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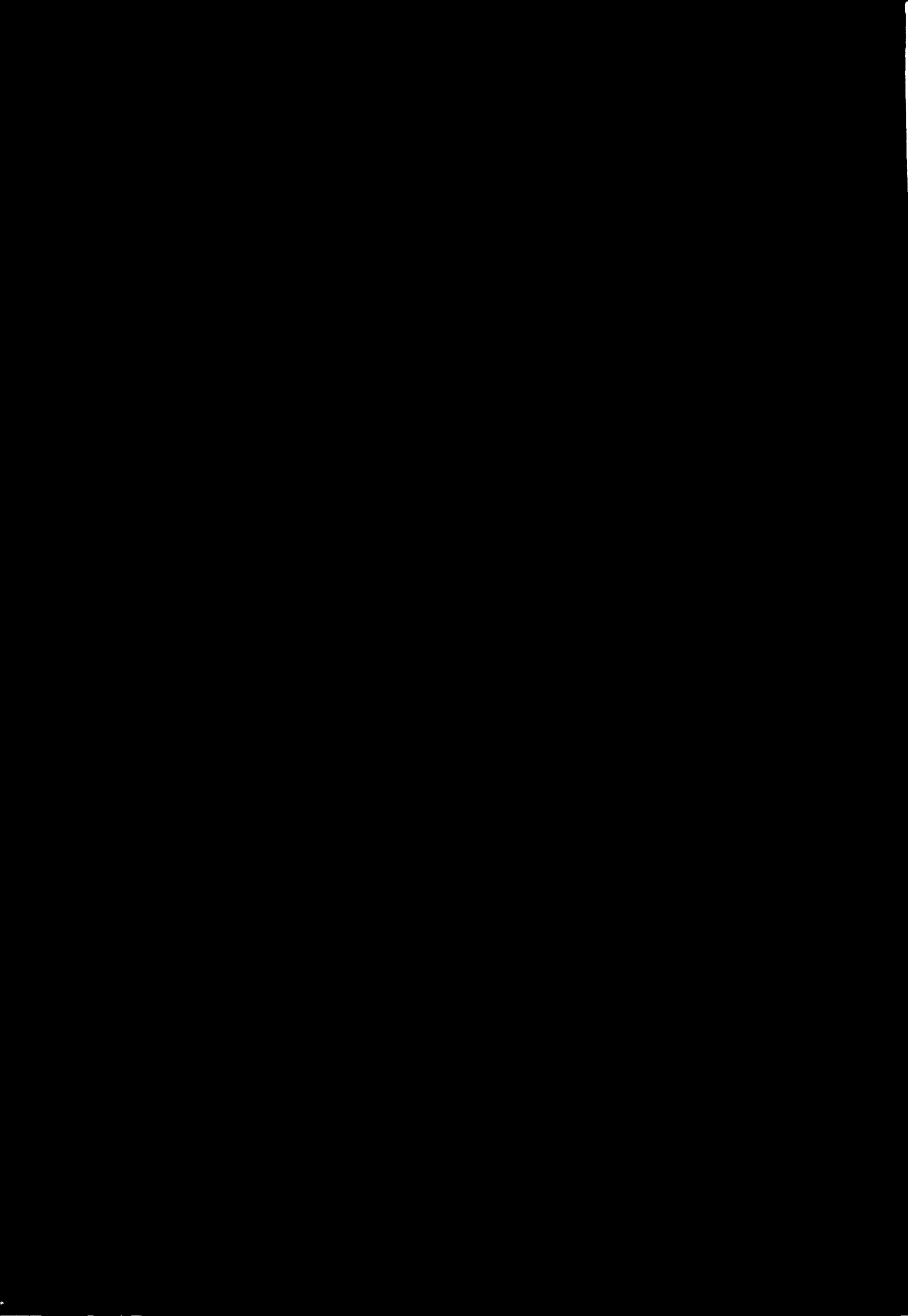
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07157



Distr.
LIMITED

ID/WG.228/11
16 August 1976

ORIGINAL: ENGLISH

United Nations Industrial Development Organization

National Consultations on Licensing,
Patents and Transfer of Technology

Montevideo, Uruguay,
20 - 24 September 1976

TRANSFER OF TECHNOLOGY
WITH SPECIAL REFERENCE TO MANUFACTURE OF MECHANICAL AND
ELECTRICAL EQUIPMENT IN DEVELOPING COUNTRIES ^{1/}

by

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1. The production of mechanical and electrical equipment covers a wide range of manufacturing activity, which is of particular significance in industrial programming in most developing countries. With progressive industrialization and improved living standards, the demand for mechanical & electrical equipment & products inevitably multiplies rapidly & extends to new & increasingly sophisticated products. Any significant growth-lag in this manufacturing sector tends to result not only in balance of payments problems and loss of employment opportunities but also in inadequate growth of technological skills & aptitudes.

2. Both these categories of equipment and products can be broadly classified under three subheads viz consumer durables, intermediate products and capital-goods in the form of finished machinery & equipment. In the case of mechanical equipment, consumer durables cover a large variety of products including metal furniture, household goods & fittings, bicycles, motorcycles, automobiles and the like; intermediate products include castings, forgings, standard parts, components & sub-assemblies; while capital-goods products extend to machine-tools, hand-tools, pumps and compressors, steam turbines, diesel engines, construction machinery and heavy mechanical equipment for various production sectors including agriculture, sugar & food-processing, cement, pulp & paper, iron & steel, mining, chemicals & petrochemicals and the like. Similarly, electrical equipment extends from consumer durables covering a wide variety of household electrical appliances to intermediate

products such as wires, cables, insulating material etc & to electrical machinery and equipment such as electric motors, transformers, power boilers, switchgear and circuit-breakers, power insulators and turbines & generators. The coverage of mechanical & electrical equipment is extremely extensive & the manufacture of such a wide range of products of varying degrees of complexity & sophistication undoubtedly has far-reaching implications for most developing economies. The acquisition of technology for such manufacture is also a fairly intricate process & takes different forms & varies in detail & complexity, depending on the nature of product or product mix. While manufacturing technology can be obtained fairly easily for a large number of consumer goods, it tends to become far more difficult for equipment products, the difficulties being accentuated with greater sophistication of the equipment products. Not only are technology sources more restricted but the nature of technology contract also becomes increasingly complex. Despite the great variation in the nature or pattern of technology contracts in this sector, it is nevertheless possible to highlight some of the principal issues & implications of technology transfer to developing countries in respect of some of the major categories of such equipment and products.

3. The growth of production of mechanical & electrical equipment or products tends to follow a fairly uniform pattern in most developing countries. In the earlier stages of industrialisation, there is greater emphasis on production of consumer-goods items which command a ready national market & for which operational skills can be developed without difficulty.

This takes the form of enterprises for production of sugar, textiles besides other consumer-goods manufacture, in respect of which equipment is wholly imported, together with replacement parts, components etc. As production skills grow & greater entrepreneurial activities develop, machinery repairs are locally undertaken, together with production of relatively simple machinery replacement items & products, besides various consumer durables such as bicycles, radios, refrigerators & the like. The growth pattern of manufacturing activity generally tends, however, to stop short of capital-goods production in most developing countries & even in countries such as Mexico & Venezuela, capital-goods manufacture is still in^{an} early stage of development. This trend has only partially been the result of inadequate demand and consequently limited economic viability for a number of machinery products or for the oft-quoted reason that production skills are lacking in these countries. While both these aspects are of significance, an even more important reason has been the fact of an oligopolistic technology market for a number of products & the restrictive attitude adopted by those possessing the necessary production knowhow and techniques, to manufacture of such equipment in most developing countries. The flow of technology to developing countries in the mechanical & electrical sector has been very slow and inadequate & that too has largely been related to the gradual growth of foreign affiliates & subsidiaries in these countries. It is principally in developing countries such as Brazil & India where a deliberate & concerted policy orientation has been given towards machine-building & the engineering-goods sector in general that a substantial break-through has been able to be achieved.

4. It is necessary to recognise that machine-building enterprises in industrially-advanced countries have looked towards developing countries as a natural market for their machinery products. With a semi-monopolistic situation prevailing in respect of availability of technology for a large number of such products, it was perhaps inevitable that the initial initiative for undertaking the production of mechanical & electrical equipment really rested with foreign groups & companies, operating on a multinational basis. For historical reasons in most developing countries, consumer preference has also been in favour of imported electrical and mechanical equipment. The teething problems in the initial manufacture of such products the high cost of technology paid, in a number of cases, the restrictive conditions of technology transfer besides techno-economic limitations in particular cases, has also resulted in higher product prices & products of obsolete quality in a number of cases, which has further accentuated the problems facing the initial growth of this manufacturing sector in these countries. Consequently, such growth has often been left to the initiative and interest of those foreign groups which have dominant market penetration for specific products in particular countries. Even when the national market in a developing economy is considered to be of economic size and there is indirect pressure to undertake such production indigenously through quantitative import restrictions, there continues to be undue dependence on foreign subsidiaries and affiliates who inevitably adopt an investment and integration programme suited to the corporate requirements and initiative of their parent companies rather than those of the country concerned. The degree of foreign ownership in mechanical and electrical

equipment products consequently tends to be very high in most developing economies, extending from 60 to 90% and most manufacturing units in this sector tend to develop as a foreign subsidiary or affiliate. This has obvious implications in that decisions relating to such subsidiaries are taken at distant headquarters of parent organisations. Such decisions are necessarily part of the global pattern and strategy of the parent multi-national enterprise, which may not coincide with the interests of the subsidiary or of the host country. A number of other difficulties also emerge. Firstly, the pattern of national integration in manufacture usually tends to be unduly slow and gradual and subsidiaries continue to be heavily dependant on their parent companies for, components and parts. In many cases, subsidiaries remain as local assembly units for several years. Secondly, dependance on foreign techniques continues for indefinite periods and even simple technical data has to be obtained from the parent organisation with little indigenous technological development or adaptation. Thirdly, the nature and magnitude of investment, the manufacturing techniques to be applied, the production pattern and rate of expansion & growth are decided by the parent organisation, often with only limited relation to the needs and potential of the subsidiary enterprise. Fourthly, the terms and conditions of technology inflow are oriented to the interests of the parent multinational company rather than that of the subsidiary unit. Experience in recent years, in a number of countries of Asia and Latin America in particular, has shown that if a completely free hand is given to foreign subsidiaries and affiliates,

various shortcomings develop in the growth of this critical manufacturing sector, if viewed from a national angle. The case for regulation of foreign investment and technology, in this sector in particular, stems from the need for ensuring that technology transfer in these vital production branches takes place in an effective and co-ordinated manner, consistent with the techno-economic possibilities and potential of the developing country in question.

5. It has to be recognised, at the same time, that domestic resource inflow into this manufacturing sector is singularly lacking in most developing countries, together with lack of entrepreneurial interest, initiative and capability on the part of the private sector in most such countries. Lack of investible resources and entrepreneurial skills are both inhibiting factors, particularly in so far as the machine building sector is concerned. The growth of public sector enterprises in many developing countries such as India, Egypt and Mexico, to meet this situation has provided a partial solution and has contributed a new dimension in terms of corporate investment. This has necessarily, however, to be accompanied by development of indigenous skills, both at the level of project planning and pre-investment analysis and in respect of efficient project implementation and management. The growth of competent indigenous consultancy services and of national technological skills is an essential adjunct to the development of indigenous entrepreneurship, both in the public and private sectors. Opportunity and pre-investment studies covering initial techno-economic parameters must provide the base

for the development of national entrepreneurship, particularly in the manufacture of equipment of various categories. These have to be supplemented by the growth of indigenous technological services in respect of designs, basic and detailed engineering, construction supervision and management techniques. The broad package of national technological growth has necessarily to take these factors into full account.

6. The role of foreign investment has to be determined in the context of each developing country and is of particular significance in so far as the manufacture of mechanical and electrical equipment is concerned. In cases where a sizable resource gap has to be covered, including items such as foreign exchange costs of machinery or components, the question of such investment assumes a different dimension. Even, however, where there is no major resource gap as such, it may still be desirable to encourage a degree of foreign investment participation in this particular sector for a number of reasons. Firstly, the nature of technology usually tends to be very complex and involves continuing in-flow of technological knowhow and information over a period of time. Secondly, the absorption of technology in machine-building manufacture is a relatively slow process and may require a considerable degree of 'hard-holding' by technology suppliers in initial years. Thirdly, apart from the manufacturing technology, various technological services may be required from technology suppliers by way of plant engineering, training of personnel and technical management operations in the initial years which can often be supplied only through foreign partners. At the same time, no hard and first rule can be laid down that foreign investment participation is

invariably desirable in all such cases. There are a number of instances in developing countries where complex durable consumer goods and machinery items are being manufactured through purely national enterprises. The fact of foreign participation often leads to undue dependence on the foreign partner for all aspects of technology and know-how and constitutes a corresponding disincentive for the growth of indigenous technology and adaptation. It is necessary to stress that foreign investment participation inevitably involves a long term out-go of resources by way of dividends and earnings. This becomes increasingly accentuated in respect of products where a large national market is controlled through a manufacturing unit which is insulated from foreign competition through a system of import controls and quantitative import restrictions. In such cases, where a national market is reasonably assured and protected, foreign capital investment in the manufacture of mechanical and electrical equipment should be directly related to the period required for absorption and adaptation of imported technology. If, for this purpose, minority foreign capital participation is necessary, this should be accepted but if the purpose can be served by a purely licensing arrangement, foreign capital participation should not be encouraged as a matter of course. It is in respect of capital-goods products in this sector that the need for foreign capital participation may become increasingly pertinent. National markets in most developing countries are not of such size as would enable internationally competitive manufacture without a sizable proportion of production being exported. Where sizable exports are essential for viability, the need for foreign partners

becomes much greater, not only to ensure quality production but to assist in foreign marketing and sales. Here also, however, no specific guidelines can be defined and the nature and extent of foreign participation really necessary would differ from case to case. By and large, however, it is important that ownership control should rest with national entrepreneurs and agencies over a period of time and foreign capital participation should be confined to minority participation in the long run. In many developing countries, majority foreign ownership is permitted only in very special cases. In some countries, majority ownership is permitted only for a certain number of years, within which the foreign partner is required to convert into a minority holding. The pattern differs from country to country and in the context of the product mix in each case. What is important, however, is to ensure a national approach to this question so that whatever decision is taken regarding the extent of foreign capital participation is determined in the context of overall requirements of a particular project in a specific national economic setting.

7. Transfer of technology in respect of mechanical and electrical equipment production is largely conducted at present through the mechanism of technology licensing. With greater technological sophistication in the manufacture of such products, industrial property rights in the form of patents and trade-marks have become increasingly pronounced and technology licensing has emerged as the most popular and effective tool for transfer of technology. Such licensing arrangements continue to be much greater in number and magnitude between enterprises in industrially-advanced countries and most machine-building plants in these countries have an intricate

system of licensing and cross-licensing for various products and production techniques. These licensing contracts however, take place between manufacturers having considerable specialized experience and the contracts relate primarily to patents and innovations, though production know-how accompanies such patent licences wherever necessary. Since the licence normally relates only to patented items or production techniques, the content of the technology package is confined to these items.

8. The nature of technology transfer and the content of the technology package tends to differ considerably when a licensee from a developing country is involved. Firstly, the scope of technology transfer varies in that, apart from patent user rights, the licensor has to provide technological assistance and knowhow to a more comprehensive extent. The content of the technology package usually extends to the preparation of detailed project and market studies, plant engineering, selection of equipment, training of personnel, supervision of project implementation and technological management operations in the initial years. In a number of cases, turnkey arrangements are still being entered into for the establishment of mechanical and electrical equipment production facilities, though there is increased awareness that such turnkey contracts usually tend to be more expensive and do not often conform fully to the needs and requirement of projects in these countries. Secondly, the nature of technology transfer differs in the case of developing countries because the recipient of technology is usually in a much weaker bargaining position. This is partly because a prospective

licensee from these countries has little experience of the intricacies of technology licensing and the full implications of various contractual provisions. Such licensees are also not usually aware of alternative sources of technology and of the costs of various technological processes and services. They generally tend to approach those foreign manufacturers whose products are already well-known in the national market in question. Such manufacturers are in a strong position to drive a hard bargain not only in terms of cost of technology and various contractual restrictions but also in the nature of the technology itself. Such a situation develops, irrespective of the fact whether foreign capital participation takes place or not. Where there is a degree of such participation, there is of course greater likelihood of technology transfer being full and complete and the nature of technological assistance would also be such as to ensure that adequate absorption of technology takes place. These two aspects are basic to any technology agreement. Unless the technology acquired is fully transferred it serves little purpose. Similarly, it must be fully absorbed in the licensee enterprise if the licence arrangement is to succeed. In respect of these aspects, the responsibility primarily lies with the licensee enterprise. There are certain aspects, however, in the process of transfer of technology particularly in the equipment production sector where the disadvantages faced by a prospective licensee from a developing country can only be offset by governmental assistance. This constitutes the rationale for regulation of technology contracts in these countries. This question has to be viewed against the overall role of governments & governmental institutions in

respect of technology transfer.

9. Governmental agencies in developing countries have necessarily to perform a dual role in the acquisition of technology for the machine-building or equipment-manufacturing sector. On the one hand, governments must play a significant promotional role in ensuring that investible resources & appropriate technology is channelised into this critical sector. On the other hand, it is necessary that technology inflow is regulated in a manner that national interests do not suffer & due protection & support is accorded to prospective licensees from these countries in the course of finalising arrangements for technology acquisition.

10. The promotional role & functions of government covers both the creation of a suitable climate for resource channalisation to this sector & serving as a catalytic factor for the planning and implementation of specific manufacturing projects. Such functions would initially include the listing of projects in this sector which are of particular significance to the economy & the preparation of pre-investment & opportunity studies with a view to interest potential entrepreneurs, both national & foreign as the case may be. At the same time, an integrated policy package has to be drawn up & implemented which should be specifically applicable to this & other priority sectors of investment. As pointed out earlier, unless there is deliberate policy orientation, investments in this sector may either not be adequate or initiative may remain, for the most part, with foreign subsidiaries & affiliates. The production of mechanical and electrical equipment often necessitates large capital investments, long gestation periods & initially low returns on capital in a number of projects. Initial production costs often tend to be high because of lower productivity,

high quality standards are difficult to achieve and market penetration is a slow & gradual process, even in protected domestic markets. These difficulties can only be set off by a policy package of facilities & incentives. The facilities may take the form of financing of techno-economic studies, institutional financial participation, loan assistance, tax benefits, provision of land & infra-structure at subsidised rates, training programmes & the like for setting up manufacturing enterprises, besides import controls, & export subsidies to ensure adequate national & export markets. The package of incentives would necessarily differ for different countries but, by and large, these must be of such magnitude as to bring about resource channalisation to this production sector to the desired extent. The role of the public sector in any particular country would ofcourse have to be determined by overall socio-economic considerations but direct governmental corporate initiative & entrepreneurship may well prove necessary in a number of developing countries if significant investments in this sector are to materialise.

11. The regulatory role in respect of technology acquisition in this sector can be considered under three broad heads viz (i) selection of technology (ii) remuneration for technology & (iii) conditions of the technology contract. In so far as selection of technology & source from which technology is to be obtained, initiative should be with the licensee enterprise but the regulatory agency must ensure that the technology being acquired is consistent with national interest & policies. It would be necessary to consider whether any technology import should be permitted for certain equipment & products which can be indigenously developed in the normal course of development. In India, no import of technology is

permitted for a very large number of products. It would also not be purposive, for example, to acquire highly-sophisticated technology which would involve component imports of 75% or over even after a 10-year period which is not uncommon in a number of assembly units. In certain developing countries, labour-oriented techniques may be preferable to the latest highly capital-intensive technology, though it has to be ensured in such cases that such techniques & the resultant products are not obsolescent & do not result in potential export markets being shut out. Where technology is tied to the transfer of used equipment, usually as part of foreign investment participation, particular caution needs to be exercised.

12. The remuneration for technology is a complex issue & an essential feature of the licensor-licensee arrangement. Lack of information on the part of the prospective licensee regarding availability of alternative techniques & cost of the same or similar technology supplied to other licensees generally proves to be a very great disadvantage. To an extent, well-manned Technical Advisory & National Consultancy Services in developing countries can obtain & provide a great deal of information to prospective licensees. The critical factor which determines the cost of technology is the negotiating capacity & bargaining strength of the licensor & licensee. Certain norms can be prescribed as to whether a lump-sum payment or a running royalty or a combination of both would be less or more suitable for particular machine-building branches but the actual negotiations should be generally left to the licensor & licensee as this is ^{part} a parcel of the relationship that has to be developed between these parties

to the technology contract. A regulatory agency can nevertheless also serve as a point of second check & can ensure correction of technology costs which are obviously unduly high or foreign technological services whose charges are excessive. It must be stressed that, in view of the large extent of international licensing done in this sector, it should be possible to obtain & compare costs of technology & technological services & regulatory agencies can provide considerable assistance in this regard.

13. The contractual provisions in technology agreements which need to be specially watched in the case of equipment industries, apart from the question of remuneration in the form of fees or royalty, are those relating to (i) definition of technology & phasing of technology supply (ii) access to improvements (iii) duration of agreements (iv) grantback provisions (v) territorial restrictions on sales (vi) tie-in clauses relating to purchase of parts, components & spares & (vii) rights to patents, trade marks & trade names. These provisions need to be carefully assessed in the case of all technology agreements⁺ & it is only proposed to highlight the aspects which may be of particular significance in the equipment manufacturing sector.

14. It is necessary to clearly define the technology proposed to be acquired & the detailed stages at which technology in the form of designs, blue prints, manufacturing drawings etc is to be supplied, besides training and other technical services. In the mechanical & electrical equipment sector, the number of machines & models usually tends to be

⁺ For a detailed discussion of these provisions, reference is invited to "Guidelines for acquisition of technology in developing countries, with special reference to licensing, a UNIDO publication (U.N. 1973).

very large & it is necessary to specify clearly as to which machines & models are covered in the technology contract. The phasing of supply of technology is also very important in that the flow of data, information & services should be closely linked to the manufacturing programme of the licensee enterprise. The phasing of production integration is of particular significance in this context & technological information & data should be supplied fully in accordance with the phased programme of integration which the licensee enterprise proposes to implement.

15. It is important to clearly stipulate that the license would include access to improvements introduced by the licensor during the period of the license. This is particularly important in the manufacture of mechanical & electrical equipment & products, because constant improvements are being effected in designs, layout, production techniques & use of alternative materials, parts & components. It is essential that licensees should have full access to such improvements as are introduced in the licensor's manufacturing plant during the period of license.

16. The period of agreement should invariably be adequate for effective absorption of technology. Such absorption takes considerable time in the case of most machine building projects & a period of five years is usually considered to be a reasonable minimum. Generally lump-sum payments should be avoided, except where the technology is simple & can be speedily absorbed without difficulty.

17. Any contractual provision which stipulates that a licensee should furnish all information & data free of cost regarding improvements effected by the licensee during the period of agreement should be avoided. Where such improvements are sought by the licensor, these should be supplied on mutually-agreed terms & conditions or on the same terms as in the technology contract.

18. In most technology agreements, licensors seek to impose territorial restrictions on sales &, generally, sales are sought to be confined to the country in question or to a few neighbouring countries. Such restrictions have serious implications in the case of machine-building enterprises. Most such enterprises must necessarily operate in an international market over a period or time if they are to be really successful and provisions prescribing undue territorial restrictions should be resisted by licensees as far as possible. The regulatory agency can also play a vital role in this regard. In many countries, such as Mexico, Argentina & India, where technology contracts are effectively regulated, the regulatory agency does not permit export restrictions, with the exception of countries where the licensor ^{is} legally bound by other technology-supply contracts.

19. An important contractual provision relates to the supply of sub-assemblies, components and parts. In a number of equipment manufacturing licenses, the licensor's objective is to prolong the supply of components & parts to licensees over as long a period as possible. From the licensee's viewpoint, this has a vital bearing not only on the phasing of manufacturing integration but in the pricing of the final product, as the cost of imported components & parts can prove to be very high, apart from national foreign exchange constraints which can
....

disrupt such inflow. It may be necessary that sub-assemblies & components are imported in the initial years but care has to be exercised that the period is not unduly prolonged & that the cost is not unreasonably high and does not contain a large element of 'transfer pricing.' An useful approach in the matter of pricing of components & parts is to provide in the technology contract that (a) there are no restrictions in the purchase of such parts & components from alternative sources & no tie-in clauses only with the licensor enterprise except where this is considered unavoidably necessary. (b) prices of bought-out components by the licensor are paid for on the same basis, plus handling costs by the licensor & (c) parts & components processed & manufactured by the licensor are supplied at the same or similar price as in the next stage of production in the licensor's plant. The pricing of imported parts & components is a critical issue in so far as the machine-building sector is concerned & regulatory agencies should also ensure that no undesirable tie-in provisions are incorporated in technology-supply contracts.

20. The question of patents, as also trademarks & trade names, poses a major issue in technology transfer to developing countries. The patent system has almost invariably worked to the advantage of patent-holders from industrially-advanced countries, which cover over 90% of all industrial patents. It is difficult to cite even single instances in most developing countries where patents have operated to the advantage of such country or enterprises in the country. The patent system has, over the years, developed into a strong legal instrument, operating almost wholly in the interest of

enterprises in industrially developed nations. A radical review of patent laws is undoubtedly called for if this system is not to prove a strong deterrent to the essential flow of technology at reasonable cost to developing countries. There has been considerable re-thinking on this question in a number of such countries and changes have been made in patent legislation in some countries primarily to ensure that patents taken out in certain sectors are utilised in manufacture within a reasonable period of time. These are, however, isolated cases & what is necessary is concerted and combined action by a number of developing countries in this regard so that international patents do not constitute a stranglehold on the effective transfer of technology to these countries. What is true of patents is also true of trademarks & trade names to a great extent. The preference for foreign trade marks & trade names is already an inhibiting factor for the growth of national enterprises in many of these countries & deliberative government action needs to be taken so that foreign brand names do not play an unduly significant role. A practice adopted in many projects based on foreign investment technological collaboration in India has been to deny permission for the use of the foreign brand name to products sold in the national market. While such a policy may regulate the use of foreign trade names & brands in the case of new projects, it would not be possible to extend such a policy to products manufactured & sold in the country at present, without radical modification of existing trademarks legislation. The time has, however, come when a basic departure from present legislation & attitudes is necessary in respect of

industrial property rights as such.

21. In so far as technology acquisition in individual cases is concerned, contractual provisions relating to use of patents & trade marks need to be carefully assessed. All patent user rights which need to be covered should be specified, while payments should not be made for patents which do not come within the scope of the contract. Provision should also be made for jointly dealing with possible infringement of third party patents. In respect of trade marks, it may be necessary to associate the name of the foreign licensor in the initial years covered by the licence but it would also be desirable for a local name to be associated with the product, so that with the termination of the license arrangement, product sales could continue in the local name.

22. A number of other contractual provisions in technology agreements need to be negotiated with care. These can relate to the details of technological services to be provided by the licensee, the phasing of integration, the details of manufacturing drawings & other documentation, the specifications (metric or other measures) to be used, including that of machinery, components & spares to be supplied by the licensor & clauses relating to language, governing law, termination, arbitration etc. An important provision in the case of equipment manufacture relates to the guarantee or warranty as regards the quality of technology supplied. This is easier to define & assess in a process industry where it can be related to specific outputs to be achieved from a particular technology. Equipment manufacture has to be related to products of particular design, specification & quality which, in turn, are dependant on production skills, quality of parts & components used & other

factors not directly related to the production technology as such. An acceptable contractual provision may be to stipulate that the technology supplied must be full & complete as compared to the technology & production processes used in the manufacturing plant of the licensor.

23. It needs to be stressed that technology licensing depends essentially on a satisfactory licensor-licensee relationship, particularly in the equipment-production sector where close & continuing collaboration is usually necessary for several years. However, carefully a technology contract is negotiated & drafted, effective technology transfer would not take place in the absence of such a relationship & without goodwill on the part of the licensor, particularly in this sector. It is important in this context that the responsibility of negotiations with the licensor should be largely left to the licensee with the role of the regulatory agency being primarily to ensure that the technology contract is in the national interest in terms of need & appropriateness of the technology & reasonable cost &, at the same time, no restrictive provisions are incorporated which would inhibit the full utilisation of the technology & its effective absorption & adaptation by the licensee enterprise.

24. The need for a regulatory body to regulate technology contracts in developing countries or in groups of such countries cannot be over-emphasised. While foreign investment is generally subjected to governmental scrutiny, it is considered in some developing countries that technology inflow should be unrestricted. Over a period of time, however, the costs of technology inflow become very substantial & all the more so, when licensee enterprises in ^acountry are not aware of the full implications of technology-supply arrangements. During the 50s' & 60s', Japan was the major importer of technology

in/number of sectors, including equipment manufacture but not only were Japanese enterprises generally very knowledgeable about technology contracting, but all contracts above a certain figure were subjected to scrutiny by the government. In most other countries, including Mexico where technology agreements are being screened by the Registry of Technology since the last 3 years, the creation of such an institution has not led to a stoppage in the inflow of technology. In most such countries, where such regulatory institutions are set up the level of technology inflow continues as before, after a brief period of adjustment to new regulatory procedures.


25. It needs to be emphasised that regulation of technology contracts is by no means confined to developing countries. In fact, in most industrially-advanced countries, including the USA, Japan & the EEC countries, fairly comprehensive legislation & policy is being implemented to present restrictive trade practices, most of which have been extended through technology-supply arrangements. It is unfortunate that technology suppliers seek to impose on licensees in developing countries a number of contractual obligations which would not be legal in their own countries. This further supports the need for regulation & screening of foreign technology supply arrangements in the less developed economies.

26. It is important that regulatory control in respect of foreign technology inflow retains a considerable degree of flexibility. Conditions of the technology market change from time to time. Similarly, with successive stages

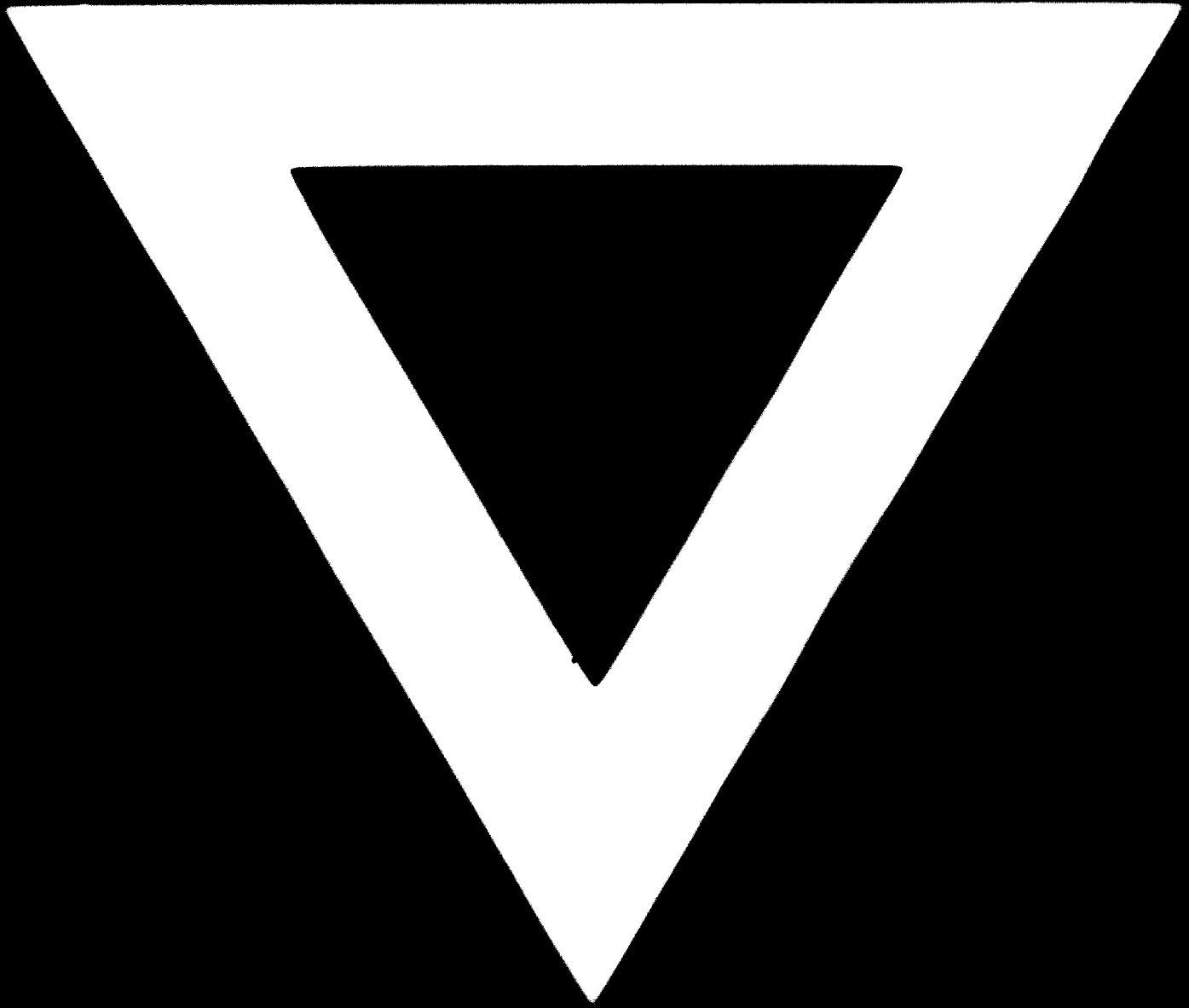
of industrialisation, the requirements of various branches of technology & technical services are also bound to change in every country. The regulatory system must be responsive to such changes and must adjust itself rapidly to fast-changing situations, resulting from national growth in various industrial sectors and in the local availability of various technological services such as design preparation, detailed engineering, construction and erection and other consultancy services.

27. It is also imperative that regulation of foreign investment and foreign technology inflow should not be considered in isolation but must be conceived as part of an overall industrial strategy in developing countries. Such regulation must be considered in close conjunction with national policies relating to facilities and incentives for industrial expansion; defining of priority sectors of manufacture such as equipment production; import controls and protection measures; export incentives and policies and the like, all of which should necessarily be dovetailed into one comprehensive and integrated policy package.

28. The inflow of technology to developing countries is undoubtedly a basis requirement for effective industrial growth in these countries and such technology inflow in the manufacture of mechanical and industrial equipment is particularly necessary. At the same time, such inflow needs to be effectively regulated in a manner as to ensure that genuine needs and aspirations in these countries are adequately and appropriately served.



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