities. Its dependence regarding knowledge is evidenced by an inability to choose between different technical solutions and to obtain the most suitable in adequate terms. The Subregion has also very limited ability to adapt or to generate knowledge that will lead to the achievement of its economic and social goals. The goals and objectives of Andean development and integration are conditioned and constrained by the present technological dependence.

In response to the mandate of the Acuerdo de Cartagena and to Decision 24 of the Commission, the Junta has prepared an outline for a subregional action program in technology policy, the basis and the content of which are contained in this document. The complexity of the task makes it necessary to progress in gradual steps. For this reason, the proposals are only those strictly necessary for initiating basic action. The Junta believes that these will act as foundations for gradually building up the capacity to carry out action that (although already foreseeable and definable) can only be undertaken once previous goals have been attained. Consequently, subsequent proposals will deal with that action.

Chapter I

Development, Infant Activities, and Protectionism

The development process of a society is characterized by the change of its structures and its progress through such qualitative improvements as the promotion of higher level capabilities of its people, institutions, and production units. It is also characterized by the offer to all its citizens of the opportunity to share, under conditions of social justice, in the fruits of progress and the improved quality of life. Development lays the foundations for sustained and equitable economic growth. Moreover, it enables a nation to enjoy a more autonomous participation in activities of the international community, including a more adequate international division of labour.

During the last two decades most of the Latin American effort to advance the process of economic development, particularly in industry, used protectionism as the main instrument. As the internal production sector was weak and embryonic, it was believed that protection from various forms of external competition would create the conditions necessary for economic development.¹

In Latin America, protectionism had two main features. Firstly, it reached very high levels, which led to grave inefficiency, affecting the proper allocation of the available resources, creating distortions in the economic structure, and having regressive effects on the distribution of income. Secondly, the products themselves were protected, by direct and selective means, rather than those indigenous infant activities in which the enterprises would have required differential treatment during their gestation and formation period. As a result, the benefits of protectionism largely went to foreign factors of production and foreign enterprises. Several studies show that the true profits of foreign subsidiaries in Latin America (if discriminatory transfer pricing payments between subsidiaries are included) reach multiples of the average profits declared in the home country.² Instead of stimulating internal production factors, protectionism generated high profits for foreign factors, and these came to dominate the industrial structure of Latin America.

Possibly even more important in the long run was the fact that the lack of direct encouragement and adequate protection to several local inputs led to their displacement by foreign factors of production and foreign enterprises. This displacement took several forms. On the one hand, many local enterprises were bought by foreign concerns.³ On the other hand the foreign enterprises use many critical and domestically scarce local resources, including the local savings. As a result, domestically owned or controlled activities may suffer serious supply problems. In addition, the acquisition of some necessary inputs is often tied to the import of

¹ The application of various protectionist measures with relative success characterized part of the development process of Western Europe and the USA in the last century. Similarly, protectionism played a critical part in the development of the Japanese economy and also in European reconstruction after World War II.

² A recent study for the U.S. Department of State, published by the RAND Corporation, registered average rates of return on capital for foreign investment in Latin America as high as 40%. (RAND. *Latin America in the 1970's*. Santa Barbara, California, RAND, R-1067-DOS, Dec. 1972, 127-146.)

³ Information from a survey undertaken in the USA indicated that approximately one in every three North American investments in the manufacturing sector in Colombia and Peru between 1958 and 1967 was undertaken through the acquisition of local enterprises. Detailed studies in Central America have revealed that the great majority of such purchases did not lead to significant changes in structure or in the scope of activities.

others, which displace existing national inputs or limit the development possibilities for other (new) activities. Some of these tied inputs (for example, engineering services) are not exclusively used in projects in which the foreign companies specialize, but have applications in many other economic and social areas. Therefore, the lack of development has a high opportunity cost, a cost that exceeds the benefits that could be obtained through direct participation in projects with foreign factors.⁴

In conclusion it can be said that despite the fact that the development process requires special protection for indigenous infant activities until they become efficient, the selection of methods of protection and their application are critical for development. If they are inadequate, society pays the costs of protection in vain. Moreover, the use of the protection margin by foreign enterprises not only generates losses by high remittances abroad, but also displaces local factors and keeps them in permanent backwardness. In the case of the Subregion, technological capacity may be considered as the least-developed factor of production.

Technological Dependence and the Development Process

The capacity of a society to assimilate, adapt, improve, and create scientific and technological knowledge, and to use it efficiently in production activities, is based on three interdependent elements. In the first place, there is the knowledge to which a society has access and can use. This knowledge, defined in its broadest sense, encompasses "to know-what, to know-how, to know-why." The second element is the availability of people able to understand and use the knowledge in production activities. And the third element is the structure and efficiency of the institutions concerned with scientific and technical progress and its application, namely:

(a) centres that generate or assimilate knowledge (institutes, research and engineering departments, etc.) and those that disseminate knowledge (consultancy firms, information and industrial extension centres, etc.);

(b) users of such knowledge (production enterprises) and their functional link (via the market or in other ways) with the centres mentioned under (a); and

(c) the institutional and legal framework or system, predominantly in the government sector, whose functions include the establishment of priorities, the allocation of resources, and the regulation of, or direct participation in, the interaction between the factors mentioned under (a) and (b).

This complex set of factors is at an early level of development in most of the Subregion. The resulting gap has led to marked technological dependence, with serious economic and political repercussions.

The *symptoms* of this dependence are, among other things: (a) the ratio of imported knowledge to the production needs of the Andean Group; (b) the need to import this knowledge, not as a result of a selection based on relative efficiency but as an absolute need; and (c) the one-way flow of knowledge without the ability to engage in its exchange, which arises from the lack of specialization in development and management of such knowledge.⁵

The *effects* of the unsatisfactory relationship with other countries as regards technology are: (a) the loss of control of decision-making in programming, production, and marketing; (b) the frequent import of inappropriate knowledge — inappropriate in terms of inputs and the type of demand created; and (c) the reduced negotiating power of member countries in the purchase of technology.

There are many *causes* of the present situation and they must be understood within the general context of the constraints to development. However, there are specific issues that are related to policies (or the lack of policies) for science and technology in the Andean countries, and these contribute heavily to the scarcity and inefficiency of the qualitative changes and use

⁴ This subject will be dealt with more extensively in Chapter II because of its importance in technological development and the need to diversify the technological capabilities of a country.

⁵ The United Nations Conference on Trade and Development (UNCTAD) has carried out several studies on the definition and quantification of these concepts.

of knowledge in production activities. These issues can be grouped in the following three related categories:

Orientation of technological development efforts

The scientific and technological activities⁶ carried out in the Andean countries have been concentrated on the exact sciences and pure research, which, although important, do not cover the whole spectrum of the components of technological development required to satisfy specific social and economic needs. There are instances within the Andean Group where roughly two-thirds of the total research and development personnel are in the universities or centres that carry out academic research, particularly in the natural and medical sciences. On the other hand, less than 9% of the total are working in industrial research.⁷

The process has created important and essential human resources that, however, are not being properly utilized in the member countries. As a result of this, and of the relatively low aggregate demand for local technology originating in production activities in the Subregion, two types of brain drain are occurring: an "external brain drain" (for example, the Andean countries export engineers and import engineering); and secondly, an "internal brain drain" due to the employment of professionals in activities little related to the economic and social development effort.

Therefore, a policy for correcting the current state of affairs cannot simply be reduced to increasing funds for scientific and technological activities, even though they are at present insufficient. It is necessary to attach more importance to: (a) where such funds are spent; (b) developing the capacity of the people, enterprises, and institutions that utilize scientific and technological knowledge to solve concrete economic and social problems; and (c) the specific consideration of scientific and technological inputs by those who plan the economic and social development policy.

In the past 2 or 3 years, important steps have been taken in some Andean Pact countries toward a more suitable orientation of technological development efforts. For example, legislation,⁸ administrative processes,⁹ and operations by special organizations¹⁰ are promoting the incorporation of science and technology into the efforts to attain economic and social goals.

Importation of technology

The lack of internal technological capacity has resulted in the importation of a significant flow of foreign technology. The absolute volume of technology that enters a country does not necessarily imply a disadvantage to the importer, even if the volume is considerable. For proper evaluation of the effects of foreign technology, two additional structural elements need consideration. Firstly, whether the imported knowledge has encouraged or substituted local technological efforts must be ascertained.¹¹ Secondly, the uses of foreign technology and its net

⁶ By "activities" we are referring not only to research and development at the laboratory stage but also to the worldwide searching and negotiating of knowledge, the assimilation of knowledge, the acquisition and use of information, training people in related areas, auxiliary services such as industrial extension and standardization, etc. For a definition of what is understood by scientific and technological activities, see page 23.

⁷ Concurrently, more than half of the members of the executive council in charge of setting the priorities for the national council of science and technology of that country were representatives of the science establishment, with very little direct linkages with the process of planning and implementation of social and economic policies.

⁸ See for example, Articles 14 and 15 of Decree 18350 of the Government of Peru and Articles 131, 132, 133, and 134 of the bylaws of that Law.

⁹ This refers to recent efforts in Venezuela to use part of the income generated by oil to finance scientific/technological activities connected with the production process.

¹⁰ Chile and Colombia have made serious attempts to involve research institutes (i.e., INTEC (Research Institute of the Corporación de Fomento de la Producción), and ITT (Instituto de Investigaciones Tecnológicas)) in the evaluation and control of foreign technology and also to give specialized advice on science and technology.

¹¹ For example, in the case of Japan, it has been established that those activities that import most

effects must be examined. The answers to these questions, in turn, determine the capacity of a society to attain the level of technological development that will satisfy its economic and social needs.

A key feature of importing technology into the countries of the Andean Group is the “packaging” of knowledge. In many instances, although it would be necessary to import some knowledge from abroad, the remainder already exists or could be internally developed.¹² As a result, the technical inventive capabilities of the importers are displaced, or do not develop, through lack of technological diversification in the local economy. More than specific skills, the capacity to innovate, by synthesizing different technologies so that they become appropriate for local production processes, is displaced.¹³

Consequently, foreign knowledge is applied without being absorbed by the internal technological infrastructure. This present process of technology importation can be considered to be a pseudotransfer of know-how.

The use of imported knowledge has several effects. In the first place, it frequently ignores the internal factors of production and resources available locally. The increases in production achieved with inappropriate technology — inappropriate means to inappropriate products — tend to conflict with certain basic development objectives, such as the level of employment.¹⁴ Likewise, the export of products manufactured with imported technology (essential to integrating the national economies with the rest of the world) is severely restricted by the terms under which technology is made available.¹⁵ Moreover, the need to import essential knowledge from abroad (without having adequate legislation of foreign investment¹⁶), when added to the present patents system, leads to economic and political power being concentrated in foreign centres, whose objectives and interests do not coincide with those of the recipient countries.

If the different forms of economic relationships of the member countries with the rest of the world are evaluated, we may conclude that the technological factor is the key element in this dependence. For example, between 1961 and 1969 the financial contribution of direct foreign investment was less than 5% of total investment registered in Latin America. The remainder was basically provided from local savings.¹⁷ On the other hand, in 1971 more than half the Andean Market consultancy services were provided by foreign consulting firms. In the manufacturing sector and in large mines, external technological inputs frequently exceeded 90% of those utilized.

In addition, there are many direct economic costs to the Subregion resulting from the high degree of dependence on foreign technology.

foreign technology also have allocated to them most of the local scientific and technological efforts. The import and adaptation, or creation, of knowledge complement each other.

¹² Often the import contracts for technology explicitly stipulate that the recipient must not use another technology that competes with the suppliers', whether the knowledge be local or foreign. In this way imported technology inhibits the development of local technology.

¹³ Studies by the Organization for Economic Cooperation and Development (OECD) on “gaps in technology” between countries indicate that the American advantages in this field did not originate so much in the strictly technological field but more in the ability to synthesize and incorporate technologies from different sources (frequently external).

¹⁴ Several of the studies carried out by the International Labor Organization (ILO) prove that technological advances from developed countries (for instance, automation, the types of new products introduced, or the required scales of production) involve production techniques that replace labour with capital or reduce the use made of both (but particularly labour). In the 1960s, large copper mines that wanted to be efficient and competitive in the international market required investments that created directly less than six jobs per million dollars invested.

¹⁵ An exhaustive analysis of several hundred contracts for the purchase of technology in the Andean Group has been undertaken. It contained information on the possibilities of exporting products manufactured with imported technology. It was verified that, in the case of companies owned locally, more than 90% of the contracts contained clauses restricting exports.

¹⁶ Following the approval of Decision 24 by the Commission, basic measures were introduced in member countries.

¹⁷ Again, according to data from the U.S. Department of Commerce, in 1968 only 12.5% of the

Firstly, the forecast for explicit payments for technology (royalties for licenses and patents) going outside the Subregion in 1980 are put at approximately U.S. \$290 million.¹⁸ If payments for foreign consultancies are included, the amount would exceed \$350 million. To these payments should be added remittances of profits by subsidiaries of foreign companies and whose incomes are not based so much on their capital contribution (see the above figures) but on their contribution of technological, managerial, and marketing expertise. To the extent that integration might result in the development of new industries with a high technological content, explicit payments for technology would increase more rapidly. For example, it is estimated that cumulative payments up to 1985 for licenses and services for petrochemical development would amount to somewhere between U.S. \$200 and \$300 million.

Secondly, indirect payments for technology included in the price of intermediate products and capital goods (whose purchase is often a condition of the sale of the technology) seem to be even larger than the direct payments for licences and patents. In 1970, the capital goods and intermediate inputs imported by the Subregion totaled U.S. \$3500 million. A considerable proportion of these imports can be attributed to two sources directly or indirectly connected with technology: (a) payments for the professional services and knowledge used to produce these goods, which seriously affect the terms of trade for countries that import raw material and semiprocessed products, using unskilled cheap manpower to obtain goods of high technological content; (b) differential payments stemming from the monopolistic profits the suppliers can obtain through their technological dominance. Several studies carried out by government agencies in the member countries and the Junta have confirmed severe overpricing of inputs imported by, and underpricing of exports coming from, the Subregion in those instances where foreign technology and control were dominant.¹⁹

Relationship between the technological infrastructure, sectors of the economy, and governmental activity

Knowledge-based comparative advantages are created, not given. One of the main determinants of how successfully technological knowledge is generated and applied to production activities is the type of commitment and institutional relationship between those who define policies for development, those who carry them out, and those who produce and absorb the technological inputs that development requires.

Studies carried out in the Subregion indicate that, in many instances, the technological infrastructure is isolated from the other two parts of the production system. The planners and executors of economic and social policies have seldom consciously and explicitly introduced and utilized science and technology policy as a critical instrument to reach development goals, as has been the case with monetary policies, fiscal policies, the physical infrastructure, etc. Institutionally, science and technology policy is divorced from direct economic and social development efforts.

Andean enterprises, because of structural and orientation problems and their relatively small size, have not always developed their own engineering capacity or that of assimilating, generating, and managing technology. (See the above comparative figures for costs of research and development.) The resulting vacuum creates a demand not for local professionals or consultancies (and even less for Andean technology institutes) but for foreign technology. (This technology is directly linked to, or even promotes, specific patterns of consumption; is associated with internationally recognized manufacturers; enjoys preferential treatment from licensees; is bound by financial ties; etc.)

finance for foreign subsidiaries operating in Latin America came from the parent company. The rest was financed with funds generated within the host country.

¹⁸ This figure is reached by assuming an average of 0.5% of GNP as direct payment for technology. The rate applied for Brazil is 0.75%.

¹⁹ Overpricing in 1969 in the imported inputs for one sector alone (pharmaceuticals) of one member country almost equaled the total direct payments for technology made by all manufacturing sectors in that country.

Owing to the lack of both local demand and clear objectives, technological institutes frequently function as “island institutes,” having more links with academic activities in other countries than with local economic and social needs. Studies undertaken by the Junta indicated that, although the professional skills exist, most of the institutes have few links with government or industrial planning. In exceptional cases (for example INTEC in Chile, IIT in Colombia, ITINTEC (Instituto de Investigación Tecnológica y Normas Técnicas) in Perú) the reorientation came about through specific measures and institutions,²⁰ which created a concrete demand for the services of such institutes, so that they became directly concerned with carrying out specific (socioeconomic) development activities.

Finally, there exists an important factor that does not so much refer to “*production technology*” (i.e., the knowledge essential to transform inputs into products or services) but more to “*consumption technology*.” This refers to the characteristics of the goods and services that satisfy, or induce, requirements at the consumer level.²¹

Every product or service has features that reflect the multiplicity of consumer or investor motivations. These result from cultural patterns and historical evolution, from revenue and market size, views on what constitutes a high quality of life, status within the social or economic unit, etc. The consumption patterns, or the type of industrial structure, just as other elements of “knowledge,” can be learned.

The formation of preference patterns is partly influenced by the relations between people, societies, or countries. Moreover, countries importing production technology also receive the suppliers’ “consumption technology.” In this way, both types of technology (production and consumption) are interrelated and each creates the conditions for the other.

In conclusion, the three broad categories mentioned above — namely, the inappropriate orientation and type of internal technological development; the indiscriminate importing of foreign technology with its associated costs; the very limited links between the technological infrastructure and the government and economic sectors; and what we have referred to as “consumption technology” — have created a severe technological dependence that holds back the development process. As a result, the Subregion must bear a high opportunity cost in a factor that is critical to growth: the mastering and application of science and technology in production activities. Internally, this indicates that urgent needs are going unfulfilled. Externally, the Subregion maintains its dependence, and exchanges products that have a small added value for those complex products that involve paying for sophisticated production factors that enjoy monopolistic profits.

The Need to Program Technological Development

World advances in knowledge are so profound, multiple, and complex that no small country can hope to master all aspects of it. Also, knowledge and particularly that used in the production sector, is not created in a vacuum, but is generated as a function of the conditions and characteristics of the societies that wish to use it. They result from consumer requirements, from the structure of production factors, from market size, from the need to have commercial and political power — i.e., from the characteristics of the countries themselves that create it. It is estimated that, of the total worldwide expenditure on research and development (which represents only a part of the resources channelled into generating scientific and technological knowledge), less than 1% is specifically channelled into the solution of the problems of poor countries. The remaining 99% is accounted for by the requirements and demands of advanced countries, which may or may not be related to the needs of developing countries.

²⁰ For example, the creation of contractual relationships for undertaking specific technological projects between the Government or enterprises and technological institutes; the participation of representatives of these institutes on committees that negotiate imports of foreign technology; the strong participation of government and industrial representatives on the boards of institutes; the evaluation of research projects with regard to their impact on social and economic needs; etc.

²¹ For example, a food product has characteristics beyond nutritional value and flavour, such as presentation, packaging, advertising image, status implications for the consumer in relation to others who also use the product, etc.

The scarcity of resources inevitably leads to the need to identify priority technology sectors. And these sectors must, of course, be connected with the primary requirements of the country, its development goals, and the types of specialized production it has chosen. In other words, *the order of priorities for action in the technology field must be defined as a function of decisions that are implicit in the general development plans.*

Apart from the factors previously mentioned, the lengthy periods of time required to train specialized staff and to fully develop the capability within institutions to manage, assimilate, and produce knowledge, lend weight to the need of global planned efforts in the technology field. Unless technological activities are related to production as a part of the overall development plan, serious discrepancies could arise between their goals.

Moreover, as the process of "learning by doing" occurs in infant activities that require protection in order to grow, explicitly defined and programmable support areas must be identified so that protection generates efficient capabilities to work toward selected goals.

Lastly, the market imperfections in the technology generation and trade are not of the type to be corrected with the traditional self-correcting mechanisms; special policies are called for. Some of the most important imperfections are as follows. Knowledge as such does not fade with use; on the contrary, once acquired, its usefulness can increase with an enhanced understanding of the principles involved. These characteristics lead to severe differences in relative cost and power between, on one hand, those who do not have (and wish to acquire) knowledge, and on the other hand, those who have knowledge and can use it over and over again without it fading.

The presence of this type of difference in the relative cost structure, added to the great differences in the possession and exercise of economic power in the world, are critically important to countries that basically depend on foreign contributions for technological inputs. Because current market forces frequently tend to accentuate differences between countries, it is necessary to make the corrective measures explicit.

At the same time, this "nonwearing" aspect of knowledge brings with it the implications of fixed and concentrated²² expenditure to develop, adapt, and assimilate knowledge. Later, the additional costs for repeated use are minimal. For this reason, as in the case of national security or the building of a bridge, there are specific areas of technological development into which society should channel resources for an initial effort, thus in turn generating capabilities or knowledge for the benefit of its citizens.²³

There is nothing automatic about selection of these areas; selection employs criteria and decisions reflecting the order of priorities for a country's development. Also, decisions involve commitments, political and otherwise, long before the benefits can materialize. Finally, the existence of requirements (other than those of technological development) that compete for scarce resources implies the need for programing.

Technology Policy and Subregional Integration

The member countries have adopted a joint policy for development in several areas that, because of their content and scope, imply a geometric progression in the need for science and technology. The process of Andean integration not only aims at bringing together national markets and generating new scope for production, but also aims at putting the capabilities derived from this joint action at the disposal of each of the member countries, particularly the least developed. In this way new possibilities are opened for the utilization of technology that were previously denied to each country because of the small market and level of economic activity.

The Subregional technology policy arises not only from a need to attain the objectives of economic and social development, but also from the opportunity presented by the process of

²² In a survey in the USA in 1964, 28 of 2130 enterprises investing in research and development accounted for 62.7% of total expenditure of the enterprises; 1500 accounted for only 3.7%.

²³ Studies of the 1960s done by the OECD indicate that, in the USA, enterprises devoted only 6.5% of their total research and development budgets to basic research. Moreover, 35% of the funds used by U.S. enterprises for basic research were provided by the federal government.

integration itself. Developing countries face common problems with technology, and the growing interdependence of the Andean economies, especially in the areas covered by Subregional integration projects, creates common interests and specialization requirements at the national level.

Thanks to integration, industrial possibilities arise for each member country that would not be possible if each one were developing alone. These industries are, in most instances, more complex and technically demanding than those that existed before, and consequently provoke a greater demand for knowledge. This demand can be more easily met if member countries pool their resources and capabilities.

The six countries together have more resources at their disposal, not only in terms of quantity but also in terms of range. One of the key elements in the technical development process in industrialized countries is the diversification of their technical capabilities and resources. The existence in a country of specialists in one type of knowledge can be very useful in carrying out projects in others, even in areas that might appear at first sight to be alien to their specialization. Integration of technological capacity of the Andean Subregion would have far-reaching effects that would exceed the apparent sum of the component factors. This integration would also make possible the training of specialists who would be redundant if trained for one country alone.

In addition, the execution of some scientific and technological activities implies high fixed costs, whereas only a minimal additional effort would be necessary to extend their use to several countries.

A subregional technology policy would avoid the duplication of resources in each of the member countries. (Decision 24 has already stressed the importance of information systems regarding technology and foreign investments.) There are also scientific and technological activities that, through their requirement for scarce resources, might not be feasible for one country alone, regardless of their importance to the development process. Combined efforts, shared costs, and coordination at a Subregional level would help to overcome these individual constraints.²⁴ The realization of multiple intercountry projects in the Subregion, as a whole, would reduce the risks and uncertainties that go with the search for new knowledge.

Finally, a subregional technology policy would increase the negotiating power of each of the member countries, which could present a united front when purchasing foreign technology. Technology represents a key part of the knowledge necessary for many industrial activities, and proper means for its acquisition are an important element in the advancement of both internal technological capacity and the total development process.

²⁴ Decisions 86, 87, and 89 of the Commission of the Andean Pact. These Decisions refer to the Andean Projects for Technological Development in the areas of the hydrometallurgy of copper and of the tropical forest resources.

Chapter II

The efforts that a society must make to increase its own capabilities and to advance (a) basic knowledge and the principles involved; (b) the application of this knowledge to specific methods and instruments, and to the development of processes or industrial systems; and (c) the educational and learning requirements, both formal and through experience, are highly interrelated and difficult to separate from each other. Moreover, each of these three categories of knowledge provides inputs that allow the others to develop. Equally, the advancement of any one creates demands that require the development of the others. For all these reasons a society needs to face each and every one of these challenges — these advances in science and technology and education — to attain its multiple objectives.

This document covers only a part of the efforts needed for developing the Subregion with respect to knowledge. Similar action should be taken in the future in other areas, particularly within the context of the Andres Bello Agreement, for the Subregion's coherent development of the human, institutional, and industrial infrastructure in the field of promotion and use of different types of knowledge.

Technological Development Objectives, Priority Areas, and Activities

Objectives

The Subregion technology policy will include a set of guidelines for action and criteria for decisions and choice of means. These should ensure and regulate the constructive incorporation of technology into subregional development.

Subregional technology policy should develop (i.e., be explicitly formulated and carried out) over time. To achieve this, it will be necessary to program and carry out activities aimed at specific objectives, following an agreed-upon timetable. The policy will thus be expressed as a sequence of proposals.

The specific objectives of this policy are: (a) to strengthen the capacity to select and use the technological solutions most suitable for subregional development, bearing in mind our economic and social conditions; (b) to gradually overcome internal and external technological constraints that affect the freedom of decision-making in the development of member countries.

It will only be possible to attain these objectives to the extent that member countries adopt essential policies at a national level and encourage activities that will tend to combine human, financial, technical and infrastructural resources in fields such as:

- (a) planning of technological activities and of those specific ones more directly related to economic activity;
- (b) the establishment of measures to stimulate the creation of technology in the Subregion;
- (c) the evaluation and selection of imported technology;
- (d) incentives to imitate, adapt, and assimilate foreign technology;
- (e) the search for, and diffusion of, information about technology available in the world, and the conditions under which it may be traded, thus facilitating the selection of foreign technology as well as its adaptation and assimilation mentioned above.

Priority areas

Areas of social interest — The Subregional technological development effort could not encompass the entire range of modern knowledge. The standard of living of the vast majority of Andean population, which currently has a very low income, necessitates selecting and focusing on problems related to nutrition, health, and housing. Progress in these areas is a highly significant factor of the true distribution of benefits within a society. Similar considerations lead to particular importance being attached to the effects of technology on employment. Social considerations and employment problems underline the importance of technological development in relation to the promotion and improvement of agricultural activities.

Traditional exports — Another priority task would be the improvement of the competitive standing of traditional exports, together with mastery of the possible techniques involved in substitution.

Improvement of activities that could lead to new exports — The growing significance of knowledge in the added value of manufactured products means — if increasing strangulation in foreign trade is to be avoided — the production of some types of complex goods. The joint effort in technological development should contribute to the establishment of stable specialized industrial capacities, and for this there should be close coordination with industrial development programs in different sectors.

Some of these priority areas may contain conflicting elements, such as occur in the need firstly to increase the efficiency of some areas to compete in international markets, and, secondly, to maintain a high employment rate. However, areas of interest should be identified so that progressively, selectively, and considering limitations of scarce resources, technology comes to be regarded as a factor in the achievement of national goals.

Technological activity

This intangible production factor encompasses various aspects that should be explained to clarify the meaning of the concept as used in this document. These include:

Management of technology — This involves the generation of knowledge and criteria for planning, evaluation, control, and management of technological activities.

Absorption activities — These cover several forms of search, selection, and evaluation of foreign technology and assimilation of knowledge.

Generation activities — These include the types of scientific and technical activity involved in the creation of new products or processes, or the adaptation of existing knowledge to local or specific requirements.

Auxiliary activities — Covered here are information systems, resource identification, the establishment of technical standards and quality control, among other things.

Training activities — These include formation of human resources through apprenticeship in scientific and technological activities.

This perhaps incomplete listing of the aspects that (for the purposes of this document) are included in the expression "technology" shows that a policy for technological development cannot be strictly limited to technical and scientific aspects alone, but should include a broad range of knowledge and activities.

This enumeration does not include tasks related to formal education nor scientific activities that are not directly linked to economic activity. Although both subjects are closely linked with those that specifically interest us, they come under the mandate of another Andean integration organization, the Andres Bello Agreement.

Strategy for Technological Development

The need to control technological progress in a society is not evident or explicit until countries have advanced some distance on the road to development. In the early stages, industrial installations and equipment, processing plants, power plants, etc., are acquired as a whole, without the buyer having a clear idea of which parts of the purchase are really necessary,

which parts are most important, and how the whole procedure affects the utilization of the country's resources.

Economic development brings with it a change in the technological internal environment, leading to more analytic judgment in investment and production decisions. Finally, the more advanced countries reach the point where they can derive their own solutions to technological problems: they are capable of designing and building equipment, of developing production processes, and of obtaining the knowledge they need by selling other knowledge, or through selling products that contain this knowledge.

The step from one technological stage to another was the result of several independent events in history. Traditionally there was no planning; technology was the result of a set of circumstances that, in some instances, proved favourable. However, more recently, and particularly in the last 50 years, the upgrading of national technological capability as a main factor in economic processes has become a conscious and planned effort.

Progressive approach and definition of stages for a subregional technological development policy

First stage — There are internal constraints in the Andean countries hindering the adoption of the effective measures necessary to encourage technological development as a function of national needs. One of these limitations results from the fact that, even if science and technology are considered influential factors in national development, this belief is not translated into concrete measures to incorporate them into national plans nor does it raise an immediate concern to industrial units. The time that must elapse before obtaining results, with the associated commitment of resources, means that science and technology are considered to be long-term investments, beyond the financial capacity of developing countries. Consequently, responsibility for the theoretical aspects of science and technology is delegated to the academic world, and the operational aspects to foreign enterprises.

To overcome the above described conditions there will be need, during the first stage of the subregional technology policy, to undertake specific tasks and projects. The basic objective of these will be to provide practical and concrete demonstration of the facts that adequate management of the technological factor (a) is possible in countries such as those of the Andean Group and (b) is highly warranted in view of the possibility of obtaining, in a relatively short term, significant production and productivity improvements that in turn imply high returns on the resources dedicated to technological development, and (c) is necessary to overcome important social problems.

Also during the first stage, efforts will be undertaken to reenforce or establish the operational and institutional links needed between centres, enterprises, or organizations that create technology, institutions that shape and carry out economic and social policy, and enterprises or economic units that use productive knowledge in their operations. To those ends, specific projects will be undertaken, incentives will be used, and national groups will be formed for the basic purpose of promoting and utilizing the technological factor for economic and social development.

In other words, the first stage will consist of an awareness of the importance of the problem, the strengthening of the technological infrastructure, and the accumulation of practical experience by institutions in the Subregion.

Second stage — Once the first stage has been completed, which could take about 3 years, member countries should evaluate the progress and efficiency of the instruments used. This evaluation will form the basis of activity in the second stage, which will include at least two concrete actions.

The first of these would consist of stabilizing and consolidating instruments and procedures that had proved efficient. The second would consist of establishing financial mechanisms to promote projects of subregional interest in a long-term and systematic manner.

The strategy

A technology policy that seeks to attain the objectives mentioned above should act simultaneously on three specific and interdependent fronts: (a) the importation and process of commercialization of technology; (b) the assimilation and proper management of knowledge by potential users; and (c) the adaptation or improvement of existing knowledge as well as the generation of new knowledge. These three areas require the backing of certain auxiliary activities, which complete the different elements of technology policy. Among these, the role of information, its uses and analysis, must be stressed.

The lack of coordination and simultaneous action in the areas indicated makes it impossible to achieve adequate technological development. To import knowledge without assimilating it, even if the flow is controlled, means that there is no real transfer and this leads to technological dependence. To generate knowledge independently, without making use of what exists in the rest of the world, would be an impossible task, and, even if feasible in certain areas, would be inefficient and expensive. To assimilate for the sake of assimilating, without considering the possibility of creating or improving local knowledge, is equivalent to leaving unfinished the process necessary for achieving technological development; the opportunity is lost to encourage technically qualified personnel, or to develop manpower or institutions that could make good use of the knowledge and progress found in other countries.

There must be, therefore, a symbiotic relationship between the three action areas of an efficient and coherent technology policy. In this way, importing technology complements local creative efforts.

Importation of Technology

A great number of industrial activities in the Subregion will depend for a long time on foreign technological inputs. Furthermore, there will always be a foreign technological contribution to interest the Subregion. From this arises the need to deliberately take action related to the process of importation and commercialization of technology. In this process, there are three facts that prejudice the interests of the developing countries and that should be considered in a policy for technological development.

The first consists of the serious imperfections in the technology market; these result from its concentration and the unequal negotiating power of suppliers and buyers. The need to adopt specific corrective measures led the Andean countries to approve certain clauses of Decision 24 that must be strictly complied with.

The second is the passive attitude of most of the countries toward the range of opportunities offered by the rest of the world in the way of knowledge. Instead of looking abroad for alternative technological solutions and suppliers, the Subregion has generally waited for suppliers to take the initiative and offer what they have to sell under terms that suit the suppliers best.²⁵ Generally speaking, technology obtained in this way is not the most suitable, nor indeed are these the most convenient conditions of purchase. An international search must be made for technology in priority areas, through efforts linked to specific investment projects to obtain the best advantage from what is available and accessible. Information thus obtained can, and should, be used in planning and in carrying out projects.

Finally, there is need to correct the traditional practice of buying complete packages of technology, including components of varying complexity, some of which could be obtained locally. Local participation is severely inhibited or made impossible by the practice of tying together various components such as equipment, intermediate goods, and other inputs. Also, the control over, and ownership of, core technology in industrial activities puts the supplier of equipment or processes in a powerful negotiating position. When the seller makes use of this

²⁵ Studies by the Corporation for Development (Corporación de Fomento) in Chile have shown a very narrow range of sources for the technology imported by Chile. In many industrial sectors, more than 90% of knowledge came from one or two countries, although this knowledge (due to its age) was available from most of the industrialized world.

negotiating power by delivering sealed packages of technology, he includes, at prices higher than normal, certain related peripheral technologies. This happens despite other suppliers being available.

For these reasons, one of the fundamental measures of technological development policy is to break up (unpackage) technology and separate the required elements from other inputs tied to its purchase. This disaggregation has direct and important effects on the cost and import structure, as well as on the assimilation, adaptation, and generation of technology.²⁶ Because of this, it is proposed to act on the process of importing technology with two aims in mind:

(a) to control the entry of technology so that, through opening of the package and consequent strengthened negotiating capacity, member countries may select suitable technology under convenient terms; and

(b) to generate a clear and directed demand for those national capabilities already in existence, such as building of the equipment industry and engineering projects, consultancy firms, research institutes or departments, and the encouragement of their activities.

Assimilation of Technology

In subregional universities, research institutes, large enterprises, and engineering firms, the capacity already exists to generate technology²⁷ and even to generate and direct certain projects and to build and install industrial plants. This capability is not fully employed, nor, given the lack of a sustained demand, is it likely to expand.

As indicated above in the case of importation of technology, detailed analysis of selected projects would indicate which components of productive knowledge or of other imports could be provided or produced locally. This in turn could create a sustained demand for existing capabilities and so promote the necessary conditions for technological specializations needed in the priority areas established by the economic development plans and technology policies. Some experiences have shown that, once national suppliers of technology are established and have consolidated their position, they become pressure groups that assist in the creation of internal demand: this permits increases in the value added of the industrial sector.

Thus a national capacity is established and, as it grows, it complements the imported technology; similarly the nations' capacity for assimilating foreign knowledge increases progressively and, step by step leads to the replacement of imported technologies and the reduction of the noxious dependence of the past.

A step that helps create favourable conditions is the systematic surveying and use of information on the existing national capabilities in each of the technological activity fields listed previously, together with efforts to keep the Subregion up to date on worldwide technological development in priority areas. In this way the information system supports and links the international search for knowledge and the policies for importing, assimilating, adapting, and creating technology.

²⁶ Specific examples of the critical importance of disaggregation appear in: Junta del Acuerdo de Cartagena *Desagregación del Paquete Tecnológico*, document J-GT-11, Junac, Lima, 1974. (The words "breakdown," "unpackaging," and "unbundling" are also used to describe "disaggregation.")

²⁷ In this document the term "the generation of technology" means not only the creation of new knowledge but the assimilation or adaptation of technology that, although in existence in other parts of the world, had not previously been mastered.

To imitate, modify, and improve existing knowledge is universal practice in the process of acquiring and utilizing the experience available on the international market. For example, studies carried out in the petrochemical industry show that during the periods that various developing countries imported the necessary know-how, only 1% of licenses granted belonged to the original innovators, whereas 99% belonged to imitators.

Creation and Adaptation of Technology

A fundamental aspect of the technological development policy will be the generation of Subregional solutions to problems identified as meriting priority through the allocation of resources and the establishment of ad hoc procedures. Together with the generation of knowledge, a systematic adaptation of knowledge existing abroad should be initiated to meet the requirements and conditions of member countries. These creative and adaptive activities must be concentrated on economic and social priority areas, and particularly on those of strategic importance to the economies of the member countries.

Also, for the Subregion to have a capability to interpret, assimilate, and utilize new knowledge — whose rate of growth and accumulation might be quite rapid — teams able to keep up to date on the scientific and technological development in the priority areas must be set up. The recruitment of the highly qualified personnel required largely depends on the opportunities offered them for creative work. These teams should exist in industry, universities, and research institutes, with close links between each other, and with economic and social policymaking organizations.

As a first stage within the framework outlined above, certain joint research projects are proposed at the subregional level using the guidelines set out in Chapter III.

Information Systems

In each of the areas mentioned — importation, assimilation, and generation of technology — there is a growing and indispensable need for information about where to find knowledge, what its technical and economic characteristics are, and what the conditions for its use may be. Without a sufficient and correctly timed flow of this type of information there will be a serious reduction in the capacity of a society to make proper use of the technological factor to attain its economic and social goals. For this flow to be available, a system such as the one described at the end of Chapter III must be set up. Its main features are:

(a) The information must satisfy real needs in implementing policies for importing, assimilating, and generating knowledge, with specific economic and social goals. It is therefore not a case of indiscriminately acquiring and storing knowledge, or even seeking information that might be of use one day in the future. What is proposed, in contrast, is the maintenance (through a minimum of documentation and knowledge of information sources) of mechanisms through which relevant information can be obtained when needed by decision-makers in technology policy or by those who use scientific and technical information in production activities, or in the development of new knowledge that has practical applications.

(b) The system should take several forms, according to the type of users — institutions, industry, or persons. In some instances, defining and recording the availability of information will be necessary (information about information); in other instances, there may be an exchange of data between institutions through enquiries or cooperation between them; there may also be specific requirements for coordination, at a national and subregional level, between different decentralized information systems. The effectiveness of the system and the interdependence of its components are what matters.

(c) Given the degree of functional and geographical diversity, the information system must be built up progressively, as requirements for information diversify and grow, while also devising and introducing mechanisms to satisfy these demands.

(d) Finally, it must be remembered that information is not neutral and that the power to manage it generates the capacity to have a determining influence on policy decisions. Knowledge is power, and therefore, the information system must be controlled by and become the responsibility of member countries and their integration agencies; it must not remain the domain of others. This does not exclude information and assistance from external systems and organizations; but the power to reach decisions on the relevance, opportunities, and manner of cooperation should come from within the Subregion.

Chapter III

Subregional Technology Policy Instruments and Stages for their Application

On Importing Technology

(A) Policy Instruments

Instruments relating to importing technology, established by Decision 24, will be complemented and perfected through specific projects and policies to unpack technology; through the international search for technology in specific instances; and through criteria for the evaluation and selection of technology.

Instruments for importing technology as established by Decision 24 — (1) Registration, control, and approval of all contracts for buying technology with participation of relevant national offices in the negotiations; (2) Establishment of a buyers' price for foreign technology and of conditions under which it will be bought, so that total payment is equivalent to the value of the imported technological input. To this end, the contractual value of each element in the transaction, including intermediate products and capital goods, must be stated; (3) Establishment of legislation against restrictive commercial practices in the buying and selling of technology; (4) Restructuring the current industrial property system, with the introduction of legislation common to the signatory countries of the Acuerdo de Cartagena.

Unpackaging technological elements and differentiation between ways of importing knowledge — In chapters I and II, an analysis was made of the importance of unpackaging knowledge and inputs within imported technology for: (a) the rationalization and better negotiation of these imports by breaking the ties that generate monopolistic profits; (b) the creation of demand for local activities that could be developed efficiently; and (c) the assimilation of imported technology and its complementarity with innovative efforts within the importing country. There are two types of unpackaging, which are interrelated in the technology process:

(a) Differentiation between, and separate evaluation of, the ways in which technology is imported and of the associated tied inputs. This differentiation includes intermediate inputs, imported capital goods, technical assistance and licenses, patents, agreements, or arrangements to market products, contracts to professionals, etc.

(b) The unpackaging of the technological input itself into its core components — as in knowledge about processing and basic engineering — and peripheral components, such as computing and detailed design engineering, technical assistance in plant layout and construction, civil and foundation engineering, electrical engineering, choice of equipment, etc.

The Subregion's technological development policy foresees a sustained joint effort to attain the gradual breakdown of imported technology. Previous studies by the Junta (see footnote 26) have shown that a minimal analysis of the components of a purchase (an analysis within the means of all the member countries) would bring significant benefits to the Subregion. As the necessary infrastructure is developed, it will be possible to unpack down to more complex levels.

The results of this incremental unpackaging process will be used for the following:

- To collect data on intermediate and capital goods in specific priority areas, thus improving the subregional position when buying in foreign markets.²⁸ Both national internal policies (such as those established by INCOMEX in Colombia) and subregional level policies (such as the possible joint use of the power of state purchase) would benefit directly from this type of information. The efforts of joint Andean industrial programming (such as those of the Industrial Development Sectorial Programs) will make it necessary, in certain instances, to purchase significant quantities of foreign inputs; these would be rationalized through the proposed unpackaging.
- Technological unpackaging that will create the basis for increasing and diversifying demand for services, goods, and knowledge that exist, or could be developed efficiently, in the Subregion.
- The results of the unpackaging will provide antecedents for the proper use of the international search for knowledge, as described in the following pages.
- Adequate industrial property policies at the sectoral level will become possible once the technological components, critical to the Subregion, have been identified.²⁹
- Finally, as technological and capital financing aspects are separated there is to be a better use of the policy instruments related to foreign investors in such instances as the negotiation of the terms of the participation of national or Andean capital in joint ventures in the Andean Group.

The International Search for Technology

The results of the unpackaging will be used directly in the search for alternative technologies and alternative sources in the world market.

Three different types of search are identified. Firstly, the users of technology — the Subregion as a whole, the countries, and the enterprises — need overall knowledge about the following if they are to plan and carry out industrial activities in the selected priority sectors: (a) relevant technology already on the world market and likely future developments; (b) the different sources of origin, be they manufacturing or consultancy firms, other similar industries, research institutes, etc.; and (c) the effects of each technology, even if they can only be estimated. (These “effects” include considerations of the required levels of competence and efficiency; the utilization of local factors of production and inputs; training; complexity; and degree and type of dependence on outside sources.)

Secondly, users need to stipulate specific conditions for the purchase of the technological inputs required for each individual project.

Thirdly, experts in the priority fields should take part in the search to help understand, appreciate, copy, and improve technologies already existing in the international market.

Each of these types of international search has particular characteristics that relate to (for example) the specific composition of the groups undertaking the search, their training, the duration of the project, etc.

The following instruments are proposed as a means of building up a system to fulfill the search functions:

²⁸ It has been estimated that approximately one-third of foreign trade in products manufactured in the USA is the result of sales between subsidiaries of the same parent. The prices in this trade reflect internal company policy rather than competitive market forces. Studies in the Subregion have shown considerable levels of overpricing of items imported in this way, as discussed in Chapter I.

²⁹ Each sector has a different importance for the Subregion and therefore requires different treatment and different policies (for example, the copper and cosmetics sectors in Chile). However, foreign knowledge covered by patents applicable in one sector could be of interest to, and have repercussions for, other sectors.

- The organization of special programs,³⁰ jointly financed by member countries and using local experts, to search for the first type in the selected areas, so as to develop local expertise in undertaking this type of research, and to assess the requirements and efficiency of these efforts.

- Promote the search for the second type within the planning mechanisms envisaged in the Acuerdo de Cartagena. The aim is to utilize the negotiating power conferred by either the joint acquisition of similar technological inputs that are needed by two or more countries, or, alternatively, in the purchase of different inputs supplied by the same source.

- Plan the establishment in other countries of offices or specialized groups to continuously supply the knowledge critical to the priority areas; and to monitor advances made in the rest of the world that are of particular interest to member countries.³¹

Evaluation and Selection of Imported Technology

The results of unpackaging and the search for knowledge, as well as the actual process of importing technology, make it necessary for the countries to have criteria and facilities for evaluating, selecting, and negotiating the best possible conditions for utilizing the technological factor most efficiently in terms of specific economic and social goals.³² The instruments that are proposed to use are:

- Joint and national efforts to develop the required capabilities of the national agencies established by Decision 24. The preparation is foreseen of operational criteria, a series of subregional meetings, exchanges of information with other countries that have experience in the field, and implementation of the regulations contained in Decision 24 to create adequate infrastructure in the Subregion.

- It is also proposed to directly incorporate technology research institutes in the Andean Group into the process of evaluation and selection of foreign technologies, the aim being to encourage complementarity between the generation and importation of technology.

- At a national level, programs of technical assistance and industrial extension services for small- and medium-size industries could be developed. This type of industry is the main source of direct employment in the Subregion.

(B) Stages in the Program of Importation of Technology

First Stage

This stage should demonstrate the importance and utility of both carrying out actions and taking initiatives related to importing technology, and also of studying the optimum use that could be made of policy instruments. The training of personnel and development of institutions should also be undertaken.

³⁰ The Junta has already experimented with a project in the iron and steel industry (see *Technology Policy and Economic Development: A Summary Report on Studies Undertaken by the Board of the Cartagena Agreement for the Andean Pact Integration Process*. Ottawa, International Development Research Centre, IDRC-061e, 1976. 108 p.).

³¹ In areas concerning such commodities as copper, tin, fisheries, coffee, etc., member countries need to be permanently up to date on those technological changes in the world that could seriously affect their economic interests.

³² Selection criteria refer, in the first place, to those parameters inherent in technology, such as yield (productivity and efficiency); versatility and flexibility (multiplicity of uses); complexity and training requirements; commercial life expectancy of the purchased technology; use of factors or inputs and the potential degree of adaptation to local conditions; and social impact. Additionally, there are evaluation criteria that refer to the conditions and manner in which technology is obtained. This is the case for direct costs (royalties), terms of other credit and collateral assistance (such as marketing inputs), delivery dates, guarantees, etc.

Special efforts should be undertaken at a national and subregional level, to get to know how the search, selection, and negotiation for foreign technology is approached by member countries, other countries with experience in this field,³³ and multinational enterprises.

This knowledge would be the direct result of projects related to each one of the instruments mentioned above; for example, in the unpackaging of imports and separation of the components of technology, or in the search for knowledge and in its evaluation and selection. These projects will be complemented with meetings of experts from competent national agencies in the Subregion, who would participate directly in the progress and results of these efforts. The meetings would help in both training and the exchange of information, as well as encouraging a more integrated approach in importing technology (thus minimizing the disadvantages of segmented and dispersed efforts).

Second Stage

This stage consists of the direct application of the policies and instruments analyzed above. In this period, policies would be developed for joint purchases — or options to purchase — inputs with common technological elements. It would be advisable to coordinate these policies with others in similar fields that might develop in the Subregion (for example, the Program of State Purchases).

The joint search, negotiation, and purchase of technological elements for programs of common interest will be undertaken in this stage; for instance, Sectorial Programs for Industrial Development (Programas Sectoriales de Desarrollo Industrial), agricultural and infrastructure programs, etc.

Also during this stage, the member countries should establish the necessary mechanism and strengthen the institutions that should give assistance, at a national level, to small- and medium-size industry, in the purchase of technology, as well as in industrial extension services. The policy for importing technology should be linked to the promotion of exports, either through negotiations with foreign enterprises or through Andean initiatives.

Third Stage

In this stage, imported technology should become a complement to national technological development efforts, sustaining local inventive efforts, rather than displacing them by consolidating the dependence we are trying to modify.

Finally, in this stage, policies should be established on technology imports that lead to the export of knowledge, either directly (as imported) or once adapted by local inventive processes. The economic conditions (availability and type of factors), commercial relations with other countries, as well as the political position of the Andean Group, could all produce some comparative advantages, and these must be taken up in the technological field.

On Assimilation of Technology

(A) Policy Instruments

As indicated above, foreign technology cannot be assimilated nor adapted if it is incorporated into the production process as a closed package, or as a collection of undifferentiated technological elements. The user must know the components well and be familiar with the technological principles involved. The following conditions, then, become indispensable for the efficient use of imported technology in the production system: that the technology should be previously unpackaged into its components; and that the user be properly prepared and have the necessary incentive to master the foreign technology he is importing.

³³ The Junta has carried out studies on the management of technology imports in Japan, Italy, and Yugoslavia.

The policy instruments proposed in this field are the following: specific programs for unpackaging technology and national purchases of elements of technology (see previous section on the importing and "import substitution" of technology); special training programs; and incentives to encourage scientific and technological activity by professionals, institutes, and Andean enterprises.

Special programs to equip enterprises, government organizations, research institutes, and individuals in activities complementary to importing technology — For a selective technology import policy directed to proper assimilation and adaptation of knowledge, four main sectors must exist and be active:

- (1) persons trained to carry out research, development, and design engineering associated with (located within) production units (state and private enterprises);
- (2) engineering consultancy and service firms capable of supplying specialized services efficiently at a subregional level;
- (3) national technological research institutes (eventually integrated into the subregional system), which could complement the scientific and technological activities of the users of technology;
- (4) competent national agencies to back up industry in its negotiations with technology suppliers that can help establish guidelines and the necessary minimum legal control over the process of assimilation and adaptation of knowledge.

The building up to such an infrastructure in the Subregion, coming about through experience and involvement in specific projects, requires support from two ad hoc instruments:

- (1) the design and execution of special programs to establish engineering, technological, and training departments within industry, as well as the creation of national (or Subregional) organizations skilled in locating and unpackaging foreign technology;
- (2) the design of programs to help train technology groups within the production sector and to guide research and development institutes in directions that increase the efficiency with which foreign technology is assimilated and adapted.

At a subregional level, it is proposed to initiate pilot projects intended to promote training of both staff and institutions in specified areas. However, the basic effort in capacity development should be at a national level and, in particular, at the level of industry that actually uses scientific and technological knowledge.

Incentives that promote scientific and technological activities in projects of economic and social interest to the Subregion — The Junta has carried out studies of various countries, and the results indicate that direct measures and policies have a more definitive effect on the technological development process, particularly in its early stages.³⁴ These measures include being selective when importing foreign technology; unpackaging technology and arranging complementary (or even parallel) activities locally; allocating resources and using local innovative efforts; treating local inventors favourably with regard to patents; and so on.

Indirect policies, such as financial and fiscal incentives, have proved to be relatively far less effective.³⁵

However, there are some specific indirect measures that could develop into efficient means of supporting certain technological activities. Among these measures the most significant are contributing risk capital and arranging credit facilities; these can enable professional or industrial groups to create or exploit local technological innovations.

³⁴ See *Technology Policy and Economic Development: A Summary Report on Studies Undertaken by the Board of the Cartagena Agreement for the Andean Pact Integration Process*. Ottawa, International Development Research Centre, IDRC-061e, 1976. 108 p.

³⁵ Among other reasons, the efficiency of these policies is weakened by the existence of similar incentives aimed at different goals; for instance, general economic development or the promotion of exports.

(B) Stages in the Assimilation of Technology Programs

First Stage

The setting up of a subregional policy for technological development that encompasses assimilation of foreign technology involves, in the first place, the establishment of training programs through specific projects; the definition of criteria; and the creation of capabilities not only among technology users, but also among those who plan, carry out, and finance economic and social development policy.

If they are to be incorporated into priority industries, projects directed at assimilation of foreign technology must demonstrate that such undertakings are highly profitable from both the economic and social perspectives.

The initial work would be based on three types of action:

- (1) negotiation with third governments and enterprises for the training of Andean personnel in plants and institutes abroad, thus providing opportunities for direct experience in learning the process of assimilation and the use of technology in the priority sectors;
- (2) the establishment, in the context of future investments in the Andean countries, of pilot projects to develop the capacity of institutions and industries in the methods of searching, unpackaging, evaluating, and assimilating technology;
- (3) the undertaking of Andean Programs of Technological Development (see below) specifically designed to assimilate technology from other countries.

Second Stage

The second stage requires far more active participation from national enterprises and institutions, and leads on from both the first stage and from the direct effects of the decision to unpackage technology before importing it.

The main participants would be the users of technology and relevant government agencies, who, through an enhanced understanding of the role of technological factors in industry, would acquire the ability to assimilate core technology and to manage and develop their own peripheral technology. At this stage, the institutions or enterprises entrusted with major projects should already have their own planning and technological development departments, as well as engineering and construction services, all with sufficient expertise to understand and manage the imported core technology. Also, facilities for credit and risk capital should be set up, together with the other incentives that will help the user to exploit effectively the subregional capacity, to develop peripheral technology around assimilated core technology. The acquisition of capabilities in these areas will allow the user to enter into other activities, such as the adaptation of imported technology.

On the Creation and Adaptation of Scientific and Technological Knowledge

The process of generating technology to serve the social and economic objectives of a country should begin with the identification and definition of needs. It should then continue by searching for, or generating, means to satisfy the needs. The culmination is the introduction of the solution to the production system.

Any interruption to this cycle disturbs the whole process and prevents the country from gathering the full benefits of the resources and possibilities it (or the rest of the world) possesses. In most of the Andean cases, the main participants in the sequence are quite independent of each other.

(A) Policy Instruments

The instruments proposed are as follows: planning the generation of technology; Andean Projects for Technological Development; other forms of cooperation.

Planning the generation of technology — This consists of identifying the areas and concrete problems that require scientific and technological inputs to their solution — solutions that, in turn, will facilitate the execution of plans and the realization of economic and social objectives. This orientation does not negate pure science; training and research in pure science are covered by scientific and educational policy in member countries. The proposed orientation involves a significant reallocation of resources and, secondly, direct participation of those institutions that determine economic and social policies in relation to technological development plans. There are two specific instruments that could be used to plan the generation of technology:

(1) As a result of unpackaging technology into its components (as discussed previously), and with the knowledge of national and subregional capabilities (which would be provided by an information system), requirements for technological development will be defined progressively and at a less aggregate level. With these antecedents, as a function of the selected priorities, the formation, or improvement, of different specific capabilities can be planned. This experience would produce concrete guidelines and information for extending this practice to a more aggregate level.

(2) With reference to the knowledge-generating sector, the general practice of channeling state support toward centres and institutions through goal-oriented contracts would lead to planning of their activities in accordance with real economic and social requirements.

This involves a change in current methods of funding scientific and technological activities from nonoriented budget allocations to “contracts for services.” Funds allocated to an organization would clearly specify the objective of the research or service, its estimated duration, expected results and possible applications, possible users of results, benefits to users, etc.

Andean Projects for Technological Development (Proyectos Andinos de Desarrollo Tecnológico — PADT) — PADT are multinational projects contracted out to copy, adapt, or create technology through a joint effort of the countries of the Subregion. The major characteristics of the PADT, are:

(1) The priority areas and activities for the PADT are set by institutions in charge of planning and execution of economic and social development policies for member countries.

(2) Project preparation and approval are the concern of the main bodies of the Acuerdo de Cartagena (i.e., the Junta and the Commission).

(3) When projects are formulated they must include a detailed definition of the problem, objectives, methodology, evaluation criteria, human and material requirements, time scale, and possible economic and social benefits. These conditions form the basis for control and evaluation of the project.

(4) To help coordination at the subregional level, and to encourage adequate progress in meeting objectives, each project must have a “contracting committee.” This would comprise representatives of institutions, or enterprises, from those member countries that face the technological problems in question, together with one representative of the Junta. This committee would have the following functions: (a) to identify, select, and sign contracts with the institutions where the project will be developed; (b) to monitor the progress of the project; (c) to establish administrative procedures, including the appointment of country representatives; (d) to administer the project’s budget; and (e) to define other functions required for the execution of the project and for the subsequent application of the results. The committee would meet periodically, according to the size and needs of the project.

(5) The productive knowledge developed by each PADT will belong to those governments that participate in the corresponding project; they could decide the most suitable areas and form of application for the knowledge within the territory of each country.

When a third party, such as a government or a national of a nonparticipating member country, or a government or person from outside the Subregion wishes to use results obtained from a PADT, they should apply to the Junta, who will decide on the conditions under which it may be used. As long as a special subregional institution does not exist, any funds generated in

these transactions will be deposited in a special account and will be used to prepare and carry out further PADTs.

Other forms of scientific and technological cooperation — Besides the PADTs, multinational technological activities could give rise to other forms of cooperation.

(B) Stages in the Generation of Technology Programs

First Stage

The first important task in the generation of technology programs is to show decision-makers and planners, as well as those who implement policies, that investment in the generation of scientific and technological knowledge in accordance with economic and social needs is an activity that has significant results even within a relatively short term. If care is taken in choosing priority areas, and objectives are identified using clearly specified instruments and controls, technology can be generated efficiently and within relatively short periods of time. The proposals for technological development in nonferrous metals and in tropical forestry (prepared by the Junta) are a step toward fulfilling the above-mentioned objectives.

Another task at this stage would be to establish an institutional technological infrastructure and to train personnel through participation in specific projects that lead to economic and social benefits. These projects, like the PADTs or those linked with unpackaging, locating, and assimilating knowledge, would create the links for technological development between government, production, and innovative sectors.

At this stage, it is not considered convenient to create a fund for technology to be allocated a priori by the government, since an adequate technological infrastructure does not yet exist to permit proper use of the funds.³⁶ Nor is the establishment of an institution to administer the process at a subregional level recommended. On the contrary, the activities will be financed with funds specially allocated for specific projects or groups of projects. The sources of finance could be from the governments of the member countries or from subregional or selected foreign institutions.

Second Stage

Three or four years after the approval of a subregional policy for technological development, the Andean countries should be in a position to define the institutional system that, at a subregional level, will plan and administer the adaptation and generation of scientific and technological knowledge. The system might be designed also to negotiate and manage the income from the sale of collectively generated knowledge to other countries outside the Subregion. It could also be responsible for promoting and applying this knowledge in the Subregion itself as well as encouraging its sale to other countries.

During this second phase, the member countries should examine the possibility of establishing special funds and allocations by countries to be used in generating scientific and technological knowledge in the Subregion. These measures would be coordinated with those described above (in the second stage of "Stages in the Assimilation of Technology Program"). By this time, the Subregion would have had enough antecedents both with other countries and international financial institutions, to judge the most appropriate and convenient form of subregional negotiation for possible funds to finance the generation of technology, complementing the activities that the Andean Development Corporation (Corporación Andina de Fomento) could undertake in the same field.

On the Information System

Each one of the instruments described under importation, assimilation, and generation of technology creates its own specific information needs with distinct and varying characteristics

³⁶ Experience in the Subregion has shown that without an appropriate infrastructure, past allocations of substantial government resources were frequently misused or not used at all, with the resulting loss of opportunity.

according to the sources of information, their degree of precision and availability, conditions of acquisition, management, and diffusion.³⁷ Moreover, the need for information will grow qualitatively and structurally with economic and social development and the expansion of technological activities. Since the tasks to be undertaken in developing an adequate subregional technological infrastructure are complex and will evolve progressively, the information system must also advance step by step to complete various initial stages in both technological programming and the information system itself.

Apart from the principles outlined for information in Chapter II, a prerequisite for the success of the system is to overcome the present segmentation of information within the Subregion. This segmentation has its origins in the false assumption that it is an efficient policy to keep all sorts of information secret, thus restricting the activities of neighbouring countries. In practice, this accentuates the relative ignorance of each and every one of the countries; the only parties to benefit are the suppliers of foreign technology, who can exploit this ignorance to generate monopolistic advantages.³⁸

(A) Information System Instruments

These are (a) information subsystems; (b) coordination mechanisms; (c) technical assistance and consultancy.

(a) *Information subsystems* — These are the elements and procedures used to find, obtain, process, disseminate, and deliver information. Seven subsystems have been defined according to their objectives and content. Their main characteristics, content, and modes of creation are described below.

(b) *Coordination mechanisms* — Classification of subsystems does not imply segmentation in the use of information. Each function or substantive decision will in all probability need to use information from several subsystems. There is also a need for coordination among and between national and subregional institutions. Thus, mechanisms are needed to coordinate subsystems so that they can be used together, according to the requirements of any given substantive function.

(c) *Technical assistance and consultancy* — Technical assistance and consultancy between institutions are extensions of the information process, in which information is not handed over through a neutral mechanism but is accompanied by a judgment or evaluation.

Information Subsystems

The information that should be managed through a subregional system can be classified into two categories. In the first is the information that, because of its homogeneity and ease of definition, can be managed through fairly structured and standardized procedures. These may lead to regular flows of information. In this category is most of the information required by the first three subsystems defined later in this section. The Junta has already carried out extensive studies and pilot projects whose conclusions can generate concrete recommendations for implementing specific activities in these areas of the information system. Secondly, there is information that is dispersed among different persons, groups, institutions, and enterprises inside and outside the Subregion. This type of information (mostly in subsystems 4 to 6, see below) cannot be managed through a rigid system, and so requires different treatment. Here, emphasis should not be on the organization of flows or on static registers of information, but on ways of identifying and obtaining access to information and on exchanges between centres and specialists through a continually developing network of contacts. It also encompasses

³⁷ See Appendix I for a summary of the policy instruments in each of these activity areas; some of their information needs are included there, together with possible steps to satisfy them.

³⁸ See Junta del Acuerdo de Cartagena, *Policies on Technology of the Andean Pact: Their Foundations*, document presented at the meeting of UNCTAD III.

preparation and distribution of abstracts of the information available on specific topics when there is a defined need for such an action. For these reasons it is proposed that pilot projects be initiated on specific subjects and problems (so as to encourage the development and use of the network) as distinct from the development of procedures for circulating highly standardized information.³⁹

The characteristics of these two types of information are reflected, therefore, in the type of task proposed for each category in the development of an information system within the subregional policy for technological development. However, it should be emphasized that the distinction between the categories, although useful as a general orientation, should not be too rigid. In the more structured subsystems, there is always the complementary possibility of obtaining information through contacts outside the regular sources. On the other hand, subsystems that function through contact networks, may have minimal regular flows of bibliographic and documental information.

Subsystem 1

The first information subsystem refers to foreign investment and licensing contracts. The sources and users of this subsystem would basically be the "National Competent Offices" established by Decision 24 to ensure the compatibility of efforts and the collection (at a national level) of data, together with its processing at a subregional level and its subsequent diffusion. The object of this subsystem would be to collect, analyze, and use information on the ways and modes in which foreign technology and foreign investments enter member countries. This includes several aspects of both: their origins and structures, their effects on various aspects of the economies of member countries, and their compatibility with national development plans and integration objectives. Apart from these specific information inputs, this subsystem would have as its objective the creation of institutional capabilities, together with the application of coherent, efficient measures with regard to foreign investment and imports of technology.

Subsystem 2

The second subsystem deals with the issue of transfer pricing exercised by transnational enterprises, the prices quoted in different markets internationally, and the prices of goods and services exported and imported by the member countries in connection with the flow of foreign investments and technology to the Andean Pact. With subregional initiative and the existing national efforts, the search, acquisition, and distribution of data from outside the Subregion will become organized. The data will be analyzed so as to permit comparison with prices of products already available in the Subregion.

Subsystem 3

This subsystem covers information on industrial property to be coordinated with the specialized subregional office.

Subsystem 4

The fourth subsystem is for information about the technological infrastructure of member countries. What are needed at a national level are inventories, references, or other forms of data

³⁹ We can illustrate the comparison between subsystems that are well structured and those that are progressively growing contact networks, with initially an example of the first type: the collection and dissemination of information on registration of foreign investments in national institutions. As an example of the second type, we can mention the needs and efforts of a technical institution that working through references and contracts with sources of information, responds to enquiries on subjects ranging from sources of technology, state of the art reports, patents, documentation, publications on a given subject, etc., to even such detailed enquiries as the value of physical, chemical, and technical constants (i.e., isolated and precise data). In the first instance, homogeneous information is regularly collected and analyzed; in the second, the dominant characteristic is the capacity to react efficiently to an enquiry. For the latter, it is necessary to know where to find the information and to have access to it (reference and referral techniques).

on the existence and capacity of institutions, with mention of services they can offer and to specific capabilities in consultancy, applied research, building of prototypes and equipment, etc.

Again, at a subregional level, reference procedures should be established to make nationally generated data available. This means more than simply a centralized information depository.

Subsystem 5

Next comes the subsystem for acquisition and management of information about technology, including sources and alternatives. The base of this subsystem would be at a national level, with subregional coordination for specifically designed projects.

Subsystem 6

In the sixth place is the subsystem for transmitting technical/scientific information contained in the professional literature for specialists in priority areas. This applies principally to research and development and other scientific and technical activities. In this case, the responsibility for the system will be at a national level.

The structure of subsystems 5 and 6 is characterized by two aspects: by the establishment of a network and by access of information that are progressively built up in response to specific demands for information. However, this does not exclude the possibility that, in chosen areas of interest to the member countries, specialized services may be developed at a national level covering, for instance, sources of bibliographies or documents, journal subscriptions or reference lists, or any other type that might be necessary.

(B) Stages in the Establishment of the Subregional Technological Information System

First Stage

The objectives and activities in the first stage would be as follows:

- Agreement on institutions and establishment of the minimum procedures necessary at both the national and subregional levels for setting in motion the development and coordination of the information system. This will be achieved gradually, and in relation to the subregional program for technology policy;
- Establishment of subsystems for foreign investment and technology imports, prices of raw materials and intermediate goods, and industrial property (subsystems 1 to 3). Because they are interrelated, all three systems should be created simultaneously;
- Pilot studies of needs (demand), content, purpose, and main operational criteria for subsystems 4, 5, and 6 described previously.

The emphasis throughout all these activities is on the development of skills and the establishment of institutional nuclei to participate from the outset in generating an information system. This information system cannot be established through legislation but needs concrete activities, examples, and practice, together with mutual exchange of experiences. This process of formation is much more than the initial accumulation of data. With the training objective in mind, meetings should be organized between representatives of competent and coordinating agencies with technical staff of the Junta; this will aid the diffusion of knowledge of the program and stimulate discussion on how best to achieve the various objectives.

Second Stage

In this stage, the information system will be consolidated in all its aspects and its activities coordinated at a national and subregional level. If this is to be achieved, the six subsystems must be updated to enable both the development and further augmentation of the system. The same may be said of the whole structure, including the national and subregional procedures and, in particular, of the institutions appointed by Decisions of the Commission of the Acuerdo de Cartagena. When it is integrated, special attention must be paid to two aspects of the

permanent system. First, and particularly in the cases where references, access to information, etc., are concerned, the user (private or institutional) must be given the maximum opportunity to benefit through the system. This implies diffusion of information about the system and information about information.

Secondly, the subregional and national infrastructure should have permanent mechanisms for evaluating needs and discovering whether or not they are being met. They must also have the means of broadening and modifying the system as required. This responsibility would be split between the subregional institution and national coordinating agencies.

The following activities should be accomplished in this stage:

- Establish the minimum essential national information procedures about needs, technological conditions, and infrastructure; establish exchange networks; and consolidate this information.

- At the national level, systematically study the specific requirements for information on alternative sources and technologies relating to the chosen sectors, and develop systems accordingly. A possibility is the formulation and application of back-up measures for those national centres that do not directly participate in specific projects of the subregional program.

- Determine the viability and procedural structure for capturing technological information (sources and alternatives) by Andean groups or offices established in industrialized countries.

- Promote the development of technical assistance and industrial extension services at a national level.

- Update the structure, broaden the applications, and update the information in the system about foreign investments, technology licenses, prices, and industrial property.

Appendix I

Technology Policy Instruments and Information Needs

Information needs				
Instruments	Type of information ^a	Management	Use	Responsibility, coordination, and control
<i>For imports</i> Identification of different ways of importing technology	Capital investment, patents, machinery and equipment, plant construction and execution of projects, and other inputs linked with technology	1) At the level of economic activity and industrial sector 2) Competent National Office set up by Decision 24 (ONC) ^b 3) Relevant Subregional Agency set up by Decision 24 (JUNAC)	1) Rationalization of purchase and assimilation 2) National and subregional purchases 3) Subregional purchasing power in other countries	1) User and ONC 2) ONC 3) Relevant subregional agency and user
33 Unpackaging technology into its components	Core technologies Peripheral technologies Availability of technology and conditions for acquiring it	1) At the level of economic activity, by the user 2) ONC with participation of research institutes 3) A subregional agency that could be set up for the purpose of implementing technology policy	As for previous instrument	As for previous instrument
International search — for the first type	Alternative technologies available Their sources Assessment of their global effects	At three levels (individual user, ONC, and subregional level)	To better understand the international technology market	At the three levels
— for the second type	Conditions of purchase and prices	On the three levels, but linked to users through specific projects	To improve negotiating position	User or group of users
— for the third type	Specific scientific and technological knowledge	User	To study, copy, and use foreign scientific and technological knowledge	User

Decision 24, evaluation and selection

Generation of income
Effects on balance of payments
Creation of employment
Utilization of internal resources
Technological effects
Technological alternatives
Others

- 1) At the level of the user
- 2) At the level of the ONC, which would authorize foreign investments and licensing contracts, and implement sectoral technology policies
- 3) At the level of the Junta del Acuerdo de Cartagena

- a) To identify the strategies of foreign companies having subsidiaries in one or more country(ies)
- b) To contribute to the implementation of sectoral policies for technology import and development at a national and subregional level
- c) To assess subregional technology imports and foreign investments as a whole

- 1) User
- 2) ONC
- 3) JUNAC

For assimilation
Unpackaging and national buying

Information about the technology infrastructure including consultancy firms, works, research institutes, engineering departments, etc.
Future projects and their technological requirements

- 1) The basic information structure is established at ONC level
- 2) At a subregional level there is only information (where to find information at a national level)

To encourage and manage demand for scientific and technological activities and the subregional infrastructure

At a national level, with some coordination at a subregional level

Training

As for the previous instrument
Information about potential training centres in other countries
Technological requirements of small- and medium-size industries

- 1) The technology itself, at the level of the user
- 2) ONC for industrial extension and other services to small- and medium-size industries
- 3) In training for technology policy implementation, the storing of information at the three levels (user, ONC, and subregional)

- To:
- a) Establish within industry departments of engineering and technological development
 - b) Provide services to small-scale industry with restricted technological capacity
 - c) Jointly negotiate for Andean professionals to be trained in factories, institutes, etc. in other countries
 - d) Train people to carry out and implement subregional programs

- 1) User
- 2) Specialized national offices
- 3) At the three levels

Incentives	Effects of monetary, fiscal, foreign exchange, etc. policies on technological development	1) ONC 2) Subregional	To establish criteria and policies	1) National governments 2) Departments of the Acuerdo de Cartagena
<i>For generation</i> Programing	Unpackaging Future projects in the economic sector Rate of technology imports	At a project level, and increasingly more aggregated national levels	To establish coefficients of technological needs that arise from economic and social development	National planning offices and ONCs
Andean Projects for Technological Development (PADT)	Scientific and technical information Information on the use, and economic and social effects, of PADT technologies Resources required for PADT	At the subregional level, the institution controlling the PADT; at the level of the participating countries	For PADT to efficiently attain their objectives	1) The subregional institution directing each PADT 2) The national agencies participating
Scientific and technological activities in general (defined in Chapter II)	Scientific and technological information Future economic projects Information on the use, and economic and social effects, of scientific and technological activity	Specialized institutions and users of information	To carry out and evaluate scientific and technological activities	1) National agencies participating in scientific and technological activities 2) National agencies specialized in technical information

^a This refers not only to information acquired through the instrument but also to information that might be generated, and that should be communicated to the technological system.

^b In this table, other national institutions that carry out specific work related to technology are included, apart from the ONC established by Decision 24:

Appendix II

Selected articles from Decision No. 24* of the Cartagena Agreement Commission¹

(* Decision 24 was adopted during the third period of Extraordinary Meetings of the Cartagena Commission, December 1970.)

Common Treatment for Foreign Capital and Trademarks, Patents, Licensing Agreements and Royalties (Selected Articles)²

Chapter I

Article 1.—To the purposes of the present regime the following definitions shall apply:

Direct Foreign Investment.—Contributions coming from abroad, owned by foreign individuals or concerns, to the capital of an enterprise must be in freely convertible currencies, industrial plants, machinery or equipment with the right to re-export their value and to remit profits abroad.

Also considered as direct investments, are those investments in local currency originating from resources which have the right to be remitted abroad.

Foreign Investor.—The owner of a direct foreign investment.

National Investor.—The State, national citizens, national non-profit companies and national enterprises as defined in this article. Foreign citizens who have resided in the receiving country uninterruptedly for one year, who have formally waived the right to re-export capital and remit profits abroad before the pertinent national agency, are also considered as national investors.

National Enterprise.—That established in the receiving country and in which over 80 per cent of its capital belongs to national investors, provided that, in the opinion of the pertinent national agency, this proportion is reflected in the technical, financial, managerial and business direction of the enterprise.

Joint Ventures.—That established in the receiving country and whose capital belongs to national investors at a percentage ranging from 51 to 80 per cent, provided that, in the opinion of the pertinent national agency, this proportion is reflected in the technical, financial, managerial and business direction of the enterprise.

Foreign Enterprise.—That in which national investors' capital is under 51 per cent or, if higher, when in the opinion of the pertinent national agency, that percentage is not reflected in the technical, financial, managerial and business direction of the enterprise.

New Investment.—Any investment made after 1 January 1971, in new or existing enterprises.

Reinvestment.—Investment of part or all non-distributed profits originating from a foreign direct investment in the same enterprise that generated them.

Receiving Country.—That in which the direct foreign investment takes place.

Commission.—Cartagena Agreement Commission.

Board.—Cartagena Agreement's Board.

Member Country.—Any of the Member Countries of the Cartagena Agreement.

Article 2.—Any foreign investor desiring to invest in one of the Member Countries shall submit an application to the pertinent national agency which, after evaluation, shall authorize it, provided it meets the development priorities of the receiving country. The application shall be in keeping with the pattern set up in Appendix No. 1 of the regime.

The Commission, on proposal from the Board, may approve common standards for evaluating direct foreign investment in the Member Countries.

Article 5.—Any foreign direct investment shall be registered at the pertinent national agency together with the agreement which determines the terms of the authorization. The amount of the investment shall be registered in freely convertible currency.

¹ Quoted without change from the original document.

² From Minutes of the Third and Fourth Period of the Extraordinary Meetings of the Commission of the Andean Pact, Lima, December 1970.

Article 6.—The control of the fulfillment in compliance contracted by foreign investors will be undertaken by the agency recording the investment, together with the pertinent state agencies or bureaus, as may be the case.

In addition to the functions established by other provisions in the present regime and those to be established in the corresponding regulations, the pertinent national agency shall:

- (a) Supervise compliance to the commitments for national participation in the enterprise's capital, technical, managerial, financial and business direction;
- (b) Authorize, in special cases, the purchase of stock, shares or rights of national enterprises or joint ventures by foreign investors as stipulated in Article 3 and 4 of the present regime;
- (c) Establish an information and control system of the prices of intermediate products supplied by foreign technology or capital suppliers;
- (d) Authorize to transfer abroad, in freely convertible foreign currency any sum which the enterprise or the investors have a right to remit as per the present regime and the legislation of each country;
- (e) Centralize the statistical accounting information and control registers in regard to foreign direct investment; and
- (f) Authorize licensing agreements for the use of imported technology and the exploitation of trademarks and patents.

Article 18.—Any contract regarding importation of technology or regarding use of patents and trademarks shall be reviewed and submitted to the approval of the pertinent agency of the respective Member Country, which shall evaluate the effective contribution of the imported technology by means of an appraisal of its possible profits, the price of the goods embodying technology or other specific means of measuring the effect of the imported technology.

Article 19.—Contracts for importing technology must, at least, contain some clauses regarding the following:

- (a) Identification of the nature assumed by the transference of the technology to be imported;
- (b) Contractual value of each of the elements involved in a similar way as that used in the registration of foreign direct investment; and
- (c) Determination of the time during which the contract shall be in force.

Article 20.—The Member Countries shall not authorize contracts for the transference of foreign technology or use of patents containing:

- (a) Clauses stipulating that the furnishing of technology carries with it an obligation on the part of the receiving country or enterprise to purchase capital goods, intermediate products, raw materials or other technologies from some given source, or to make permanent use of staff appointed by the firm supplying the technology. In exceptional cases the receiving country may accept clauses of this nature for the purchase of capital goods, intermediate products or raw materials provided their price falls within the levels prevailing in the international market;
- (b) Clauses stipulating that the technology furnishing firm reserves the right of establishing the sale or resale prices of the products manufactured on the basis of the respective technology;
- (c) Clauses stipulating restrictions as to the volume and structure of production;
- (d) Clauses prohibiting the use of competitive technologies;
- (e) Clauses stipulating a total or partial purchase option in favor of the furnisher of technology;
- (f) Clauses committing the buyer of technology to transfer to the furnisher those inventions or improvements obtained through the use of said technology;
- (g) Clauses stipulating payment of royalties for unused patents to the holders of said patents; and
- (h) Other clauses having equivalent effects.

With the exception of special cases, duly verified by the pertinent agency of the receiving country, clauses prohibiting or limiting in any way the export of the products manufactured on the basis of the respective technology, will not be accepted.

In no case clauses of this type will be accepted regarding subregional trade or the exporting of similar products to third countries.

Article 21.—Intangible technological contributions will have the right to payment of royalties, with the prior authorization of the pertinent national agency, but may not be registered as capital contributions.

When these contributions are made to a foreign enterprise by its parent company or some other affiliate of the same enterprise, payment of royalties shall not be authorized nor will any deduction be accepted for this reason for tax purposes.

Article 22.—National authorities shall undertake a continuous and systematic identification of the technologies available in the world market for the different fields, for the purpose of having at their disposal the most favorable and convenient alternative solutions for the economic conditions of the subregion and shall submit the result of their task to the Board. This action shall be implemented in co-ordination with those adopted in Chapter V of this regime regarding the development of national or subregional technology.

Article 23.—Upon proposal by the Board, and before 30 November 1972, the Commission shall approve a program directed to promoting and protecting the development of subregional technology as well as the adaptation and implementation of existing technologies.

Among other matters, this program shall contain:

- (a) Special benefits, tax or otherwise, to encourage the development of technology and specially those related to the intensive use of subregional inputs which are designed to make an efficient use of subregional productive factors;
- (b) Encouragement of exports of products manufactured on the bases of subregional technology to third countries; and
- (c) Channeling of domestic savings to the establishment of subregional or national research and development centers.

Article 24.—The Governments of the Member Countries in their purchases shall give preference to products incorporating subregional technologies in the way which the Commission deems convenient. The Commission, upon proposal by the Board, may propose to the Member Countries to levy taxes on those products using foreign trademarks which involve payment of royalties when easily available or known technology is used in their manufacture.

Article 25.—Licensing agreements for the exploitation of foreign trademarks in the area of the Member Countries cannot contain restrictive clauses such as:

- (a) Prohibition or limitations to export or sell products manufactured under the respective trademarks or similar products in some given countries;
- (b) The obligation to use raw materials, intermediate goods or equipment supplied by the trademark holder or its affiliates. In exceptional cases, the receiving countries may accept clauses of this type, provided their price is within the levels currently prevailing in the international market;
- (c) Fixing the sale or resale prices of the products manufactured under the trademark;
- (d) The obligation to pay the trademark holder royalties for unused trademarks;
- (e) The obligation to provide permanent employment to personnel provided or appointed by the trademark holder; and
- (f) Other clauses having equivalent effect.

Article 26.—The Commission, upon proposal by the Board, may identify production processes, products or groups of products for which no patent privileges may be granted in any of the Member Countries. Furthermore, it may decide on the treatment of privileges already granted.

Article 48.—Member Countries bind themselves to keep each other informed and inform the Board regarding the application of the present regime in their territories, and specially as regards the norms contained in Chapter II. Furthermore, they bind themselves to establish a permanent system to exchange information on the authorizations for foreign investment or importation of technology granted in their territories for purposes of facilitating an increasing harmonization of their policies, and of improving their negotiating capacity to obtain terms no less favorable, for the receiving country, than those which have been negotiated in similar cases with any other Member Country.

Furthermore, they bind themselves to closely co-ordinate their action in international agencies and forums which consider matters related to foreign investments or transfers of technology.

Article 50.—Member Countries will not grant foreign investors a more favorable treatment than the one granted to national investors.

Article 51.—In no instrument concerning investment or technology transferences, clauses preventing the possible conflicts or controversies of the national jurisdiction and competence of the receiving country or permitting the subrogation by the States of the rights and actions of their national investors, will be admitted.

Discrepancies arising among the Member Countries of the present regime regarding its interpretation or implementation will be solved in keeping with the procedures established in Chapter II, section D, "Controversies solution," as set forth in the Cartagena Agreement.

Chapter V

Article 52.—In keeping with the provisions of the present regime and Chapter II of the Cartagena Agreement, the Board and the Commission will have the following powers:

The Commission

- (a) To decide on the proposal which the Board submits for its consideration regarding the treatment of foreign capital, industrial property and the technology development and importing system, in compliance to the present regime;
- (b) To approve, upon proposal by the Board, the regulations which may be necessary for the better application of the common regime; and

- (c) To adopt all other measures tending to facilitate the achievement of its objectives.

The Board

- (a) To watch over the implementation and compliance of the regime and the regulation which might be approved by the Commission in this regard;
- (b) To centralize statistical, accounting or any other type of information in relation to foreign investment or transfer of technology provided by the Member Countries;
- (c) To collect economic and legal information on foreign investment and transfer of technology and provide it to the Member Countries; and
- (d) To provide to the Commission the measures and the provisions which may be necessary for a better application of the present regime.

Article 54.—The Member Countries will establish a Subregional Industrial Property Bureau which shall have the following functions:

- (a) To serve as a liaison agency among the national industrial property bureaus;
- (b) To collect and circulate information regarding industrial property among the national bureaus;
- (c) To prepare model licensing contracts for the use of trademarks or exploitation of patents in the Subregion;
- (d) To advise national bureaus on all matters regarding the application of the common rules on industrial property which may be adopted, and the regulations referred to by transitory article G;
- (e) To implement studies and submit recommendations to the Member Countries regarding invention patents.

Article 55.—The Commission, upon proposal by the Board, shall establish a subregional system for the promotion, development and adaptation of technology which shall, besides, be entrusted with the function of centralizing the information referred to in Article 22 of the present regime, and circulate it among the Member Countries, together with what it may obtain directly regarding the subject and the conditions for importing technology.

Transitory Provisions

Article B.—Foreign investments existing in the territories of the Member Countries on the date when the present regime comes into force, will be registered with the pertinent national agency within the following six months.

These investments will continue enjoying the benefits granted to them by the provisions in force in everything which is not opposed to the present regime.

Article C.—Until the provisions provided for in transitory Article G of the present regime come into force, Member Countries will abstain from entering unilaterally into agreements with third countries regarding industrial property.

Article D.—Within the three months following the coming into force of the present regime, each Member Country shall appoint the agency or agencies competent to authorize, register and control private investment and the transfer of technology and will inform the other Member Countries and the Board regarding this appointment.

Article E.—All contracts regarding the importations of technology and licensing for the exploitation of foreign trademarks and patents entered into until the date the present regime comes into force will be registered with the pertinent national agency within six months following said date.

Article F.—Within six months following the coming into force of the present regime, the Commission, upon proposal by the Board, shall approve the provisions for the Subregional Industrial Property Bureau.

Article G.—Within six months following the coming into force of the present regime, the Commission, upon proposal by the Board, will adopt provisions for the application of the rules regarding industrial property which shall include, among others, the subject listed in Appendix No. 2.

Appendix No. 1 **Guide for Authorization, Registration and Control** **of Foreign Investment**

Every foreign investment application shall include:

I. Identification of the investor:

- (a) Name.
- (b) Nationality.
- (c) Members of the Board of Directors.

- (d) Roll of management and staff.
 - (e) Economic activity.
 - (f) Copy of the deed of Incorporation.
- II. Characteristics of the Investment:
- (a) Financial resources in foreign exchange or credits
 - Currency in which the investment is made.
 - National capital.
 - Foreign capital.
 - Credit from parent company.
 - Credit from other sources.
 - Overall interest to be paid for the credits.
 - (b) Physical or tangible resources such as:
 - Industrial plants.
 - New or reconditioned machinery.
 - New or reconditioned equipment.
 - Spare parts.
 - Parts and components.
 - Raw materials.
 - Semi-manufactured products.
 - (c) Resources derived from technology or intangible such as:
 - Trademarks.
 - Industrial models.
 - Managerial knowledge.
 - Possible alternative technologies.
- Technical knowledge may take the following forms:
- (i) Objects:
 - Samples.
 - Unregistered models.
 - Machinery, instruments, parts, tools.
 - Manufacturing appliances.
 - (ii) Technical documents:
 - Formulas, calculations.
 - Plans, drawings.
 - Unpatented inventions.
 - (iii) Instructions:
 - Notes on the preparation, manufacture, operation of the product or the process.
 - Explanations or practical advice for manufacturing (know-how).
 - Technical pamphlets.
 - Complementary explanations of patents.
 - Manufacture flow-charts.
 - Control methods.
 - Sums to be paid as royalties.
 - Identity of the party receiving the royalties.
- III. Requirements to be met:
- (a) Scarcity of domestic savings.
 - (b) Scarcity of foreign exchange.
 - (c) Lack of managerial or administrative capacity.
 - (d) Need to have access to scarce technological know-how.
 - (e) Lack of capacity or of commercial contacts for the sale of goods in the international markets.
 - (f) Lack of local enterprising spirit.
- IV. Schedule for progressive domestic participation:
- (a) Percentage of stock shares to be placed in the hands of national investors.
 - (b) Terms and conditions to carry this out.
 - (c) Ways of determining the value of the investment.
- V. Consequences of the new investment:
- (a) Approximate date to start normal operations.
 - (b) Operational capacity.
 - (c) Exportable production.
 - (d) Generation of additional employment.
 - (e) Importation of raw materials or intermediate products on a yearly production.
 - (f) Use of domestic inputs.

Appendix No. 2

Provisions that the Regulations Must Contain in Order to Apply Norms for Industrial Property

- (a) Determination of the signs, words, symbols or names which can be registered as trademarks.
- (b) Provisions regarding ownership of trademarks, procedures to obtain it, parties which may hold the right, etc.
- (c) Uniform product classification regarding the trademarks.
- (d) Terms and publication for opposing registration.
- (e) Priority or right to opposition.
- (f) Use of the privileges.
- (g) Lapsing for lack of use.
- (h) End of the privilege.
- (i) Negotiation of the trademark.
- (j) Uniform causes for annulment, non-renewal, cancellation due to prior registrations, etc.
- (k) Classification of patents.
- (l) Determination of the products and industrial processes which may be patented in function to the objectives of the overall strategy development of the subregion.
- (m) Patentability conditions, and particularly, uniform criteria to establish the newness and the industrial application of the patent.
- (n) Patent holders.
- (o) Procedure for registration, opposition, manner of applying the invention, etc.
- (p) End of the privilege; and
- (q) Rules regarding industrial models and drawings.

Appendix III

Decision No. 84* of the Cartagena Agreement Commission¹

(* Decision 84 was adopted during the 13th period of Extraordinary Meetings of the Cartagena Agreement Commission, May–June 1974.)

Bases for a Subregional Technology Policy²

The Cartagena Agreement Commission

In accordance with the Declaration of Bogota, articles 25, 27, 38, 70, and 106 of the Cartagena Agreement, and Decisions 24, 46, and 49 of the Commission of the Agreement;

CONSIDERING that in the present world the possession of special skills and the ability to use them have a decisive influence on the direction given to economic and social development and the scope for autonomous action by nations within the international community;

That the object of the Cartagena Agreement is to promote the economic and social development of its Member Countries in order steadily to improve the standard of living of the inhabitants of the Subregion;

That economic and social development thus understood means transformation of the social structure to make it more equitable and so to foster qualitative change in the living conditions of the inhabitants of the Subregion, in their institutions and in their productive units;

That the economic policy of the Member Countries has not explicitly incorporated technology as a decisive factor in economic and social development;

That in the past one of the means used to promote development in the Subregion was an inadequate system of protection that has resulted in serious inefficiencies and given artificial encouragement to the participation and use of foreign firms and foreign production factors;

That a situation of marked technological dependence has been produced by a combination of obstacles to development;

That the scientific and technological work in the Subregion has been unrelated to the real problems of development; that the methods used for importing technology in the past have had increasingly serious negative cumulative effects; that there has been a lack in the Subregion of any relation between the technological infrastructure and the various sectors of economic activity, and that the features of the consumer goods and of the consumption patterns adopted from third countries have had a decisive impact on technological requirements;

That to meet the needs of technical development Member Countries have in the main had recourse to external sources, with undesirable results such as application of solutions unsuited to the features of the Member Countries' economic development and to the available factors of production; extremely high costs; limitations on the choice of alternative solutions; displacement of local activities and factors of production and insufficient use of local scientific and technological resources; the subjection of political and economic decisions to technological solutions imposed from abroad, and a series of needs felt unsatisfied owing to the inadequacy of imported technological solutions;

That technological development and the application of knowledge to productive activities have a decisive impact on the level and structure of employment of a society; and that current levels of unemployment and under-employment in the Subregion call for the use of labour-intensive techniques wherever this is economically feasible within Member Countries' development strategies;

That, bearing in mind that with regard to knowledge relative advantages are not given but created by determined effort, it is indispensable in technology to know of and co-ordinate systematically all endeavours to promote the domestic production of technology, the salvaging of skills already existing in the Subregion, the selection, importation, adaptation and assimilation of foreign technology, and the development of procedures for the application and use of know-how in productive activities;

¹ Quoted without change from the original document.

² From UNCTAD, *Preparation of a Draft Outline of a Code of Conduct on Transfer of Technology*. Selected principal provisions on national laws, regulations and policy guidelines; regional regulations and other material relevant to the preparation of a draft outline of a code of conduct on transfer of technology, TD/B/C. 6/AC. 1/2/Supp. 1/Add. 1, 142–155.

That, a high degree of concentration and imperfect organization are characteristic of the technology market, which places buyers at a serious disadvantage and led the Andean countries to approve Decision 24;

That, the passive attitude of developing countries towards alternative solutions and towards the different sources supplying technology to the international market reduces the possibility of applying technical solutions suited to their needs;

That programming is an essential requirement for technological development for various reasons, including the following:

- (a) Its object is to meet countries' varied practical needs;
- (b) Because technological activity in its initial stages, like any nascent activity, requires protection while it gains strength and matures;
- (c) Because fixed costs, often very high have to be incurred, and a choice has to be made among different areas in which a sustained effort is undertaken to improve their technological capacity and infrastructure in conformity with development priorities;
- (d) Because the technological market is such that great inequalities exist between those in possession of know-how and those in need of it, and that very often, owing to the monopolistic position enjoyed by sellers, these skills come on the market packaged together and tied to capital goods or highly-priced intermediate commodities;

That the process of subregional integration also makes it essential to have a joint technological development policy because of the multiple facets of development generated by that same process and of the need, likewise growing, of scientific and technological activities;

That, furthermore, integration requires a collective effort in the service of development of each one and particularly of the least developed of the Member Countries, so that technological solutions can be applied in conformity with national and subregional needs;

That, besides being a necessity, a subregional technological policy is an excellent opportunity, created by the same integration process, for the solution at considerable saving in costs of problems common to the Member Countries, and for the satisfaction of the needs arising from the growing interdependence of their economies;

That the new forms of production which the expansion of the market allows are much more complex than those already in existence and create a need for constant and systematic pursuit of technological development;

That at the same time the resources available in the Subregion are not only larger in quantity in relation to those of the Member Countries, but are also much more diverse, so that great versatility is required in research and specialists can be trained whom it would be uneconomic to employ in each country separately;

That, lastly, in technological activity it is also possible to obtain substantial scale economies through expansion of the market, owing to the high fixed costs that are inevitable in some very complex specialities and to reduction of the risks and uncertainties of the search for new skills;

That, as was acknowledged by the governments in the Declaration of Bogota and reaffirmed in Decision 24, the situation described above must be ended by a joint programmed effort to overcome the situation of dependency, make it possible to find domestic solutions consistent with resources, realities and needs of the Subregion, and formulate the technology import policy so as to aid instead of hinder the development effort.

Declares the following:

1. The formulation and adoption of a subregional technological development policy is an indispensable aid to attainment of the goals of the integration process and satisfaction of the economic and social development needs of the Member Countries. This policy must have set goals, practical instruments for reaching them and an order of priority of the areas in which it is to be implemented. For that purpose the Member Countries will establish gradually and progressively a scientific and technological infrastructure comprising the aggregate knowledge the Subregion will have to use for the satisfaction of its needs, the persons capable of mastering these skills and using them productively, and the institutional organization indispensable for cooperation with the centres for the generation or assimilation of special know-how and the firms or persons using it. A policy of this kind is only part of the global effort the countries should undertake in the acquisition of knowledge, and should be closely coordinated with the development of education at all levels and of scientific research.

2. The Subregional Technological Development Policy will be executed by the Member Countries in successive stages, in the first of which information will be exchanged and the existing technological infrastructure improved or, where it does not exist, created by the execution of specific projects and the use of incentives, and also by the training of national groups whose main concern will be the promotion and use

of the technological factor in economic and social development. The main goal of this initial stage will be, first, to upgrade and establish the necessary linkages between the centres or bodies that create technology, the institutions that formulate and implement economic and social development policy, and the production units that use technical know-how, and secondly to show in a practical and effective manner that in countries such as those of the Andean Group the competent handling of the technological factor is feasible and desirable owing to the possibility of obtaining, within a relatively short term substantial improvements in production, productivity and even the yield of investments, and also in the solution of most important social problems.

In the second stage there will be an appraisal of the results obtained in the first and of the efficacy of the means used therein, so as to retain those that have proved most effective in attaining their objects.

The Member Countries will establish, where appropriate, financial mechanisms for the steady and systematic promotion of technological development at the national and subregional levels.

3. The subregional technological development policy will be applied in the following main areas: (a) importation; (b) assimilation; (c) salvage of skills existing in the Subregion and adaptation and creation of technology; (d) application and use of technology in productive activities; and (e) an information system to support and integrate corresponding action in the other four areas.

Since it can be expected that a great many productive activities will for a long time to come be dependent on the use of technological inputs imported from outside the Subregion and that it will always be necessary to use some special skills developed in the rest of the world, the Member Countries will have to adopt mechanisms and procedures that will enable them to overcome the negative effects inherent in the present methods used in the importation of technology.

The traditional practice of purchasing technology in sealed "packages" should be reformed, for these "packages" contain elements of very diverse value, many of which could be locally produced or furnished by local suppliers. To remedy the negative effects of this practice, the contents of such technological "packages" should be studied in detail and broken down so that the most suitable technological elements can be purchased under the most advantageous conditions, and demand channelled towards local suppliers for the items these can furnish.

4. Imported technological inputs should be used in such a way as to enrich the stock of special knowledge and improve the national technological infrastructure. To that end, through experience gained during the negotiation and breakdown of imported technology, a more adequate definition of the type of technology required should be obtained and a steady demand directed towards subregional sources of technology; in this way subregional effort will supplement imported elements, so that, among other effects, foreign technological contributions can be assessed at their true value and assimilated, and more use can be made of subregional potential and infrastructure.

5. Simultaneously with the application of the measures described in the preceding paragraphs with reference to the importation and assimilation of foreign technology, the Member Countries will carry out a series of operations to promote the creation and use of domestic skills and adapt foreign technology to local needs and to the special features of the Subregion. Since a very high percentage of innovations are produced in industrialized countries having needs and characteristics that differ widely from those of the Subregion, these operations for the adaptation and creation of technology are vitally necessary, the more so since, in certain areas of the greatest importance to the economies of the Member Countries, these have to develop their own potential in order to prevent the perpetuation of an exceedingly undesirable dependence. Some social problems of the utmost importance must be solved and some special needs of small industry filled within the Subregion, and these need local technology.

6. The operations indicated in the foregoing paragraphs require a continuous, adequate and timely flow of information, and therefore the establishment of a subregional information system with the following basic features:

- (a) The information shall be of substantive nature in order to meet the practical needs of formulating and implementing a Subregional Technological Development Policy in the actual areas where this is applied;
- (b) The information system shall be created progressively, stressing the collection and prompt supply of the information to users rather than its mere storage in centres or specialized agencies;
- (c) Bearing in mind, on the other hand, that information is not neutral and that its processing affords opportunities for influencing policy decisions, control of the system and responsibility for its use should be vested in the Member Countries or the Subregional institutions created in the integration process.

Decides:

To approve the following

Bases for a Subregional Technology Development Policy

Chapter I Definitions

Article 1. For the sole purpose of delimiting the scope of the following terms used in this Decision, they are defined as follows:

Technology: The aggregate of indispensable knowledge needed for the operations involved in the transformation of inputs into products, in the use of these or the rendering of services.

Core technology: The aggregate of knowledge inherent in or specific to and distinctive of a productive process or the rendering of a service.

Peripheral technology: The aggregate of knowledge that is not specific to the manufacture of a product or to a process or to the rendering of a service, but is necessary for the application of core technology to the production of goods or services or to the development of other special skills.

Technological breakdown: Analysis of a technology for the production of an article or the rendering of a service or of the process of execution of a project, from start to finish; into its component parts or stages, distinguishing between its core and peripheral components in order to improve the negotiating position of the purchaser of technology, create demand for national or subregional services or goods, assist the process of assimilation and contribute to that of programming.

Generation of technology: The introduction, for use in productive operations, of a technological skill previously non-existent in a Member Country, by its copy, adaptation, or creation.

Creation of technology: Attainment of an original solution to a problem of production of goods or services.

Adaptation of technology: Modification of an existing technological solution in order to make it more efficient under given socio-economic and technical conditions.

Copy: The process of reproducing unaltered an existing technology, process or product.

Assimilation: The process of attaining a complete understanding of a technology, permitting not only its use in productive operations but also such action as —

- (a) Its reproduction, adaptation and improvement;
- (b) The extension of its application to new areas or problems;
- (c) Its full explanation and transmission to third persons;
- (d) The realization of further developments stemming from the capacity thus acquired.

Chapter II The Subregional Technology Development Policy

Article 2. The Member Countries have agreed to adopt a Subregional Technological Development Policy for the purpose of —

- (a) Promoting the application of knowledge that, under the economic and social conditions prevailing in the Subregion, is the most favourable and appropriate for satisfaction of the practical needs arising from fulfilment of the subregional development process and for the attainment of its national goals;
- (b) Progressively overcoming the internal and external limitations that may constrain in this area the autonomy of their decisions regarding their development processes;
- (c) Progressively eliminating the inequalities existing in this area between the Member Countries through the adoption of procedures to further the advancement of the relatively less developed.

Article 3. The Member Countries undertake to adopt the necessary measures to attain the goals indicated in article 2, particularly those which are indispensable for the establishment of close and systematic relations between the bodies formulating and executing national development policy, the agencies evolving scientific and technical knowledge and its users.

Article 4. For the purposes stated in articles 2 and 3, the Member Countries at the national and subregional levels, shall carry out through the combined use of human, financial, scientific, technical and infrastructural resources, concrete actions in areas such as —

- (a) The programming of scientific and technological activities;
- (b) The creation and protection of subregional technology;
- (c) The evaluation, selection and control of imported technology;

- (d) The copy, assimilation and adaptation of foreign technologies;
- (e) The incorporation of appropriate technology in the production of goods and services;
- (f) The search for, acquisition and dissemination of data concerning technologies available in national and subregional areas or in third countries and the conditions for their marketing and transfer;
- (g) The development of the infrastructure needed for the aims set out in the preceding sub-paragraphs;
- (h) The development and adoption of appropriate mechanisms for technical standardization, quality control, certification and metrology;
- (i) The salvage and appropriate use of technological and scientific assets evolved by the Subregion in the past in such areas as native skills and skills acquired from experience in production and from systematic research;
- (j) The identification and differentiation of the branches of production suitable for the use of capital-intensive or of labour-intensive technology;
- (k) The search for, acquisition and application of technology appropriate to the scale and features of small- and medium-sized industry.

Article 5. The formulation and implementation of the Subregional Technological Development Policy shall be gradual and progressive in the areas to which the countries have accorded priority on account of their social-economic importance.

Article 6. The Subregional Technological Development Policy shall pay special attention to the social problem of the Member Countries and those relevant to the protection and rational exploitation of natural resources, the defence of traditional exports against the development of substitutes and the need to promote the diversification of exports, particularly products having a high local added value.

Chapter III

Importation and Assimilation of Technology

Article 7. Without prejudice to any common criteria established under article 2 of Decision 24, the competent national bodies of the Member Countries shall evaluate applications for the importation of technology, taking into account among others, the following considerations:

- (a) Its effect on such aspects of technological development as the creation of demand for subregional scientific and technological activities, the use of local engineering and advisory services, and the possible effects of the technology incorporated in the project;
- (b) Its effects on employment;
- (c) Its contribution to specific development plans of value to the country or the Subregion;
- (d) Its effects on the balance of payments and national income;
- (e) Its effects on the environment.

Article 8. In applications for the approval of contracts for the importation of technology related to investment projects considered by the competent bodies to be of national interest, the applicant shall submit to the competent national agency the information in his possession about alternative technological solutions, possible sources of the technology, the conditions for its negotiation, and the reasons for his choice.

Article 9. The competent national agency may require that besides the information required by articles 2 and 19 of Decision 24, applications for the importation of technology shall be accompanied by information permitting the separate identification of the core and the peripheral technologies comprised in the import. This analysis of the technological components shall enable the technology that must be obtained from abroad to be distinguished from the know-how obtainable locally.

Article 10. The national bodies competent to grant technology import authorizations shall when necessary acquaint users with the technological breakdown procedure indicated in the preceding article. For this purpose they shall act jointly with other national bodies able to cooperate in this task and shall encourage participation by national research organizations.

Article 11. The Member Countries shall incorporate in the rules, guidelines and criteria for the preparation, evaluation, financing, auctioning and implementation of studies and projects, clauses requiring application of the principles prescribed by Decision 24 and by this Decision to govern the importation of technology.

Chapter IV

Assimilation and Generation of Technology

Article 12. Member Countries shall encourage the assimilation and development of technology in their territories by adopting among other measures.

- (a) Establishment of the procedures necessary to increase capacity for the development of technology and incentives to ensure demand for and application of its results;
- (b) The requirement that, in contracting for research, advisory and project engineering services, government agencies, institutions and undertakings in Member Countries shall in comparable circumstances prefer individuals of Andean nationality or national, mixed or multinational Andean enterprises to individuals or enterprises of other countries;
- (c) The requirement that contracts for services concluded by government agencies, institutions and undertakings with firms of consultants from third countries shall provide that the service be rendered with the participation of national or mixed enterprises of Member Countries or of multinational Andean enterprises;
- (d) National policies and procedures designed to bring private firms under the regulations indicated in sub-paragraphs (a) and (b) above;
- (e) After evaluation of the pertinent needs, institution of financing systems or lines of credit to provide resources for contracting for research, advisory and engineering services to be rendered by national, mixed or multinational Andean institutions or enterprises, or by individuals of any Member Country;
- (f) After evaluation of the pertinent needs, the establishment of systems of financing and risk capital at the national and subregional levels to finance the development, adaptation or assimilation of the technology obtained by activities of national individuals, universities or institutions for its incorporation in the productive system.

Article 13. The Commission, on proposals of the Junta, shall approve Andean Technological Development Projects for the solution of specific problems of joint interest in the assimilation, adaptation or creation of technological and scientific knowledge and in the application or use of existing knowledge. Such projects shall also be used for the evaluation and establishment in the Subregion of the most appropriate forms of international cooperation in the development of technology.

Where two or more Member Countries submit to the Junta a proposal for an Andean Technological Development Project in a specified area, the Junta shall analyze the project, inform the Commission of its opinion on the merits of the project, and submit its Proposal, if any.

Article 14. In identification of the priority areas and specific problems to be tackled by Andean Technological Development Projects, the Junta shall take into consideration the national development plans and policies and the technological needs of the Member Countries, and shall in the formulation of its proposals seek through the national liaison office for integration matters the advice of the bodies preparing and executing those development plans.

Article 15. Decisions approving Andean Technological Development Projects shall be adopted by a two-thirds majority vote of the Member Countries, in conformity with the general voting system provided by article 11 of the Cartagena Agreement. At the time of the vote any Member Country may announce that it does not intend to participate in a particular Andean Technological Development Project, whereupon the agreed rules governing the Project shall not be applicable to it.

Article 16. Andean Technological Development Projects shall contain provisions covering —

- (a) The definition of the particular problem;
- (b) The purpose of the Project and the grounds justifying its selection from among the possible alternatives;
- (c) An estimate of the potential economic and social benefits to be derived from the Project;
- (d) An estimate of the benefits relating to the training of staff;
- (e) Specification and organization of the scientific and technological operations necessary for the execution of the Project;
- (f) Assessment of the necessary human, scientific, technical and financial resources;
- (g) Estimated duration of the execution of the Project;
- (h) Mechanisms and criteria for the appraisal and control of the execution of the project;
- (i) Modes of cooperation among the Member Countries, with a list of the participating national bodies and the form their participation shall take;
- (j) Measures needed to ensure the application and full use of the results of the Project by the Member Countries.

Article 17. Andean Technological Development Projects shall include —

- (a) A financing plan and a statement of the financial contributions of the participating Member

Countries. They shall also consider, when appropriate, the use of supplementary sources of finance;

- (b) A plan of the contributions of the participating Member Countries in staff, equipment, physical space and other resources.

Article 18. Each project shall be directed and managed by a Contracting Committee formed by representatives of the participating countries and an official specially appointed for the purpose by the Junta. The constitution and functions of the Committee shall be specified in each Project.

Without prejudice to the foregoing, each Committee shall —

- (a) Prescribe administrative rules and procedures, including the designation of the persons who shall have charge of the progress of the Project;
- (b) Conclude the contracts for the execution of the Project and delegate this authority to deputies when necessary;
- (c) Direct and supervise the progress of the Project in accordance with the agreed guidelines;
- (d) Administer the funds assigned to the Project in the manner most appropriate to its aims, and determine the final destination of the goods purchased during the execution of the Project.

Chapter V

Support Tasks for Joint Programming

Article 19. In preparing its Proposals for Sectorial Industrial Development Programmes the Junta shall consider the effect of each programme on the technological development of the Member Countries, with particular regard to the creation of demand for scientific and technological activities in the Subregion and to the appropriate incorporation of new technologies. In these matters the Junta shall give special attention to the situation in Bolivia and Ecuador.

Article 20. The bodies administering the subregional Sectorial Industrial Development Programmes shall adopt measures to promote the technological development of the programmed sector in conformity with the purposes indicated in article 2 of this Decision and, when appropriate, shall adopt such measures as —

- (a) Joint search for appropriate alternative technological solutions, sources and negotiating conditions for the satisfactory completion of the programme;
- (b) Provision of Member Countries with advice on feasibility studies for the implementation stage, for the purpose of identifying and breaking down the technologies that can most effectively further the aims of the programme;
- (c) Establishment of training systems to provide qualified staff for the study, installation, management and execution of industrial projects related to the programme;
- (d) Periodical revision of progress in the programmed sector at the subregional and world levels, in order to keep the relevant technological information up to date.

Article 21. The reports to be submitted to the Junta by Member Countries concerning the production assigned to them under a Sectorial Industrial Development Project shall include a statement of the technological alternatives considered and shall indicate the criteria used in the selection of one of these. They shall likewise include a breakdown of the technological content of the selected solution to allow the identification of technology that can be developed in the Subregion.

Article 22. In the preparation of rationalization programmes for existing industry, and agricultural, stock-breeding and physical integration programmes and in any other activities in which it is feasible, the Junta shall take steps to intensify the application of the technological development policy and instruments, and particularly of those indicated in article 4 of this Decision.

Chapter VI

Other Provisions

Article 23. Pursuant to the provisions of article 6 (c, e) and articles 48, 52 and 55 of Decision 24 and of the provisions of this Decision, the Junta shall within 120 days after the adoption of this Decision submit to the Commission a programme for the progressive organization of a subregional technological information system.

Article 24. The Member Countries undertake to negotiate within the Board of Directors of the Andean Development Corporation the adoption of measures to ensure its active participation in the development of the activities arising from their common technological policy, particularly in the financing of —

- (a) Activities for the generation of subregional technology;
- (b) Activities in the search, selection, adaptation and breakdown of imported technologies;
- (c) The contracting of subregional research, advisory and project engineering services;

- (d) Andean Technological Development Projects;
- (e) Professional training and specialization programmes for the execution of the Subregional Technological Development Policy.

The Member Countries undertake to procure within the Board of Directors of the Andean Development Corporation the incorporation in its promotion and development activities of the technological criteria arising out of this Decision.

Article 25. The Commission, on the proposal of the Junta, shall approve Decisions intended to —

- (a) Promote the integration of the subregional technological market by means of the active interchange of knowledge between the Member Countries;
- (b) Create incentives for the assimilation, adaptation and creation of technology, and particularly for the provision of credit lines and risk capital to promote the assimilation, breakdown and development of technology in the Subregion, and for the use of such know-how in economic or social interest activities.

Article 26. The Member Countries agree to endeavour to attain close and efficient coordination in order to present a common position on technological matters to international technical cooperation, financing and credit organizations.

Article 27. The Junta in conjunction with the Member Countries shall promote cooperation and collaboration among the institutions engaged in the development of technology in the Subregion.

Article 28. For the purpose of facilitating Member Countries' action in fulfillment of the obligations contracted under Decision 24 and this Decision, the Commission, on the proposal of the Junta, may approve —

- (a) Specific projects for the search, selection and breakdown of technology;
- (b) Training programmes for the human and institutional infrastructure needed for the application of the aforementioned Decisions.

Temporary Provisions

Article A. In order to comply with the provisions of article 48 of Decision 24 of the Commission, and until the information system mentioned in article 23 of this Decision can be set up, the Member Countries from 31 August 1974 onwards shall submit to the Junta every six months a full statement of the technology imports they have authorized.

The information, which shall be set out in the form indicated in the Annex to this Decision, shall be processed by the Junta and distributed by it to the Member Countries.

Article B. Within 120 days from the adoption of this Decision, the Junta shall submit to the Commission for its approval a Proposal concerning the ownership, use and administration of the knowledge developed in Andean Technological Development Projects.

Article C. Pending approval by the Commission of the Proposal mentioned in the preceding article, each Andean Technological Development Project shall include the regulations regarding ownership, use and administration of the knowledge in the project.

Annex

Guidelines for the Transmission by Member Countries to the Junta of Information on the Importation of Technology

Contracts for the importation of technology shall be described by the following data:

Concessionary or licensee (name and industrial branch)

Grantor or licensor (name and nationality)

Affiliation between concessionary and grantor, if any

Particulars of the technology being transmitted and its intended use

Description of the subject of the agreement: process technology, product technology, trademarks, patents, technical assistance, operative know-how, training technology, trademarks, patents, technical assistance, operative know-how, training

Mode of payment of royalties (fixed and variable parts, and basis for the variable payment); amount of the fixed sums or periodical payment, and percentages where payments are variable.

Appendix IV

Decision No. 85* of the Cartagena Agreement Commission¹

(* Decision 85 was adopted during the 13th period of the Extraordinary Meetings of the Commission of the Cartagena Agreement, May-June 1974.)

Regulations for the Application of Rules Concerning Industrial Property in the Signatory Countries of the Acuerdo de Cartagena²

Chapter I Patents

I. Requirements for Patentability

1. A patent shall be granted for new creations of industrial application and for improvements of such creations.

2. An invention shall not be considered as new if it forms part of the prior art, that is to say, if it has been made available to the public anywhere by means of an oral or written description, or by use or exploitation, or in any other way that would enable it to be implemented, before the date of filing of the patent application. Notwithstanding the provisions of this Article, disclosure of the invention during the year preceding the filing of the application shall not entail loss of novelty, where such disclosure resulted from:

(a) an evident abuse to the detriment of the applicant or his successor in title, such as illicit obtaining of plans or documents, misconduct or disloyalty on the part of the inventor's agent, colleagues or employees, industrial espionage or the like;

(b) the fact that the applicant or his successor in title has displayed the invention at an exhibition officially organized and recognized in one of the Member Countries or has carried out experiments to establish its industrial application.

3. An invention shall be capable of industrial application if its subject can be manufactured or used in any kind of industry.

4. The following shall not be considered inventions:

(a) principles and discoveries of a scientific character;

(b) the mere discovery of matter existing in nature;

(c) commercial, financial, accounting or similar plans; the rules of games or other systems to the extent that they are of a purely abstract nature;

(d) therapeutic or surgical methods for human or animal treatment and methods of diagnosis;

(e) purely aesthetic creations.

5. Patents shall not be granted for:

(a) inventions contrary to public order or morality;

(b) plant varieties or animal breeds or essentially biological processes for the production of plants or animals;

(c) pharmaceutical products, medicaments, therapeutically active substances, beverages and foodstuffs for human, animal or vegetable use;

(d) foreign inventions where the patent is applied for one year after the filing date of the patent application in the first country in which it was applied for. Once this period has expired, no rights derived from such an application shall be enforceable;

(e) inventions affecting the development of the Member Country concerned or processes, products or groups of products from patentability by the Governments.

¹ Quoted without change from the original document.

² From *Industrial Property*, monthly review of the World Intellectual Property Organization, 13th year, No. 11, November 1974, 437-443.

II. Patentees

6. Patentees may be natural persons or legal entities. The right to a patent shall be presumed to belong to the first person to file the application.

If several persons have jointly made an invention, the right shall be held by them in common.

7. Where a patent application includes an invention illicitly obtained from the inventor or his successors in title or where it is the result of the non-performance of a contractual or statutory obligation, the injured person may, within 90 working days after the date of publication of the patent application, claim to be recognized as the true owner, or he may take legal proceedings if the patent has already been granted and he has not claimed his right through the administrative channel.

In the case of the opposition provided for in this Article, the competent national Office shall, as soon as it has received the notice of opposition, refer the matter to the competent judicial body. In such event, the applicant for the patent shall, having served a writ of summons, contest the opposition in accordance with the procedure laid down in the Member Country concerned.

The proceedings provided for may only be brought within two years after the grant of the patent.

8. An invention made by an employee or an agent engaged for the purposes of research shall belong to the employer or the person having commissioned the work, unless provided otherwise. In all other cases, the invention shall belong, without any possibility of waiver, to the employee or agent, except where by reason of his duties he has had access to secrets or confidential research work.

9. The inventor shall be entitled to be named as such in the patent and he may similarly oppose such mention. These rights cannot be waived.

10. The first application for a patent filed for the first time in any Member Country shall confer upon its owner a right or priority for a period of one year following the date of the said application, during which time he may apply for a patent for the same invention in the other Member Countries.

III. Patent Applications

11. Applications for patents shall be filed with the competent national office and shall contain:

(a) the complete name — or trade name — and the address of the applicant or, where applicable, of the inventor;

(b) the title or name of the invention; and

(c) the object or purpose of the invention.

12. The application shall be accompanied by:

(a) the power of attorney, where necessary;

(b) proof of payment of the relevant fees, where applicable;

(c) the documents proving the existence of the legal entity making the application and stating the persons empowered to represent it;

(d) relevant plans and drawings;

(e) a clear and complete description of the invention enabling a person skilled in the art to carry it out;

(f) one or more claims specifying the extent of novelty and industrial application of the invention; and

(g) an authenticated copy of the first patent application filed in respect of the same invention.

13. A patent may cover a single creation or invention or only a group of directly related inventions which form a unity.

IV. Processing of the Application

14. When an application is filed, the competent national office shall examine whether it is in conformity with Articles 5(a) and (d) and 11 and 13 and whether it is accompanied by the documents referred to in Article 12.

15. If the examination shows that the application does not fulfill the requirements in the preceding Article, the competent national office shall state its objections, so that the applicant may present his comments or supplement his application within 60 working days — which may be extended by an equal period, where justified by the circumstances — without losing his priority.

If, at the end of the period referred to, the applicant has not fulfilled the requirements specified, the application shall be considered abandoned and no declaration to that effect shall be necessary.

The description, claims and plans or drawings may be amended only for the purpose of remedying a defect pointed out by the Office.

16. If the application does not call for observations or has been duly completed, an order shall be made for its publication in one issue of a suitable organ of publicity together with an abstract of the description of the invention and the claims.

17. Within 90 working days after the date of publication, any person may file observations, together with his reasons, which may adversely affect the patentability of the invention.

18. If observations have been filed within the time limit prescribed in the preceding Article, the competent national office shall notify the applicant so that he may, within 60 working days, submit his arguments and documents or redraft the claims or the description of the invention.

19. Once the time limits provided in Articles 17 and 18, as the case may be, have expired, the competent national office shall examine whether the application is patentable in accordance with Articles 2, 3, 4 and 5(b), (c) and (e) and in the case of a patent for an improvement, whether the subject of the patent constitutes the improvement claimed.

20. If the final examination is favorable, the patent shall be granted.

If the examination is favorable in part, a patent may be granted by a decision containing the reasons and including only the claims accepted.

If the examination is unfavorable, the patent shall be refused by a decision containing the reasons for the refusal.

21. Member Countries may decide to carry out a complete examination into the prior art which may affect the patentability of inventions in specified sectors of industry.

22. The competent national offices may request reports from experts or scientific and technological institutes that they regard as qualified to express an opinion on the novelty and industrial application of the invention.

23. The competent national office shall number the patent and order the publication of the claim or claims of the invention.

Any person may obtain at his expense a copy of patents granted.

24. Where an invention relates to national security or to processes, products or groups of products reserved to the Government or where specified by law, the grant of a patent may be made subject to conditions governing its working. In such a case, the administrative act granting the patent shall state the reasons.

25. For the arrangement and classification of patents, the Member Countries undertake to adopt, within one year from the date of entry into force of this Decision, the International Patent Classification of December 19, 1954.

26. The Member Countries undertake to keep each other informed and to inform the Junta [of the Cartagena Agreement] of patents granted or refused by their competent national offices. For this purpose, the Junta shall send to Member Countries the necessary guidelines for the exchange of the said information.

V. Rights Conferred by the Patent

27. The extent of the protection conferred by a patent shall be determined by the terms of the claims. The description and the drawings or plans shall be used to interpret the claims.

28. Within the limits laid down in these Regulations, the patent shall confer on its owner the exclusive right to work the invention for his own account, to grant one or more licenses for its working and to receive royalties or compensation for its working by third parties.

The patent shall not confer the exclusive right to import the patented product or a product manufactured by the patented process.

29. The patent shall be granted for a maximum term of ten years from the date of the administrative act by which it was granted. It shall be granted initially for five years and, to obtain an extension, the patentee must prove to the competent national office that the patent is being adequately worked.

VI. Obligations of the Patentee

30. The patentee shall:

(a) within three years from the date of the grant of the patent, notify the competent national authorities of the commencement of working. Where no such notification is made, the working shall be presumed not to have begun, for the purposes of the grant of compulsory licenses under Article 34;

(b) register with the competent national office any contract entailing the assignment, licensing or other form of utilization of the patent by third parties in any capacity.

The obligations provided for in subparagraphs (a) and (b) shall be discharged by the patentee or by the successors in title, assignees, licencees or any other person having a right derived from the patent.

31. Working shall mean the permanent and regular use of the patented processes or the manufacture of the product covered by the patent in order to put the end result on the market under reasonable marketing conditions, provided that such acts have occurred on the territory of the Member Country which granted the patent, without prejudice to the provisions of the Sectorial Industrial Development Programs referred to in Articles 33 and 34 of the Cartagena Agreement.

VII. Licensing

32. A patentee may grant a license to work the patent only by means of a written contract.

License contract must be approved and registered by the competent national office.

33. The competent national office shall not authorize the conclusion of license contracts for the working of patents where such contracts are not compatible with Article 20 of Decision No. 24 of the Commission of the Cartagena Agreement.

34. After three years from the grant of a patent, any person may apply to the competent national office for a compulsory licence to work the patent if, at the time of the application and in the absence of a legitimate reason recognized as such by the office, any of the following has occurred:

- (a) the patented invention has not been worked in the country;
- (b) the working of the said invention has been suspended for more than one year;
- (c) the working of the invention does not meet the demand of the national market on reasonable terms as to quantity, quality or price;
- (d) the patentee has not granted contractual licenses on reasonable terms enabling a licensee to meet the demand of the national market on reasonable terms as to quantity, quality or price.

After five years from the grant of the patent, a compulsory license may be granted by the competent national office without there being any need to prove the facts referred to in subparagraphs (b), (c) and (d) of this Article.

The holder of a compulsory license shall pay suitable compensation to the patentee.

35. The competent national office may at any time grant a license to a patentee who requests such a license and duly proves to the said office that the working of his own patent necessarily requires the use of another patent.

36. The amount of compensation shall be fixed by the competent national office after hearing the parties. Within 30 working days from the notification of the decision, either of the parties may, once the administrative remedies have been exhausted, appeal to the competent judicial body.

The appeal shall not preclude the working of the patent and shall have no effect on any time limits that have not expired. It shall not prevent the patentee from collecting, in the meantime, such part of the royalties determined by the office which is not contested.

37. At the request of the patentee or of any licensee, the license terms may be modified by the authority that approved them, after the parties have been heard, where new factors so justify and, in particular, where the patentee has granted a license under more favorable terms than those laid down.

38. The licensee may not assign the license or grant sub-licenses without the authorization of the patentee and of the competent national office and, in any event, the patent concerned must continue to be adequately worked.

The obligation on the patentee to prove the commencement of working shall apply to the licensee.

39. In the case of patents affecting public health or where the national development so requires, the Government of a Member Country may make a patent subject to compulsory licensing at any time; in such a case, the competent national office may grant licenses whenever requested.

40. Licenses which do not comply with the provisions of these Regulations shall have no effect.

VIII. Legal Protection

41. At the request of any person or ex officio, the competent national office, after hearing the parties, may revoke a compulsory license where the licensee is making inadequate use of the invention.

42. Anyone who works a patent without having concluded a license contract with the patentee or without the authorization of the competent national office shall, ex officio or at the request of a party and after the alleged infringer has been heard, be liable to a fine imposed by the Office in favor of the national treasury; this provision shall be without prejudice to the remedies and actions provided in the laws of the Member Countries.

43. Where a patent is worked pursuant to a contract which has not been authorized by the competent national office, the contracting parties shall be liable to a fine.

IX. Nullity of Patents

44. A patent may, ex officio or at the request of any person and after the patentee and the licenses have been heard, be declared null and void by the national office which granted it where the invention was not patentable under Articles 1, 2, 3, 4 and 5 of these Regulations or did not fulfill the requirement in Article 12 (e).

If the provisions referred to in the preceding paragraph are only partially applicable to a patent, the declaration of nullity shall be limited to the objectionable claim or claims.

Chapter II

Industrial Designs

45. New industrial designs may be registered.

Any composition of lines or combination of colors which is embodied in a product of industry or handicraft in order to give it a special appearance, without changing its purpose, shall be considered a design; any three-dimensional form which serves as a pattern for products of industry or handicraft which give it a special appearance and do not imply any technical results shall be considered a model.

Industrial designs relating to clothing shall not be registrable.

Industrial designs that are contrary to public order or morality shall not be protected.

46. An industrial design shall not be new if, before the date of application or before the priority date validly claimed in respect thereof, it has been made available to the public, anywhere and at any time whatever, through description or use, or in any other way.

An industrial design shall not be new solely by reason of the fact that it differs from earlier embodiments in minor respects or that it concerns a type of product different from the said embodiments.

47. Applications for registration shall contain: (a) the complete name — or trade name — and the address of the applicant; (b) a statement of the kind of products for which the industrial design is to be used and the class to which those products belong.

The application shall be accompanied by: (a) the power of attorney, where necessary; (b) the documents proving the applicant's existence, in the case of a corporation or association having legal personality; (c) a specimen of the article bearing the industrial design or a graphic or photographic representation of the design.

48. When an application is filed, the competent national office shall examine whether it is in conformity with Articles 45 and 47.

49. If the examination shows that the application does not fulfill the requirements in Article 45, it shall be refused; in other cases, objections shall be stated so that the applicant may supplement his application, make corrections or add the documents specified in Article 47 within 60 working days, without priority being lost thereby.

If, at the end of the period referred to, the applicant has not fulfilled the requirements specified, the application shall be considered abandoned and no declaration to that effect shall be necessary.

50. If the application does not call for observations or has been duly completed, an order shall be made for its publication in one issue of a suitable organ of publicity.

51. Within 30 working days after the publication, any person having an interest may oppose registration.

52. If no opposition is entered, or if opposition is rejected, the competent national office shall carry out an examination as to the novelty of the industrial design.

If the examination is favorable, registration shall be effected.

53. An application validly filed in one Member Country shall confer as right of priority for a period of six months, during which registration in the other Member Countries may be applied for.

54. The registration of an industrial design shall confer on its owner the exclusive right to use the design during a period of five years from the date of the administrative act by which registration was effected.

The owner of an industrial design may without restriction grant licenses or transfer it.

Any license or change of owner must be registered with the competent national office.

55. The Member Countries undertake to adopt, within one year from the date of entry into force of these Regulations, the International Classification established by the Locarno Agreement of October 8, 1968.

Chapter III

Marks

I. Requirements for Registration of Marks

56. Signs which are new, visible and sufficiently distinctive may be registered as trademarks or service marks.

57. Cooperatives, associations of public or private enterprises, communal or collective bodies or any other groups of legal entities may have collective marks registered to distinguish their goods or services.

58. The following may not be registered as marks:

(a) marks which are contrary to morality or public order, or those which are liable to deceive trade circles or the public as to the nature, the source, the manufacturing process, the characteristics, or the suitability for their purpose, of the goods or services concerned;

(b) shapes that are usual or essential in relation to the goods, and their dimensions and colors;

(c) descriptive or generic terms in any language and sign which may serve to designate the kind, quality, quantity, intended purpose, value or time of production or supply, of the goods or services concerned;

(d) words which, in the current language or trade practices of the Member Countries, have become a usual designation of the goods or services concerned, or their equivalents in other languages;

(e) marks which reproduce or imitate without authorization the armorial bearings, flags and other emblems or names of any State or any intergovernmental international organization created by an international convention;

(f) marks which are liable to be confused with others already registered or applied for by a third party, or subsequently applied for with a valid claim to priority, for goods or services in the same class;

(g) marks which are liable to be confused with others which are well known and registered in the country or abroad for the same or similar goods or services;

(h) names, pseudonyms, signatures or portraits of living persons, except with their written consent; names of deceased persons except with the consent of their heirs; and historical names;

Nevertheless, such consent is not required in the case of a natural person applying for the registration of his own name, provided that it is presented in a form sufficiently peculiar and distinct to distinguish it from the same name when used by other persons;

(i) names, signs or denominations which might suggest a connection with persons living or dead, or national institutions, creeds, places or symbols, or which might expose them to discredit or ridicule;

(j) translations of marks registered in another language or well-known foreign marks, except when application is made by the owner of the mark; and

(k) translations in other languages of words not eligible for registration.

59. When a mark consists of a foreign word or a geographical name, the place of manufacture of the product shall be indicated beneath it in a visible and clearly legible form.

II. Registration Procedure

60. Applications for registration of a mark shall be filed with the competent national office and shall contain:

(a) the complete name — or trade name — and the address of the applicant;

(b) a clear and complete description of the mark submitted for registration; and

(c) a statement of the class or classes of goods or services in respect of which registration of the mark is sought.

61. The application shall be accompanied by:

(a) proof of payment of the relevant fees;

(b) the power of attorney, where necessary;

(c) the documents proving the existence of the legal entity making the application and stating the persons empowered to represent it;

(d) reproduction of the mark, where applicable.

62. When an application is filed, the competent national office shall examine whether it fulfills the requirements laid down by law or regulation and, in particular, whether it is in conformity with Articles 56, 58, 59, 60 and 61 of this Chapter.

63. If the examination shows that the application does not fulfill the requirements in Article 60 or that it was not accompanied by the documents provided for in Article 62, the competent national office shall inform the applicant so that he may make the necessary corrections or supply the missing documents with 60 working days, without any adverse effect on the priority provided for in this Chapter.

64. If the requirements specified in Articles 56, 58 and 59 are not fulfilled, the competent national office, after hearing the applicant, may decide to reject the application.

65. If the application does not call for observations or has been duly completed, an order shall be made for the publication of an abstract in one issue of the organ of publicity determined by the domestic law of the Member Country concerned.

Within 30 working days after the publication, any person may oppose registration of the mark.

66. If opposition is entered within 30 working days, the competent national office shall deal with it in accordance with the domestic law of the Member Country concerned.

67. If no opposition is entered, or if opposition is rejected, the competent national office shall issue a certificate of registration.

68. The registration of a mark and its protection shall cover only one class. For registration in several classes, separate applications must be filed for each of the classes, the corresponding fees must be paid and each application shall be processed separately.

The Member Countries undertake to adopt the International Classification approved at Nice on June 15, 1957.

Member Countries which have not yet adopted that Classification, shall do so within one year from the entry into force of these Regulations.

69. Registration of a mark shall be for a period of five years from the date of grant and may be renewed indefinitely for periods of five years.

70. To have the right to renew, the applicant must prove to the competent national office that he is using the mark in question in one of the Member Countries.

71. The competent national office shall order the publication of registered marks in a suitable organ of publicity.

III. Rights Conferred by Registration

72. The exclusive right to a mark shall be acquired by the registration of the mark with the competent national office.

73. The acceptance of an application for registration of a mark in one Member Country shall give the applicant a right of priority during a period of six months so that, during that period, he may apply for registration in the other Member Countries.

74. The owner or licensee of a mark shall have the right to its exclusive use and may request the application of such protective measures for the defense of his rights as are provided for in the national laws of the countries concerned.

75. The owner of a mark may not oppose the importation or introduction of goods originating in other Member Countries and bearing the same mark. The competent authorities shall require the imported products to clearly and adequately identify the Member Country in which they were produced.

76. The registration of a mark shall be cancelled by the competent national office, ex officio or at the request of a party, if it finds that the registration has been granted contrary to Articles 56 and 58 of these Regulations.

77. If the competent national authority is satisfied that the owner or licensee has speculated in the mark or has made an improper use of it with respect to the price or quality of a product covered by it, to the detriment of the public or of the economy of the Member Country, a penalty shall be inflicted which may extend to the definitive cancellation of the mark or license concerned.

78. Member Countries may prescribe that not more than one mark be used for goods or services which have the same characteristics, are prepared or supplied by the same owner and are intended for the same purposes.

IV. Assignment and Transfer of Registrations

79. The owner of a trademark or service mark may assign or transfer it by written contract.

80. Assignments and transfers of marks carried out in accordance with the law of each Member Country must be recorded at the competent national office.

81. All license contracts must be submitted for the approval of the competent authority of the Member Country concerned and may not contain the restrictive clauses referred to in Article 25 of Decision No. 24 of the Commission of the Cartagena Agreement.

Chapter IV

Miscellaneous Provisions

82. All license contracts shall contain terms guaranteeing the quality of the goods or services supplied by the licensee.

83. The Member Countries shall refrain from unilaterally concluding agreements on industrial property with third countries or with international organizations which are contrary to the provisions of these Regulations.

84. Matters relating to industrial property which are not covered by these Regulations shall be governed by the domestic laws of the Member Countries.

85. Any industrial property right validly granted in accordance with the law of a Member Country before these Regulations come into force shall continue for the period for which it was granted. With regard to its exercise and enjoyment, obligations and licenses, renewals and extensions, the rules contained in these Regulations shall apply.

In the case of patents granted before these Regulations come into force, the time limits provided for in Articles 30 and 34 shall be counted from the date of such grant. If such a time limit has already expired, an additional period of one year from the entry into force of these Regulations shall be allowed.

Pending applications shall be subject to these Regulations.

86. The Governments of the Member Countries undertake to adopt all the measures necessary to incorporate these Regulations in their respective legal systems within six months after the adoption of this Decision.

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Cover design: Planned Graphics Limited

