Chapter II

PATTERN OF TECHNOLOGY TRANSFER

The developed countries have been continuously shifting their modes of domination over the underdeveloped ones in response to changing conditions. They have moved away from control of raw materials to the control of finance and at present their economies are stressing on the control of technology. The developed countries took a lead in developing science and technology ever since the industrial revolution. The developing countries started this process much later and are finding that despite their efforts, the gulf between the two sets of countries is widening and deepening. Technology is regarded as a major instrument through which new patterns of dominance over the periphery are maintained. The developed and developing countries' nexus is one of centre-periphery relations or North-South relations.

The asymmetries in the relationship between the centre and periphery can be summarised as follows: (a) in commodity pattern - the types of consumer goods produced in poor countries are strongly influenced by those consumed in the rich countries; (b) in means of production - the ability of poor countries is very limited; (c) in technical knowledge - there are gaps concerning both communications and information; (d) in skills - there are many more
opportunities in the advanced countries for learning by doing as compared to developing countries; (e) **in trade** — there are often restrictions on exports from developing countries that use imported technology in their manufacture; (f) **in finance** — most developing countries have limited and uncertain access to capital; and (g) **in control** — the main decisions are generally taken in the developed countries.¹ The developing countries lack in various degrees the information and negotiating capacity to secure fair and equitable terms when importing technology.

**Technology Gap between the Developed and Developing Countries**

The construction of viable framework for the technological transformation of the developing countries should begin with a proper understanding of the technological gap among countries. In the overall equation between the developed and developing countries, the latter are mostly buyers in the international market for technology. They are also dependent for technical knowledge on the former. The intellectual property system (governing patents, trade marks and copy rights) strengthens the position of the technology holders of the developed countries by granting them monopolistic rights in the markets of the developing countries.¹

countries. "About ninety-four per cent of the patents are held by individuals and organizations of developed countries. And even out of the remaining six per cent, eighty-four per cent are held by foreigners, often for purposes of preventing the use of local competition." Only two per cent of world's scientific research is carried out in the developing world and only one per cent of world patents (3.5 million) are held by it. The position of the developing countries in the international technology market is much influenced by the lack of specialized technical skills and in turn "the availability of foreign technology affects the role and pattern of growth of domestic technological skills, especially in the creation of new techniques".

The developed countries are centres of advanced technology while the developing countries are technologically backward and dependent on the developed world. Almost all


advanced technology originates in the industrial countries and most of it continues to be developed by them. The allocation of resources to Research and Development in advanced countries has been growing at an exponential rate. Today, sophisticated technology is heavily concentrated in the developed advanced countries. The world's massive scientific and technological capacity is concentrated in a few highly industrialized countries which are responsible for well over ninety per cent of total Research and Development.6

It has been estimated by the Sussex Group that "ninety eight per cent of the world's expenditure on Research and Development were made by the developed countries while the developing countries accounted only two per cent of the global expenditure on technological innovation".7 More recent estimates put these figures at ninety six per cent by the developed countries and four per cent by the developing countries and at present ninety five per cent and five per cent respectively.8

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The developed countries are richer, and enjoy a dominant position in the global economy, than the developing countries. They conduct a large share of world investment and world trade in manufactures. "Over 90 per cent of the world's manufacturing industry is in the developed world". The developing countries are producers of raw materials and primary commodities. In fact 90 per cent of the exports of the developing countries are accounted by these products. They rely heavily on the export earnings from the sale of primary products to the developed countries. And if this share of commodities declines, the entire trade of the developing countries becomes stagnant.

The technological inequalities between developed and developing countries are shown in Table I. This table shows the developing countries have a nominal share in R and D expenditure and their R and D scientists and engineers constitute 1/8 share of the world total. Moreover, their share in exports of engineering and transport equipment is very small while their imports of

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10 The major share of the developing countries is on eight to ten primary commodities and raw materials (tin, coffee, sugar, tea, bauxite, tungsten, copper, iron-ore, lead, etc.). For details, see P.G. Salvi, The Emerging Developing Countries (New Delhi, Intellectual Publishing House, 1982), p. 2.
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Developed market economy</th>
<th>Eastern Europe including USSR</th>
<th>Developing Countries</th>
<th>Source: UNIDO, <em>Industry 2000: New Perspectives</em> (I/D, 237), Tables 7(1) - 7(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. R &amp; D Scientists and Engineers, 1973</td>
<td>55.4</td>
<td>32.6</td>
<td>12.6</td>
<td></td>
</tr>
<tr>
<td>2. R &amp; D Expenditures, 1973</td>
<td>66.5</td>
<td>30.6</td>
<td>2.89</td>
<td></td>
</tr>
<tr>
<td>3. Share of exports of machinery and transport equipment, 1976</td>
<td>86.9</td>
<td>9.5</td>
<td>3.32</td>
<td></td>
</tr>
<tr>
<td>4. Developing country, imports of machinery and transport equipment</td>
<td>90.3</td>
<td>4.2</td>
<td>5.1</td>
<td></td>
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</table>
the same are very high. It also reveals that the disparities between the industrialized countries and the developing countries are crucial in the field of technological development; the dependence is almost total. Developing countries possess only 12.6 per cent of global stock of scientists and engineers engaged in R and D of which 9.4 per cent are concentrated in few countries of Asia.

Developing countries account for 2.89 per cent of global expenditures on R and D and 3.32 per cent of global exports of machinery and transport equipment. Approximately 95 per cent of developing countries' imports of machinery and equipment came from the developed countries.

**Position of Developing Countries in International Technology Market**

The developing countries are incapable of creating and satisfying their technological needs and even incapable of selecting and absorbing the most suitable technology from the limited range available.\(^\text{11}\) The absolute level of R and D efforts in the developed countries is larger than that of the developing countries. The developing countries have low scientific and technological capacity in view of the explosive conditions of population growth.

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unemployment and underdevelopment. They are handicapped because they do not know how to locate alternate sources of technology as there is a serious information gap. In some cases, the lack of basic alternatives and the ignorance of the buyer has led to the wastage of scarce resources, particularly capital. Heavy investments have too often been made in plants and capacities vastly exceeding the size of markets. In some cases, governments in the developing countries have encouraged the proliferation of oversize plants for the sake of achieving competition with the net result of higher cost, inefficiency and wastage or neglect of resources. The developing countries are plagued by the scarcity of capital, entrepreneurship, management expertise and technical personnel. In addition to it, they are faced with the problem of brain-drain as "the local scientific and technological community alienated from their own environment as they can retain their identity only by orienting themselves outwards".  

Much of the existing stock of scientific and technological knowledge is suited to the needs and conditions

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12 Generally, scientists and researchers contribute to the advancement of science as an international undertaking by choosing a research topic of international relevance rather than local relevance and thereby disregard scientific needs of the country. Bernard I. Logan, "The Reverse Technology Transfer from Sub-Saharan Africa to the USA", The Journal of Modern African Studies (Cambridge University Press), vol. 25, no. 4, December 1986, p. 600.
prevailing in the developed countries which have little in common with those of the developing world. Little pressure has been exerted on local scientific community to provide a viable technological alternative, particularly in manufacturing industries.

Apart from this, the nature and ways through which technology is transferred have created a situation which benefits the developed countries. The developed countries are able to take advantage of a wide range of weaknesses of the recipient country. Rather than reducing the technological dependence of the developing countries, the present system of technology transfer actively and persistently reinforces it. It leads to foreign investment, loss of control and introduction of alien patterns of consumption and production. This creates an enclave of economic dependence on the advanced countries for inputs, markets, management, finance and technology. It may facilitate the expansion of industrial input in the developing countries. However, it does not necessarily further the ability of these countries to produce that output or more precisely does not give them the capacity to adapt and modify existing technology or to evolve new technology. Rather it leads to a vicious circle in which weak technology system reinforces dependence and this dependence perpetuates weakness.
CHART I

The Vicious Circle of Technological Dependence

Weak S and T, Indigenous Capacity

More Foreign Inputs

Reliance on Foreign Inputs

Ineffective Development of Indigenous S and T

Further Marginalisation of Indigenous S and T

Low Demand for Indigenous S and T services

Increased Dependence on Foreign Inputs

The above Chart shows that the recipient developing countries have been depending on the technology supplied by the developed countries. They have also been in continuous trap of the technological lust shown by the supplier developed countries.

Source: The Structure and Functioning of Technology System in Developing Countries (ID/WG.3/14) p. 43
Some of the elements of this vicious circle are shown schematically in the Chart I. The Chart shows that the need to import technology leads to foreign investment, loss of control and the introduction of advanced patterns of consumption and production. The situation is self-reinforcing because once advanced technology has been introduced, it creates a society of its own image, requiring further import of technology to feed the markets which have been created. The consequence is weak local scientific and technological base and technological dependence. This technical dependence means that advanced countries' interests are internationalised, inhibiting independent action to counter technological dependence.¹³

Present Pattern of Technology Transfer: MNCs of the North

There is a growing appreciation of importance of technology in influencing the conditions of human existence not only in the affluent developed world but also equally in poor developing countries. While global interdependence is receiving increasing attention in the developed countries, self-reliant development is becoming a major concern in the developing countries.

Most of the developing countries are confronted with social and economic problems including poverty, hunger, malnutrition, illiteracy, population explosion, inflation, environment pollution and energy issues. They have fragmented economies and limited adjustment capabilities. There is a feeling that a substantial improvement in the relative economic standard of the poor countries cannot be achieved without transfer of technical know-how which constitutes, perhaps, the most fundamental source of wealth in the developed countries. However, technological advancement has become a synonym for such countries. The developing countries consider technology as the most important instrument for building up economic infrastructure. They also think transfer of technology as the ideal way of creating independent development capacity. 14

In the absence of industrial base, the developing countries have to depend heavily on the developed countries in terms of both financial and technical assistance. Most of them never had the opportunity to participate in the innovation and development of modern technology, hence were deprived. Having missed industrial revolution, their endeavour is to make concerted efforts to make up for the lost time by trying to compress within few years

what the developed countries took decades to achieve. Consequently, they have relied on importing expensive technology on turnkey basis, with a view to achieve self-reliance in technological field. The present pattern of technology transfer is one way process from developed to developing countries and interrelated with the pattern of international trade and investment. It is donor or supplier oriented. The techniques of production are often capital and energy intensive and require sophisticated managerial skills. Multinational Corporations (MNCs) are the main source of technology in the developing countries. At present there are more than 20,000 MNCs in the world and the most powerful MNCs are those of the USA. 

Control of Technology

The majority of technology is the monopoly of private sector in the developed countries. The private enterprises which grew as a result of industrial revolution have consolidated their position by acquiring new markets and sources of raw material under the auspices of the Western-imperial system. With the introduction of new technologies in the Western capitalist nations, the need for bigger finances, large markets and larger sources of raw materials became imperative both for maintenance and growth of the

industrial complex. The smaller firms were unable to utilize the benefits of new research (due to its high costs) because of their weak financial position. Hence, they had to merge with big firms. These big firms became multinational firms or corporations. Thus MNCs are the inevitable product of capitalist process.

The MNCs are among the world's largest firms and engage in a variety of international activities and operate plants in a number of countries with different political, economic and cultural environments. "They have substantial financial commitments overseas and derive considerable growing profits from this business. They have a global perspective on investment, marketing and other opportunities".  

16 They have the opportunities that the local firms lack. The rise of MNCs made technology a privilege and monopoly of a few. This prevented technology from percolating to others. Patents, trade marks, licensing and industrial property laws increase the monopolization of MNCs and strengthen the technological dependence of the developing countries.  

17 MNCs are those economic enterprises that are headquartered in one country and that

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pursue business activities in one or more foreign countries. \(^\text{18}\) They are supported to bring in to developing countries the missing or deficit factors of production i.e. capital, technology and managerial skills. \(^\text{19}\)

The terms multinational and transnational are used interchangeably as both are dominant institutions of the global system \(^\text{20}\) and brought about by world-wide expansion of 'techno-industrial oligopoly capitalism'. \(^\text{21}\) Both play an essential role in disseminating and diffusing technological knowledge world-wide. A large percentage of their technology sales consists of internal trade between parent companies and foreign subsidiaries because of their general unwillingness to license to third parties. So

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20 There was confusion over the terminology of MNCs. Before 1974, the term 'transnational' was being distinguished to MNCs and the use of term depended upon the number of nations over which management is spread. The establishment of UN centre on transnational corporations as well as UN Commission on transnational corporation in mid 1970s has stimulated the interchangeable use of terms multinational and transnational. See for details J. Dixon, D. Dsakakis Smith and H.D. Watts (ed.), *Multinational Corporation and Third World* (London, Croom Helm, 1986), p. 2.

21 Techno-industrial structure refers to the close structural relationship between scientific and applied research development; and mass consumption and marketing.
the difference between Transnational Corporations (TNCs) and Multinational Corporations (MNCs)\textsuperscript{22} hardly matters here, as the purpose of both is almost the same. Both operate in more than one country and take over the national firms of other countries thereby converting them into subsidiaries. They are integrated across national frontiers either horizontally, vertically or both.

The MNC is probably the most visible vehicle for internationalization of the world economic system. As the economies of different nations have become increasingly linked and functionally integrated, the MNCs seem to have been the institution most able to adapt to a transnational style of operation. They are prime stimulus for transnational interactions and relationships.\textsuperscript{23}

The MNCs are comparatively a recent phenomenon in the world of business and industry. They already existed in the eighteenth century. What is new about them is their

\textsuperscript{22} The difference between the two is on restrictions which they impose. TNCs put territorial restraints while MNCs act at global level. TNCs had transferred technologies to the purchase of goods and services while MNCs had purchases of inputs and put restrictions on imports. TNCs put restrictions on services and development and also on adaptation or innovation of technology, while MNCs restrict competition in domestic markets and limit dynamic effects of transfers. See for details, D.J. Dixon, D. Dsakakis Smith and H.D. Watts, (eds.), n. 20, p. 35.

\textsuperscript{23} David A. Blake and Robert S. Walters, n. 18, p. 76.
gigantic size, strong financial backing, monopolization of technology, and new management system evolved to manage the sprawling organisation. They have dominant nationality i.e. of a parent company, regardless of the nationality of affiliates, business or junior partner. They have played a prominent role in the internationalization of production and in the growing trade and financial independence of the world economy.

Economic activities throughout the world spurred by technological advance have given impetus to the structure of companies whose large scale operations across every national and political boundaries of nation states considered a threat to these states. The modern MNC, accordingly, is based on more than just trading. It tries to optimise its international production and marketing and often do so by the use of trade marks and patents.

Today, the MNCs have inherent advantage in technology transfer. They are in fact, major agents of efficient technology transfer. Being the owner of technology, they prefer to transfer that knowledge which is related to a unit. They are the focus of decision-making with respect to what to produce, by whom, how and for whom in the world market. They are the main source of technology to the

developing countries. MNCs are major producers of advanced industrial products and among the most "important conduits for transfer of modern technologies from abroad". They bring highly developed product differentiation techniques, sophisticated management system and financial practices and advanced methods of quality control, product development and process engineering, apart from initial provision of complex technology. Chart II indicates concisely the principal features of technology transfer by the MNCs.

The monopolistic strength of the MNCs emanates from the patents, protection for differentiated products and processes. They also gain strength from the weak bargaining power of the recipient developing countries who have no access to information about alternative technology. The terms and conditions of technology transfers are generally governed by the business motives of the suppliers of technology rather than by the development considerations of the importing country. The establishment of a fully owned company or with equity participation by foreign company, lead to the stranglehold of the multinational corporations. MNCs are criticised for introducing a

26 Ibid., p. 83.
Chart II

Features of MNCs Technology Transfer

- Technological Monopoly of MNCs
  - Centralization of R and D
  - Concentration or monopoly of innovation
- High Cost of Technology
- Technical Dependence and Economic Control
- Absence of Training Effect
  - Little use of intermediate technology
  - Creation of pockets of technology
  - Restrictive Practices
  - Restrictions on use
  - Obligatory purchase of suppliers
  - Restrictions on commercialization and reexport
- Inadequacy of transferred technologies
- Lack of appropriate technologies
  - Capital Intensive Techniques
  - Technological Priorities dictated by the Supplier
aggressively marketing products that are not necessary for the "primary tasks involved in modernization and development. Such efforts draw money away from social, health and educational necessities only to contribute it to the coffers of MNCs". The developing countries being technologically backward and underdeveloped get a poor deal in international technology transactions. For instance, a country like India (where coal is available in relative abundance) purchase petroleum-based technology not precisely because it required it but because it is offered by the donor country. There are many other problems associated with the import of technology from developed countries, which are as follows:

1. The imported technologies are not suitable for developing countries and excessive efforts are required to make them adaptable to the indigenously available raw materials and technical skills.

2. Most developing countries lack adequate mechanisms for absorption, indigenization and development of imported technologies which in the absence of

27 David H. Blake and Robert S. Walters, n. 18, pp. 96-97.

a coherent policy, results in repeated imports of the same technology from different countries and sometimes from different sources of the same country.

3. Owing to a protected economy, the importer does not establish in house Research and Development to absorb & update the imported technology.

4. Generally there are many restrictive clauses in the collaboration agreements which tie-up purchases of raw materials and impose restrictions on exports or access to future innovations relating to know-how.

MNCs have been an important producer of new technology. They are responsible for a large share of the world's technological innovation. They try to keep innovative side of their business as close to home as possible. They have been first to introduce various new products and processes to the commercial market. The ability to produce new products is one of the most important sources of MNCs profits. They generally undertake Research and Development activities in the home country. This might apply to technological innovation though perhaps to a lesser extent. The MNCs do conduct research in the

developing countries but their efforts are directed at encouraging subordinate research like data collection and assembly of plants. Their objective is always to transfer only peripheral or subordinate technology.

Most of the technologies supplied by MNCs are obsolete, capital intensive and import-oriented. The inducement of sophisticated technology has been completely unsuitable to the needs of the developing countries. Process and equipments are rarely developed for the specific environment of the developing countries. Once the developing country starts getting foreign technology from MNCs, it is most likely to get into vicious technology trap.

The MNCs act as agents of technological dependence of host developing countries. They are not prepared to transfer the basic process of manufacturing. Rarely new technology is permitted to flow either free of charge or even on payment. The MNCs usually supply old and second hand or even used equipment and mechanism to the developing countries. Their chief objective is to exploit the present system of legal rights in such a way as to foil any attempt at international control of use of patents. 30 They export only that kind of know-how which helps them to integrate the developing countries in their global trade and create market for themselves. In many cases,

the MNCs transfer technology for the manufacture of processes that are banned in the advanced capitalist countries such as certain pharmaceutical pesticides and chemicals.

MNCs generally charge high price for the technology which they supply to the developing countries. A form of technology transfer that has recently developed is the licencing of patents and processes on a royalty basis. They use patents and licenses as tools for making huge profits from the developing countries. Patents and licenses for new types of technology may ensure huge profits for international monopolies for ten years or longer, but that largely restraint the introduction of that technology in developing countries. 31

The MNCs create a demand for their products in the developing countries by exposing a multinational culture (through advertisement, propaganda science and technology conferences). Consequently, most of the developing countries purchase what is available, i.e. what MNCs offer to sell, not what the newly independent countries need for their development. The MNCs normally promote a technology which looks after needs of a small section of society. Generally mass consumption goods are ignored in favour

of the consumption of demands of the elite. The MNCs concentrate on consumption rather than production oriented technology in the developing countries.32

Furthermore, the commercial firms in the developing countries do not exploit local technology and skill and depend mainly on the import of foreign technology. Even, the local enterpreneurs consider that locally developed technologies are more risky than tested innovations that foreign company can offer. They also consider that local design engineers are less efficient and less knowledgeable than the design engineers working in foreign companies. In this process, the developing countries are likely to lose their economic independence and sovereignty. In Stephen Hymer's view, "the MNC is a medium by which laws, politics, foreign policy and culture of one country intrude into another".33

MNCs may impose restrictions upon its foreign officials in order to strengthen its centralized control and maximise global profits. They impose restrictions on the recipient of technology such as (i) purchase of inputs, (ii) restrictions on imports, (iii) requirement of certain guarantees, (iv) restrictions on competition in the domestic

33 Robert Cohen and Jeffry Frieden, n. 19, p. 163.
market, and (v) constraints limiting dynamic effects of transfer. 34

MNCs are the main agents in commercialising technology. Wherever they go their main concern is not the development of the region into a self-sufficient entity but to earn enormous profits. They make the region dependent on them for future technology as well. They prefer to exploit their product advantage by exporting rather than transferring the latest technologies. MNCs operation in the developing world simply reflect a new form of old exploitative business firms with profit making as their major motive. They have developed technologies to produce synthetics which compete with the corresponding resources of the developing countries. Dos Santos argues that since foreign firms control the most dynamic sectors of the economy, the host nation loses many profits earned locally. 35

The MNCs, as a strategy, first pass on the new technology to their firms located in the countries where their parent companies are based. Monopoly on certain types of technology enables the MNCs to fix unimaginable export prices of newly-introduced types of technology.

34 Mahinder Kumar Saini, Politics of Multinationals: A Pattern of Neo-Colonialism (Delhi, 1981), p. 140.
35 Ibid.
For instance, when International Business Machine (IBM) personal computers first came into being, they cost almost three times their current price. After skimming the cream the MNCs transfer that production technology to their factories in other advanced capitalist states, and only after that, they transfer that technology to their concerns in the developing countries. After a certain type of technology ceases to bring in high profits, they sell licenses to companies of developing countries under technological cooperation agreements. Their increasingly active operations in the developing economies make these economies even more dependent on the import of machinery and equipment. For instance, the share of machinery and equipment in the overall imports of Singapore and Malaysia has more than doubled between 1965 and 1982. So the MNCs strategy concerning technology related issues is to minimize technology transfers and to increase the dependence of the developing countries on the import of modern machinery and equipment.

The developing countries' dependence on MNCs manifests itself both in selling raw materials and buying plant, machinery equipment and technology. The MNCs represent a subtle form of economic domination and a neo-colonialism.

36 Kharbalatov, n. 31, p. 152.
37 Ibid., p. 154.
They pay the lowest possible rates for agricultural products and raw materials (which are exportable items in the developing countries) and charge highest possible prices for their industrial manufactured goods and machinery (which are import items in the developing countries). Thus the transfer of technology through MNCs is inadequate to stimulate development. As M. Volkov rightly points out:

"By buying equipment and technology, the newly independent countries strive to speed up the development of their industry and thus overcome the economic backwardness and reduce their dependence upon the industrial countries, while the advanced countries seek ways to use the requirements of developing countries in equipment and technical documentation as new channels of exploitation of the developing countries and for attaching them to the world capitalist market." (38)

The MNCs' monopoly of various products, enables them to fix high prices. It affects the structure of developing nations' domestic markets by creating problems for small and medium-size local companies. Further it promotes economic monopolisation. The central strategy of MNCs is irrespective of the country where technology is being transferred or dumped, to ensure stability, expansion and high profits for the developed country enterprises. Very often technology is not transferred

at all. Technological capabilities are not developed and foreign capital displaces local industry, thereby increasing strain on balance of payments. The resulting situation is an ever-widening economic gap between the developed and developing countries. Barnett and Muller summarised the negative impact of MNCs as follows:

"Global companies have used their great levers of power - finance, capital, technology, organizational skills and mass communication - to create a Global Shopping Centre in which the hungry of the world are invited to buy expensive snacks and a Global Factory in which there are fewer and fewer jobs. The dictates of profit and the dictates of survival are in clear conflict." (39)

Thus, MNCs activities in many parts of the world have begun to be viewed with considerable alarm and hostility. The developing countries find difficulties in controlling the powerful MNCs and adjust their policies to accommodate accordingly. Critics point out that the global strategies of MNCs are invariably in conflict with the national goals of the developing countries. The MNCs do not bother much about the legislation of the countries where they operate. They also intervene directly or indirectly in the internal affairs of the host country. MNCs refuse to accept, covertly and overtly, the exclusive jurisdiction of the domestic laws of the host country.

Conflict between the MNCs and the host government may derive from four sources: (1) from the fact that it is 'private' and hence it may clash with social and national goals; (2) it is large and oligopolistic and hence possesses market and bargaining power which may be used against the interest of the host country; (3) it is foreign and hence may be serving the national interest of parent nation; and (4) it is Western and hence may transfer inappropriate know-how, technology or management practices or products designed with characteristics not suitable to less developed countries. 40

A schematic presentation will make it understand where and how do the MNCs clash with the interests and consequently with the sovereignty of the host developing countries. (Chart II).

According to Raymond Vernon and Dunning analysis, MNCs generate costs as well as benefits to the parent country and to the host country in the form of repatriated profits, linked export orders and competitive advantage in world markets and costs have to be incurred in terms of outflow of funds, transfer of production and consequent loss of potential employment. To the host country MNCs provide a package of new products, technology, capital and management skills which contribute to national economic

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<table>
<thead>
<tr>
<th>S.No.</th>
<th>Objectives of the MNCs</th>
<th>S.No.</th>
<th>Objectives of the host developing countries</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>What, where and with what inputs to produce to maximise profits.</td>
<td>1.</td>
<td>What and with what inputs to produce within the country to maximise growth and social justice.</td>
</tr>
<tr>
<td>2.</td>
<td>Where and on what scale R and D to be undertaken to observe the above objectives.</td>
<td>2.</td>
<td>Within the country with permissible resources R and D to be undertaken to serve the objectives.</td>
</tr>
<tr>
<td>3.</td>
<td>The inter-subsidiary movement of goods and services and their pricing</td>
<td>3.</td>
<td>The inter-regional movements of goods and services at national price levels.</td>
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<tr>
<td>4.</td>
<td>To achieve higher productivity.</td>
<td>4.</td>
<td>To achieve higher employment.</td>
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<tr>
<td>5.</td>
<td>To strengthen MNC.</td>
<td>5.</td>
<td>To strengthen national economy.</td>
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<tr>
<td>7.</td>
<td>To achieve international integration, i.e. domination</td>
<td>7.</td>
<td>To achieve national self-sufficiency.</td>
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<tr>
<td>8.</td>
<td>To maximise sale through unbalanced growth.</td>
<td>8.</td>
<td>To maximise balanced growth.</td>
</tr>
<tr>
<td>9.</td>
<td>To meet military needs.</td>
<td>9.</td>
<td>To combine development with defence needs.</td>
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welfare, but they undermine the growth of domestic industries and pursue certain productive activities which are contrary to the national interests.\textsuperscript{41} Thereby, MNCs carry on neo-colonial exploitation over the developing country. They are the most visible manifestation of the limits of a national economy imposed by the global political economy.\textsuperscript{42}

The MNCs are the most active agents in the global economic system. The advocates of MNCs claim that they have had and will continue to have beneficial impact. They can play a key role in fostering small and medium-sized industries in the developing countries. They are the source of technical and manufacturing information for finished goods. They bring modern management and financial techniques as well as marketing know-how to their affiliates. By adapting to local market conditions, they can encourage indigenous technology development.\textsuperscript{43}

The potential long-range contributions of MNCs to the development of local self-sustaining industrial capability of developing countries can only be realized, only if policies are carefully adopted by the recipient countries and


\textsuperscript{42} David H. Blake and Robert S. Walters, n. 18, p. 125.

\textsuperscript{43} P.N. Agarwala, \textit{The Role and Impact of Multinationals} (New Delhi, Allied, 1990), p. 350.
the local absorptive capacity is adequate.\textsuperscript{44}

**Reality of Technology Transfer**

It is generally argued that no transfer of technology takes place from the developed to the developing countries as the technology is not randomly and freely transferred to them. The industrially advanced countries usually provide peripheral, obsolete, old and surplus technologies to the developing countries that too with lots of restrictions and conditions. For instance "once a patent is located in a developing country, it is generally believed that transfer of technology has taken place. But in many cases, location is solely based on the fact that a country possesses a particular resource endowment. The basic elements of the technology connected with the operation of plant are not transferred at all to nationals of the country concerned. Hence in reality no transfer of technology takes place".\textsuperscript{45}

An American economist Daniel A. Offlong points out that "the multinationals do not make any meaningful transfer to the societies of the developing countries. Rather, technological dependence is a great obstacle to their


\textsuperscript{45} Surendra J. Patel, "Technological dependence of the Developing Countries", *Mainstream* (Delhi), Republic Day, 1975, p. 33.
development. An inevitable factor in the process of development is for a society involved to be able to develop the right kind of technology for its local needs. But when technology is controlled from abroad, the final need for research and development goes to the metropolitan firm to develop its technology still further and this technology is designed for global profit maximisation, not the development of the underdeveloped countries." 46

The mechanism of profit maximisation is entirely determined and put into operation in accordance with the global strategy of the parent company. As no world market exists for transfer of technology 47, so transfer of technology takes place under imperfect market conditions where the supplier has an upper hand in the bargaining process. Monopolistic practices of technology supplier place several barriers on the access of information particularly about specific production processes. The supplier countries protect or maintain their competitive position by limiting the commercial position of the recipient country through insertion of restrictive conditions such as patent system, trade marks and tying of technical assistance. The bargaining position of the recipient developing countries is


47 A Study of UNCTAD Secretariat, n. 5, p. 43.
weak. They frequently lack ability to decide what to produce because their management and marketing skills are of poor quality. There is a lack of domestic research and development infrastructure facilities. Consequently, they do not have national capacity for negotiating technological matters on equal terms with skilled and experienced representatives of the supplier countries. They are ill-informed about the alternative sources. The know-how which is transferred by suppliers leaves very little chance to the recipient developing countries.48

The supplier developed countries know that there is no domestic alternative to what they are offering. In addition to that, the developing countries have poor knowledge about the developments in the field of technology of the suppliers. Consequently, the industrially advanced suppliers are able to impose a price much above their own reserve price (prevailing price in their own domestic market) for a particular transfer of technology.

Besides this, the technologies transferred from the developed countries are often inappropriate. Technology developed in the industrial countries is inevitably suitable for their industrial societies and economies i.e. designed to produce the kinds of goods which an industrial country needs or do so by methods which are appropriate to the

48 Ibid., p. 12.
resource endowment of industrial countries. But when
these technologies are transferred to the developing
countries, they make use of "relatively scarce factors of
production (e.g. foreign exchange) and leaves abundant
factors idle (i.e. labour)". 49

Even in the acquisition of technology through training
of manpower sent to the developed countries, the gap in the
requirement of the recipient country and the training imparted
is too wide. These personnel often get specialized training
to be only efficient "cogs in the works and not as 'do most'
and 'know-most' people needed at home to take on the mantle
of leadership to identify and solve problems related to the
development". 50 People trained abroad are not useful to the
developing countries because their training is not suitable
to the local domestic conditions of the recipient country.
They find themselves out of place and go back to the supplier
developed country, where they get training. Consequently, the
developing countries are confronted with "the problem of
brain drain". 51 Not only are there fewer skilled hands left
in the developing countries due to lack of opportunities for
competent workers, but also the problems gets further accentuated

49 UN, Guidelines for the Study of Transfer of technology
to Developing Countries (New York, 1972), p. 6.
51 Walter Adams, The Brain Drain (New York, 1968),
p. 71.
by reverse technology transfer i.e. migration of whatever brain power is available in the developing countries. It pre-empts the possibility of future development in the developing countries. 52

The technology transferred by the developed supplier countries is detrimental to the interests of the recipient developing countries. These countries are still under the overt control of industrially advanced countries. The economic interests of most of the developing countries is undermined, even though there is no direct political pressure upon them. They have been increasingly concerned about technological constraints, which has accentuated their dependency over the industrially developed countries. Consequently, realizing the negative effects of technology transfer, many of the developing countries are resorting to various policy measures such as to regulate the inflow of technology, to reduce the cost of technology, to increase the independence of decision-making and promote technological innovations. In addition, confronted with the position of surplus labour and unemployment, most of the developing countries are in favour of appropriate technology.

The present pattern of technology transfer has failed to bridge the economic and technical gap between the

developed and the developing countries. In the name of technology transfer, the MNCs have sought to utilize local funds to improve technology developed for world-wide profit maximisation and not just to cater to the needs of the developing countries.

'MNCs' investment package' (capital and technology) brought from without into the developing economies naturally results in a more or less rapid growth of the host countries' productive forces. It builds new industries and modernizes the old ones - a process accompanied by the destruction of the old socio-economic relations and the establishment of new ones which acquire more and more features of the capitalist mode of production.53

Even though MNCs remain the principal source of industrialization and promoter of progress in science and technology in the developed world, they remain a major threat to the economic and political sovereignty of the developing nations. Presently, many developing countries do not know that they have, what is feasible or what they need. They are in a paradoxical situation. On the one hand, there is sharp realization in these countries that import of technology is essential for their growth, and on the other hand, there is dissatisfaction among them regarding the cost, conditions and content of imported technology.

53 Kharbalatov, n. 31, p. 158.
MNCs stand for dependent-development in the developing countries.

The development of natural resources will become economical in the developing countries only if the superior technology of the developed countries is used. Otherwise it is not possible for the developing countries to compete with the products of the developed countries. Experience shows that the developing countries cannot solve their problems individually. It is not possible for them to obtain simple technology at low cost from the developed countries. Further, they would not like to depend always on developed countries for technical know-how especially in matters of defence or strategic industries. So, the developing countries would like to cooperate among themselves in order to reduce their vulnerability for an external dependence and to increase their economic development prospects. The present emphasis is on self-help and adaptation of technology. An effective technology transfer depends on developing the policies for encouraging indigenous development of technology and also for absorption and utilization of imported technology.

54 Colombo Plan, n. 6, p. 15.
55 Sanjay Kathuria, "Technological Change in the Developing Countries", Economic and Political Weekly (Delhi), 20 October 1987, vol. 22, no. 4, p. 1716.
Emerging Pattern of Technology Transfer (MNCs of the South)

The developing countries' needs cannot be met under the present pattern of technology transfer. Despite their continued dependence on imported technology, the developing countries are conscious of the need to strengthen their technological capacity. Further, they agree that there is much to be gained from increased technical cooperation among developing countries particularly in areas where the technologies of the advanced countries are considered to be inappropriate. In this context, the new MNCs have played a considerable role in its absolute and relative expansion since 1970s. The MNCs in the developing countries have vast opportunities which arise due to differential advantages that they potentially enjoy over their western counterparts.56 These can be shown in Chart III.

The rise of MNCs in the developing countries of the Third World is a recent phenomena. A common definition of third world MNCs appears to be TNCs whose home base and dominant ownership/control are in developing

56 Inder P. Khera, "Technology Transfer from Third World Countries: Opportunities and Problems", Foreign Trade Review, April-June 1979, vol. 114, no. 1, p. 337.
### CHART III

**Differential Advantages of Third World MNCs**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Area</th>
<th>Third World MNC</th>
<th>Western MNC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Scale of operation</td>
<td>Flexible production capabilities</td>
<td>Less flexible in production techniques</td>
</tr>
<tr>
<td>2.</td>
<td>Factor contribution</td>
<td>Labour intensive</td>
<td>Capital intensive</td>
</tr>
<tr>
<td>3.</td>
<td>Flexibility of ownership</td>
<td>Equity in subsidiaries, prefer flexible and creative joint ventures</td>
<td>Total control over subsidiaries</td>
</tr>
<tr>
<td>4.</td>
<td>Investment source</td>
<td>Soft restrictions</td>
<td>Rigid restrictions and forerunner of economic imperialism</td>
</tr>
<tr>
<td>5.</td>
<td>Technologies</td>
<td>(a) Lower cost technologies, payment on soft terms.</td>
<td>(a) Very costly technologies, payment on hard terms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(b) Ability to offer unique technologies in semi-mechanised, agricultural,</td>
<td>(b) never found it profitable to develop such technologies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>herbal, medicine and jute manufacturing.</td>
<td></td>
</tr>
</tbody>
</table>
countries. They are sometimes termed "New MNCs". A number of new MNCs are substantial in size and generate significant surpluses. They generally invest in other developing countries, adopt relatively less capital intensive technologies and produce simple products more appropriate to developing countries' consumption pattern. The basic features of new MNCs are given below:

(a) They tend to compete on price rather than quality or uniqueness.
(b) Their specific skills and knowledge, to a substantial extent, arise out of and are adapted to their national, economic and technical environment.
(c) They are, on an average and in most individual cases, substantially smaller than First World MNCs.
(d) Presumably, as a result of their own national contexts, they are better able to understand and do appear responsive to Third World host country's concerns in respect to MNCs.
(e) Because of their smaller size, they are less able to internationalise transactions than the old MNCs. As a result of both, a smaller

57 Agarwala, n. 44, p. 293.
scale and less effective potential or actual home country backing, they are less dominant bargaining parties vis-a-vis Third World host countries or business partners.

They exist in most sectors from manufacturing through banking and from construction through trading houses. India is particularly prominent as it is having New MNC base in the manufacturing field and hotels. South Korea, Turkey, Egypt, Yugoslavia and Brazil are in construction. OPEC members, Brazil, Argentina and India are in banking. Singapore and Ethiopia are in airline transport, and Brazil, South Korea, Egypt and Yugoslavia are in trading houses. 59

A substantial number of new MNCs generate significant surplus and have ability to compete with other MNCs on fairly equal terms at least with respect to certain countries, markets and products. In some cases they have technology better suited to developing countries because their own basic background and orientation is that of Third World. 60 An eminent Professor L.T. Wells points out to the innovativeness of Third World MNCs. Their


60 The New MNC may be complementary to the activities of the old MNCs because their flexible management style is appropriate to the conditions of the developing countries or because of the flexible application of known technology. Ibid., p. 218.
technologies and their know-how are more flexible and more amenable to the local resources. They specialize in labour intensive standardized technologies usually adapted to local conditions. The investment typically flows to countries at a lower or occasionally at the same level of industrialisation.

The use of more labour intensive technologies by New MNCs results from two factors. Firstly, they invest in sectors like textiles and shoe making which are still more labour intensive. Secondly, these New MNCs do not have freely accessible technologies which are taken from industrial countries and adapted in the home country of the new MNCs. They have developed some special advantages in the operation and transfer of relatively simple, old technologies which are strengthened by cheaper manpower. These technologies may be more appropriate for the smaller markets, so that production with these technologies can reach a significantly higher capacity utilization. Another advantage is that these technologies can be better integrated into the real economic process of the host country because the level of technology is, in general, not far higher in home country of the investor. Domestic

61 Carlson, n. 58, p. 131.
technological capabilities may be developed more easily on the basis of such technologies.

Besides this, new MNCs are more ready to engage in joint ventures with local capital of the host countries. The MNCs often avoid joint ventures in order to have their technological monopoly and their product differentiation is a barrier to the entry of local firms. Most of the joint ventures with the participation of new MNCs have a local majority participation and a high degree of autonomy vis-a-vis headquarters. New MNCs produce relatively simple products which do not compete in the area of product differentiation (with high technological intensity and advanced marketing) but on the basis of price. These characteristics make them conform to a strategy of producing for mass consumption while products of old MNCs are often considered to be more in the area of luxury. In spite of the unique advantages in certain areas enjoyed by the new MNCs over their western counterparts, the two are by no means equal. Western MNCs still enjoy overwhelming advantages in size, wealth, technology, research and development, managerial skills and the like. Consequently even though the new multinationals may be suited to certain types of foreign investments, they are far behind Western multinationals in their overall capabilities to exploit profitable foreign opportunities. The main reasons for this can be their scarce resources, limited access to hard
currencies and severe and unnecessary restrictions imposed by the government.

It is true that Third World MNCs cannot have an advantage in what are normally high-technology industries, in activities which are complex, capital intensive and innovative. They have not had up to now assets like technological superiority, extended product differentiation and established access to world markets. They must still depend upon Western MNCs for technology, resources, managerial skills and sometimes markets and distribution channels. Moreover their experience in using and adapting labour intensive, small scale production techniques to produce undifferentiated products of low to medium quality at lower cost has been emphasised by many scholars. They are dependent on local cooperation because they cannot always offer complete package (for example in areas of marketing, distribution and local financing). MNCs of the South are not competing directly with the firms of advanced countries but their specific adaptations have

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63 Product differentiation generally requires large and rich markets and is generally an acknowledged area of old MNCs, with few exceptions of Latin American firms (in pharmaceuticals and soft drinks), third world MNCs are not able to compete in products where advertising, product variety, rapid model changes are important components in corporate strategy. Carlson, n. 58, p. 132.

64 Ibid., p. 131.
given them a unique asset. The know-how they offer is more in the way of management technique rather than a source of patentable knowledge. To some cases, they have had management approaches and technologies better suited to the developing country because their own basic background and orientation is same. That is why, their acceptance by a host country is greater. They are fast becoming a major instrument of industrialization of the developing countries. They increase the room to manoeuvre and the relative bargaining power of the host by providing alternatives to the western MNCs.

But this does not mean that the traditional pattern should be done away with under the new pattern. The western MNCs will continue to remain the fountain head of technology. The advanced and sophisticated technology of western MNCs and its efficient scaling down would be beneficial for the recipient developing countries. The relatively smaller size, lesser economic links and weaker (in terms of leverage available) home governments of the developing countries probably attract the attention of MNCs of the South. Now they are more concerned about the policies of western MNCs. They try to reduce the danger of intervention or confrontation with them. However, regardless of where technology originates, the supplier (whether from a developed or developing country) must share the responsibility for evaluating its appropriate-

65 See at page 103
ness in terms of the recipients needs. "From whom technical cooperation is sought will remain a question of appropriateness of technology to be supplied and its modes of transfer". The growing technical needs of developing countries necessitate much greater technical cooperation at the international level.

As the technological capability in developing countries increases, there is a greater scope for technical cooperation among themselves. It is of greater benefit than obtaining technical cooperation from the developed countries. So, the developing countries need to encourage cooperative efforts and also need to devise more enlightened policies regarding the overseas activities of their firms. Further, the developing countries also require more cooperation from the developed countries for their efforts to achieve self-reliance. In fact, technology selected from the developed countries should be supplementary to what is available in the region and complementary to indigenous technology. The existing vertical integration between the 'centre' and 'periphery' will have to be reduced by a vigorous expansion of South-South relationship, otherwise the developing countries will continue


66 Colombo Plan, n. 6, p. 3.
merely to react to and bear the adverse consequences of the economic events in the developed countries.

The issue for the developing countries is not whether to cut their links with the developed countries, but how to transform them. The transfer of technology through traditional channels has not proved very effective in narrowing and closing the technology gap between the North and South. The process has led to a series of asymmetries. Therefore, the relationship must be changed from exploitation to shared benefit and from subordination to partnership.

The MNCs of the developed countries are perhaps a necessary evil. They aggravate the dependency syndrome of the developing countries which is harmful to the long-term interest and progress of humanity. Simultaneously, they are thought to contribute to regional and functional integration or other cooperative efforts. In fact, the threat posed by the existence of MNCs may prompt the developing countries to adopt common policies to counteract, adapt to or to get the most benefit from them. The process of technology transfer by western MNCs has helped some developing countries to increase their technological capabilities. The stress of the 'selective delinking' 67

strategy is to build up national technological capacities with autonomy rather than dependence (autonomy implies greater selectivity in and closer control of externally acquired technology).

The new MNCs in the emerging pattern of technology do not call for the termination of the existing pattern. It recognizes that technical cooperation should be free from restrictive practices. In addition, it calls for sharing the responsibility in the transfer of technology. The major concern of the developing countries is to build and strengthen institutional infrastructure in terms of not only experts but also of materials and equipments. These will provide adequate training facilities to enable the developing countries to absorb and adapt the imported technology in accordance with their socio-economic needs.