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Report on south-south industrial co-operation

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INTRODUCTION

The Asian experience has clearly proved that the existence of a solid industry is a prerequisite to development.

The efficient development of industry requires a broad range of technological capacities which can only be acquired by a long process of learning based partly on the experience of production, partly on importing "ready made" knowledge and technology and partly on a deliberate process of investing in the creation of knowledge. Technical capability is not acquired simply by producing a quantity of engineers, technicians and managers from the education system, though obviously an absorptive base of trained manpower is a necessary condition for technological improvement. Neither is it acquired entirely by an automatic "learning by doing" process. Thus, the countries on the way to industrialisation do not only request machines but also technology, know-how, managerial capabilities transfers...

1 Scope and definition of industrial co-operation

11 Definition

Industrial co-operation present the following characteristic features:

- the duration of the operation in contrast with the punctuality of an exchange of goods or services
- the duality and the natures of the actors: two or several enterprises, professional associations, research institutes... co-operate
- the purpose: development of physical and /or human capacities of production with a variable commitment on expected results
- the transfer of industrial capacities: beside a possible financial or service provision,there is a transfer of scientific an/or technological information, know-how or industrial capacities
-the motivation: commonly an underlying merchant interest
- role of public institutions and non-merchant operators: frequent intervention as initiator , moderator or co-ordinator

Industrial co-operation locates in fact between two classical types of international activities, that is between an investment operation and a purely commercial transaction, the responsibility being shared by the partners.

12 Rationale for co-operation

Promoting and/or responding to technological changes in industry in the 1990s will require more than ever organisational, managerial and research and development resources which go beyond the capabilities of single companies and even countries. A pooling of resources and sharing of experience are required in many areas to co-ordinate and enhance national technological efforts. This is a reality of in both developing and developed countries but it is even less avoidable in developing countries because of the scarcity of resources and capacities.

The growing number of industrial co-operation activities among developing countries might lead to positive evolutionary changes by allowing the junction between forces and will and technological, industrial and financial capabilities and thereby contributing to reach a better allocation of national resources, to benefit from scales economies and new displays and to enhance complementarities and similarities among countries.

Moreover is an indirect strategy of internationalisation. It might indeed be a way exporting for small and medium enterprises as well as a new form of investment for larger companies.

13 Typology

After the scheme presented in the evaluation report on ECDC/TCDC activities[1], we suggest the following typology of industrial co-operation activities:

	Short-term or Ad-Hoc	Long-term
Acquisition of inputs	Equipment delivery	
	Technology and know-how acquisition (Licensing, franchising)	
	Technical assistance	
	Turnkey contracts	
Mutual exchanges	Information exchange	
	Expertise exchange	
		Professional associations
Pooling of resources and needs		Joint-ventures
		Sub-contracting
		Twinning arrangements
		Multinational companies

• Equipment delivery, technical assistance. One enterprise provides services (technical assistance, training...) or goods (machine-tools, hardware, software...) to another enterprise with a various counterpart. The "co-operative degree" of such an arrangement is defined by the type of counterpart.

[1] Evaluation of the ECDC/TCDC activities of UNIDO, ODG.14(Spec.), 1992

Commercial exchange < ========== > Co-operation

Financial counterpart ... Barter ... Buy-back etc

• Technology and know-how acquisition. This might concern a technology or know-how that has been transferred into the public domain (books, conferences...) as well as a protected technology or know-how that would be purchased through a licensing agreement for example.

A licensing agreement is a contract in which a licenser provides a local license with access to one or a set of technologies or know-how in return for value which can take various forms: an initial lump-sum, a percentage of sales, royalties, buy-back etc

The patents on the other hand gains access to either know-how (that is secret, unpatented technology), trademarks, copyrights and patents or a combination of these for a specified or non-specified duration. Licensing agreements may call for the training of local personnel by the licenser or by the supplier of technical assistance in the case of technical assistance agreements.

The licensee is usually given defined right of access to and use of proprietary knowledge possessed and retained by the licenser The licenser is not selling the technology *per se* but his rights to future income from his contribution of technological capital to the licensee's operation..

• Turnkey contracts. The contractor is responsible for setting up a complete production unit -factory, energy plant etc - or project in the host country. The specific responsibility may vary from project to project and might cover feasibility studies, provision of technology and know-how, basic design and engineering, supply of complete plant or equipment ... The term "turnkey" refers to the fact that the contractor's responsibility is considered as fulfilled only when the plant or the project is fully operational . In some case an operation and/or maintenance agreement is included. Turnkey contracts might involve more than two partners.

• Information exchange. They involve individuals, institutions, entrepreneurs...who exchange information on a particular topic, issue or technology e.g. at the event of a meeting (e.g. Workshop on leather industry in Islamic Countries[2]). All parties benefit provided availability and quality of information is even.

In the frame of institutions, information exchange might become regular through ordinary meetings or conferences, written periodicals, automated databases etc

• Expertise exchange. Enterprise or industrial service institutions may exchange expertise possibly by extending visits to each others facilities, by sharing common

[2] Leather industry in Islamic countries, UNIDO project number, 1995

facilities... the exchange can take place either in the same field or in complementary fields. It might as well take a contractual form in case of training or consultancy.

• Professional associations. They serve the purpose of coming to joint propositions on certain issues and finding common approaches in a continuity perspective and on the basis of organised structures. The advantage of this type of co-operation lays in the subsequent harmonisation of policies, procedures, standards, as well as in having a stronger position to lobby for or defend the interests of the group and in enhancing the networking capabilities.

• Joint ventures. Normally imply the sharing of assets, risks and profits, and the participation in ownership of a particular enterprise, project or enterprise by more than one firm or economic group. The distribution of equity shares in a joint-ventures might be determined according to each partner's financial contribution or based on other forms of contribution such as technology, management, access to world markets, local resources etc. The so-called fade-out agreement (or phase in when referred to from the host country) generally involves an initial equity participation by the foreign investor of more than 50%, sometimes up to 100%. It is nevertheless agreed contractually that ownership will be subsequently transferred to one or more local parties. This might be planed gradually across several phases. Once the fade-out process has been completed, the foreign investor may retain minority or zero participation. It may however retain direct investment in or even control over certain aspects of the business such as international marketing or management.

• Sub-contracting. A central or major company might sub-contract certain tasks or the production of components and parts to outside companies thereby taking advantage of more specialised expertise, better cost-benefits ratios etc. Sub-contractors benefit from the contract in terms of earning and international contacts which give indirect access to international markets through the sub-contracting company.

• Twinning arrangements. A continuous exchange in expertise and/or technology may result in joint research, joint production programmes etc., whereby co-operation is not necessarily bound to take place in the same premises. It may comprise the exchange of results in research and application as well as the division of labour in research programmes, tests and trials, production etc in which co-operating institutions or enterprises have complementing advantages.

This list does not pretend to be exhaustive but it nonetheless contains the most frequent forms of industrial co-operation.

Our position was not to classify technology transfer as an industrial co-operation in itself as it is the case in some literature. Technology transfers are indeed operated through various supports, that is:

- machine and equipment (capital embodied)
- men (human embodied)
- paper or any other informative support (disembodied)

As from then, they are part of most of the above-mentioned operations.

2 Trends towards extended transfrontier connections among developing countries

21 The multiplication of regional programmes and projects

The operations mentioned in part 13 take place in the context of sectoral, national or regional commitment embodied in agreements, programmes etc.

The trend towards joint programmes, projects and institutions in selected areas is becoming stronger. It is concrete in developed countries and especially Europe with numerous programmes like RACE (Research and development in advanced Communication technologies)...but it is also visible in developing countries (e.g. ASEAN Plan of action on Science and Technology for Development...).

Co-operation among developing countries is essentially stimulated by Nies which are aware that co-operation might strengthen the position of the South in the international system and have the capacity of initiating and pursuing co-operation.

The regional and sub-regional levels appear to be the logical starting point for co-operation among Developing countries, in particular in the areas where economic co-operation and arrangements such as the Association of south-east Asian Countries (ASEAN), the Andean Pact, the Gulf Council for Economic Co-operation (GCC), the Southern African Development Co-ordination Conference(SADCC)... already exist.

The above-mentioned ASEAN Plan was developed as early as 1981 considering manufacturing industries, transportation and communication as priorities. Furthermore, efforts have been underway to reach ASEAN Industrial standards harmonisation.

Industry- related co-operation might cover a wide range of issues but it appears that the potential has remained partly unexplored. The identification of common issues and challenges facing countries in different regions can lead to fruitful interaction and should be considered as one of the thrust areas .

22 Evolution of South-South exchanges

Quantitative data on global industrial co-operation are unfortunately difficult to obtain in reason of multilateralism and absence of homogeneity in the industry-related co-operation mechanisms. Nonetheless it is obvious that industrial co-operation operations would not exist

independently from other South-South relations and have an impact as well above as below trade flows.

Despite a stagnation due to the oil crisis towards the end of the eighties, exchanges among Developing Countries have intensified over the last 20 years. The amount of South-South exchanges in the world-trade rose from 3.5% to 7.5% in 1982 and has remained stable since then. In 1990, the South-South trade represented US$ 135,9 billions (versus US$ 24,1 billions in 1973). This improvement has been possible thanks to the dynamism of the Nies which have realized the non-permanence of the comparative advantage and have operated and promoted diversification.

The structure of the exchanges has also changed. The part of manufactured goods in South-South trade has risen from 30,3% in 1970 to 58,1% in 1991 (see table 1) which reveals the shift in both demand and supply.

Table 1: Evolution of South-South Trade
(Part of South-South exchanges in per cent)

	1970	1980	1991
Agricultural raw material	10,9	4,2	3,5
Food Items	20,4	11,0	10,4
Ores and metals	4,7	2,5	5,2
Fuels	33,7	54,4	22,8
Manufactured goods	30,3	27,9	58,1
Total	100	100	100

More precisely, intermediate and equipment goods like steel, chemicals and machine tools are becoming increasingly important. These exports reveal a real dynamic that allow an evolution of altogether technical capacities, credit, trade, research and organisation. Starting from here, a number of countries are building and improving the base of their exports and sales of industrial elements.

For example, South Korea, India, Taiwan and others considered initially as low cost consuming goods exporters have reached solid positions as industrial product deliverers on the South market. It is to note that those semi-industrialised countries export goods involving

more capital and labour rather towards developing or border close countries than towards Northern country and that roughly 3/4 of South exports are oriented towards small and medium countries.

Western transnational companies seem to have very little impact on technology exports originating from semi-industrialised countries. Even Brazil and Argentina, though characterised by the important role of transnational companies owe the dynamism of their technology exports to local private companies.

The evolution is mainly due to:

- the promotion and diffusion of local engineering capacities
- the implementation of financial measures (opportunities for industrial loans) to promote the exportation of industrial equipment or plants
- the creation of international trade webs
- the increase in FDI among developing countries: the outward stock of FDI from Developing Countries was US$ 105 billion in 1990 up from US$ 37 billion in 1980[3] (albeit most flows originate from Brazil, China and Korea)

To sum up, the South tends to exploit new supplies by exploring its own resources. South countries propose easier, better adapted and cheaper technologies. Taiwan for example has reached a comparative advantage by proposing „small industry projects" like the production of small metallic and plastic items, soap, sugar... Brazil is a relevant technology exporter that promotes and sells industrial co-operation and/or engineering services after having experienced the projects on its own territory (e.g. dairy industry)[4].

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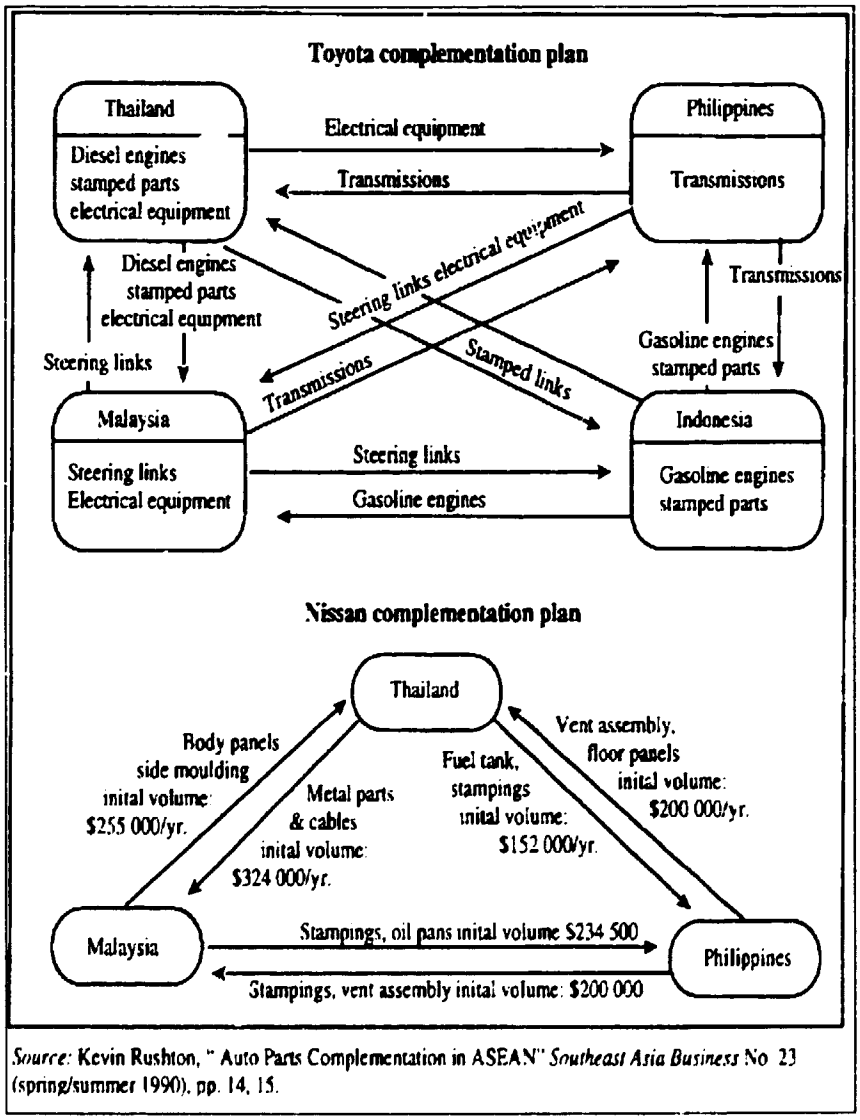
[3] World Bank estimate based on UNTCMD, Transnational Corporations from Developing Countries (UN publication E93.II.A.48, p 24-25)

[4] Dairy Industry, UNIDO project number, 1995

AIC aims at promoting complementary trade exchanges of specified manufactured products among private industry. So far, only automotive parts and components complementation scheme among Malaysia, Thailand and the Philippines has been implemented.

ASEAN complementation scheme for the automobile industry



Source: Kevin Rushton, " Auto Parts Complementation in ASEAN" *Southeast Asia Business* No 23 (spring/summer 1990), pp. 14, 15.

AIJV promote relatively small-scale private sector projects which receive tariff preferences if they have partners from 2 or more ASEAN countries and are guaranteed against governmental expropriation or nationalisation. They allow up to 60 per cent foreign ownership of equity. In July 91, 18 AIJV projects had been approved with a concentration in auto-components.

The ASEAN Chamber of Commerce and Industry, which is a voluntary association of the national chambers of commerce has played an important role in these developments. It moreover offers alternative tools to identify and conduct industrial co-operation projects in particularly the Regional Industry and Commodity Clubs and the Joint Business Councils.

ASEAN automotive industry scheme for example was implemented by the ASEAN -CCI in collaboration with the ASEAN automotive Federation and the COIME (Comity on industry, minerals and industry).

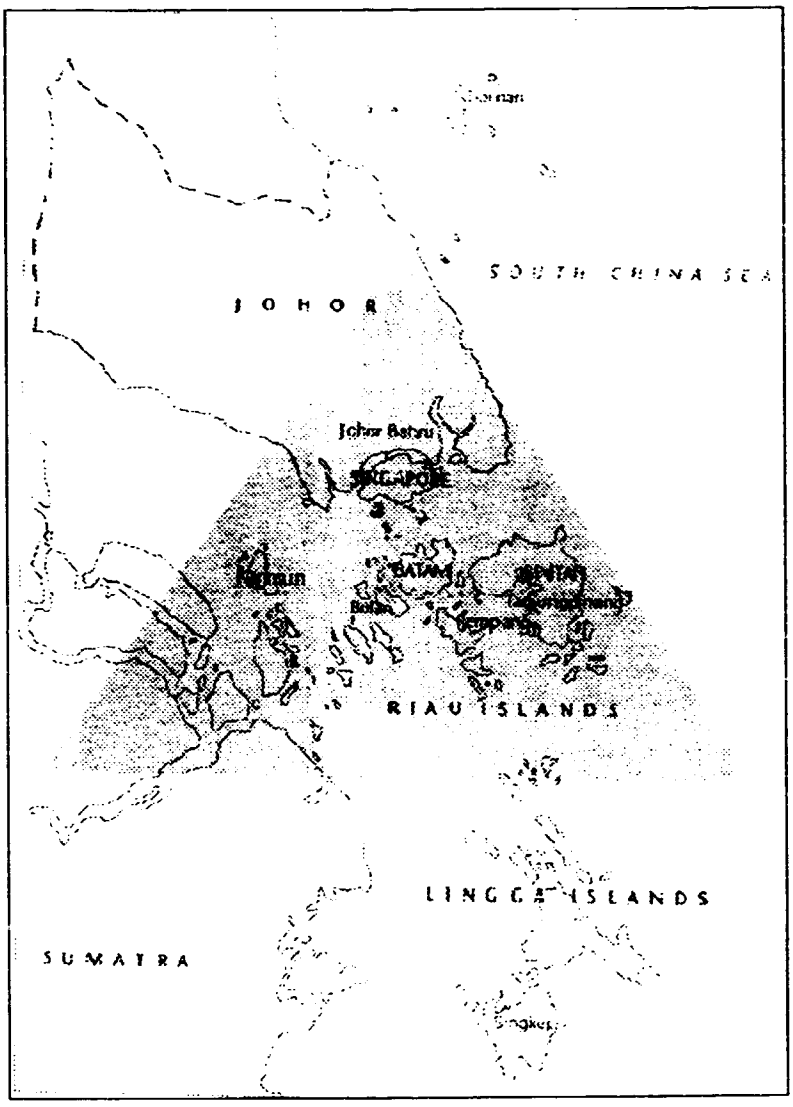
The Regional Industry Clubs retain a potentially important role as business association through which the private sector can interact and develop contacts leading to cross-national joint-ventures.

2 A leading concept: growth triangles

The concept of the Asian growth triangles consists in developing each nations competitive advantage as decided by the market in order to attract foreign investment. It is outwards oriented and does not necessary entail equal benefits to each member.

The first effective triangle has been the Riau-Johor-Singapore triangle combining Riau and Johor's cheap land and workforce and Singapore's human skills, technology and managerial capacities, the Indonesian, Malaysian and Singapore governments have worked together to attract investment through joint investment promotion missions, joint infrastructure development, co-ordination of national investment policies letting the private sector decide where the investment should go according to the comparative advantage of each territory.

The growth Triangle



The efforts have led to substantive results like the mega-project of the Batam Industrial Park. The Taiwanese government intends to invest US$ 10 billions that will be put up by Taiwan state owned companies like the Taiwan Development and Trust Corporation, China Steel and China Petrolcum... A 340-hectares industrial park is to be developed over a decade. The project has also involved the private-owned Indonesian company Kayu Lapis Group. The project includes among others a processing centre for Taiwan's deep-sea fisheries industry, a high-tech electronic park and a row material processing centre.

Other growth triangle are foreseen within ASEAN, that is:

- the Northern Malaysia port-city and industrial centre of Penang and its North-Western Malaysian hinterland
- Medan and Northern Sumatra
- Southern Thailand to the city of Phuket

on one side, and

-Southern Philippines, Sabah in Malaysia
- North-western Kalimantan in Indonesia
- Sulawesi in Indonesia

Some triangles are also in operation outside of ASEAN like the Honk-Kong-Taiwan-Southeastern Coastal China.

The Singapore-Johor-Riau growth triangle experience suggests that inter-governmental co-operation may be necessary for joint-exploitation of comparative advantage. Joint infrastructure development, co-ordination of incentive policies and promotion missions, high profile official exchanges appear to have been successful in generating private sector investment where market forces alone had not done it.

32 India: far from trade and technology theories

India is an important actor of South-south co-operation. The countrie's TCDC activities are dated back to 1950. The Indian technical assistance and Economic co-operation (ITEC) has been institutionalised since 1964 and assistance has been granted to more than 50 countries over the last 25 years. The programme consists in training facilities in India, deputation of Indian experts abroad, gifts of machinery and equipment, assistance for conducting feasibility studies and undertaking of specific projects.

Starting from an initial Rs 0.44 million budget in 64, the project involved more than Rs 100 million in 1990. A number of agreements have been signed with Malaysia , Jordan, Bahrain, Saudi Arabia, Vietnam, Qatar, Zimbabwe, Mexico etc. The specialised fields of training have included different aspects of civil aviation, meteorology, engineering, agriculture, food and sugar industry, mining etc. Gifts of equipment, material and books have been made to Afghanistan, Burma, Malawi, Fiji, Laos, Yemen Sri Lanka, Thailand, Togo, Seychelles, Somalia, Vietnam, Zaire, Maldives.

Beside these assistance actions. India has also been involved in more co-operative processes. We will focus on:

- trade transactions and particularly exports of capital goods
- FDI and joint-ventures

It would have been interesting to consider project exports as well but data are relatively out-dated. Studies of 1985. show that at this time. construction projects of India were essentially concentrated in the middle-east region. In the case of turnkey contracts. the exports were mainly directed to Asia and particularly the middle East. Licensing. consultancy and technical assistance exports were widely spread in direction of both developed and developing countries.

1 Trade transactions

The data related to trade give indications on Indian's involvement in South-south co-operation. They must though being looked at carefully since India is not an export-oriented economy. As a consequence exports are made only after satisfying the internal demand. International transactions therefore represent only a marginal percentage of GNP but they still show a picture of Indian partners.

The trade of commodity goods is relevant to the matter of industrial co-operation since the selling industrial machines is a proxy to a technology transfer.

Table n°2: India's exports of capital goods
(in million US$)

Region	1970	1975	1980	1985	1993
Developing countries	88(93)	273(86)	498(80)	303(54)	255(71)
ESCAP					
ASEAN	10(11)	108(34)	201(32)	122(22)	126(33)
Others (incl SAARC)	2	50	82	31	68
	8	58	119	91	58
Others (Including W.Asia, Africa)	78(82)	165(52)	297(48)	181(32)	129(35)
Developed countries	6(06)	24(07)	72(12)	61(11)	102(27)
North America					
Western Europe	--	2	26	30	31
Others	5	16	41	27	64
	1	6	9	4	6
Others	1(01)	21(07)	49(0.8)	197(35)	15(04)
Total	95(100)	38(100)	623(1000	561(100)	372(100)

Source: compiled from the United Nations commodity trade statistics

This figures show that most of India's exports of capital goods go to developing countries though the trend tends to be less striking.

India also used to have a considerable technology trade flow with the former USSR with whom it had developed number of barter arrangements.

Among the developing countries. Africa and the Middle East have been the main markets for India's export until the beginning of the 90s when it started considering the growing demand in the ESCAP (Economic and Social Commission for Asia and the Pacific) region especially in the south-east. Within the ESCAP region it is noticeable that exception made to Bangladesh. Indians exports to further countries have been more consequent.

Table n°3: India's exports to ESCAP developing countries in 1993 (in million US$)

estination	Amount
Bangladesh	16.7
China	0.4
Hong Kong	6.5
Indonesia	9.8
Korea North	1
Korea South	1.3
Malaysia	27.6
Myanmar	0.1
Nepal	8.7
Pakistan	0.8
Philippines	2.5
Singapore	18.8
Sri Lanka	17.3
Thailand	9.5
Vietnam	3
Other Nies	1.4
Total	125.4

Malaysia and Singapore are indeed the first ESCAP trade partners of India regarding capital goods. Bangladesh and Sri Lanka only rank respectively third and fourth. This situation does not favour the hypothesis that geographic proximity stimulate trade. Other reasons such as market demand, profit, counter trade possibilities seem to play a more capital role in the case of India.

These facts remind to be cautious in applying the traditional trade theories to India's technology trade.

The dramatic drop of exports to Eastern Countries after the fall of the Berlin Wall proves that trade with Eastern country was not guided by purely commercial considerations. Beside the weakness of socialist countries in innovative capacities and a common approach of economy which have lead to similarities of demand patterns, it seems that political agreements were not absent.

The concentration of India's capital goods exports to developing countries might be to due to the fact that the lags in innovative capability prevent from exporting to developed countries.

Technology exports indeed usually flow to countries that are lagging behind India. Hence, the lasting higher exports to Africa and to the middle East.

However the recent data show a significant decline in India's exports to the South. To a large extent the data support the hypothesis that exports from developing countries are likely to go to countries with similar patterns, that is to other developing countries. The majority of India's exports still go to other developing countries, including West-Asia. Higher exports to the quick improving countries of ASEAN imply that the demand pattern does not alone determine the direction and volume of trade flows. The magnitude of demand and the production patterns in both the exporting and the importing country also play an important role. A difference in production patterns indeed create a potential for trade between to countries that otherwise would be competitors on the international market.

The raise in exports of capital goods to developed countries might be explained by the fact that most of the capital goods exports of India entail standardised and mature technologies. The low-cost of production being the main competitive factor at this stage, India is able to export to developed countries to whom production of these items is no more attractive. This phenomenon is clearly visible in the exports of engineering goods.

Table n° 4: Exports of engineering goods region wise
(Value in US$ millions)

	1980	1983	1985	1987	1990	1992
DEVELOPING COUNTRIES	754.5 (68.9)	521.2 (59.9)	375.7 (45.6)	424.6 (44.3)	381 (40.8)	589.5 (63.6)
ESCAP (except Oceania)	282.8 (25.8)	158.3 (18.0)	161.5 (19.5)	186.2 (19.5)	215.3 (23.1)	292.1 (37.5)
SAARC	131.7 (12.0)	48.4 (5.5)	98.9 (12.0)	103.1 (10.8)	29.4 (3.1)	59.8 (6.4)
ASEAN	117.5 (10.7)	71.1 (8.0)	36.7 (4.5)	53.9 (5.6)	118.6 (12.7)	155.6 (16.8)
Others	33.6 (3.0)	39.2 (4.5)	25.9 (3.1)	29.2 (3.0)	25.2 (2.7)	76.7 (8.3)
Middle East	244.1 (22.3)	207.9 (23.6)	98.1 (11.9)	115.4 (12.0)	61.3 (6.5)	147.8 (15.9)
Africa	218.2 (19.9)	159.6 (18.0)	112.8 (13.7)	119.2 (12.4)	95.9 (10.3)	143.5 (15.5)
Ding America, Ding Oceania	9.4 (0.9)	2.4 (0.3)	3.3 (0.4)	3.8 (0.4)	8.5 (0.9)	6.1 (0.6)
DEVELOPED COUNTRIES	241.5 (22.0)	201.6 (22.9)	181.9 (22.1)	266.0 (27.1)	173.6 (18.6)	288.5 (37.7)
WEurope	119.7 (10.9)	82.2 (9.3)	76.0 (9.2)	123.1 (12.9)	102.9 (11.0)	148.9 (16.0)
NAmerica	94.9 (8.7)	84.6 (9.6)	89.1 (10.8)	111.5 (11.6)	58.8 (6)	117.2 (12.6)
Japan	11.3 (1.0)	15.5 (1.8)	7.8 (0.9)	15.4 (1.6)	2.0 (0.2)	4.3 (0.4)
Dved Oceania	15.6 (1.4)	19.3 (2.2)	9.0 (1.1)	10.0 (1.0)	7.6 (0.8)	14 (1.5)
Others	--	--	--	--	2.3 (0.2)	4.2 (0.4)
OTHERS	99.5 (9.1)	149.9 (17.0)	265.7 (32.3)	273.1 (28.5)	377.2 (40.5)	48.9 (5.3)
Total	1095.5 (100)	880.1 (100)	823.3 (100)	957.7 (100)	931.8 (100)	926.9 (100)
Software and services*	--	87.0 (9.0)	73.6 (8.2)	84.6 (8.0)	102.8	na
GRAND TOTAL	1095.5	967.2	896.9	1042.2	1034.6	na

NB: The numbers in parentheses are percentages of total exports
* percentage of Grand total

Source: compiled from the Hand Books of Statistics of the Confederation of Engineering industry, New Delhi and the Commodity Trade Statistics of the United Nations

The rise of new industrial powers also affected the exports of engineering goods. The ASEAN countries which used to be important customers for Indian engineering goods are now competing with India on international markets. The SARCC markets show wild fluctuations. The African region which was a good market is loosing its importance. These market losses used to be partly compensated with the eastern countries and especially the USSR until its desegregation.

While the ratio of Indian engineering goods going to the developing countries has been declining rapidly, the ratio of exports to developed countries is increasing steadily, though not significantly. On the whole, exports of engineering goods have been declining . The regressing economic situation in some developing countries (i.e. African continent) and the evolution of ASEAN may have influenced India in its new orientations towards the developed countries. The engineering industry has taken advantage of the liberalisation of the Indian economy in the 1980's and modernised its plants to produce more sophisticated items(e.g. software) which are suited to the developed countries.

2. FDI and joint-ventures

India's investment abroad began in the 1960s when a few companies set up production facilities in Sri Lanka, Iran and Kenya. There were though very limited (roughly ten of projects).

In 1980, Indian investments abroad amounted to US$ 117 which in terms of volume which is not significant. However, Indian investments are usually under-estimated because of practices consisting in operating investments over Hong Kong, Switzerland and Liechtenstein[5] in order to evade the Indian governmental controls. Moreover, it seems that only a minimum percentage of Indian investments take the form of cash contribution.

1. Joint-ventures

In 1988, there were 158 overseas joint-ventures in operation with an equity investment of about Rs 931 millions. Another 24 joint-ventures were under implementation.

[5] Lall, Third World multinationals,1992

Table n°5: Joint-ventures (investment by region)
In million rupees, 31.12.1987

REGION	Units in operation			Units in implementation		
	Number	**Equity**	**% of total**	**Number**	**Equity**	**% of total**
Africa	26	358.41	38	6	50.28	27
OECD	26	41.03	04	8	54.19	29
W. Asia	16	26.27	03	2	2.59	01
SE Asia	60	413.49	44	3	16.90	09
S. Asia	26	89.20	10	5	60.32	33
Oceania	04	2.79	01	-	-	-
Total	158	931.19	100	24	184.28	100

Source: Indian investment centre

NB: values are nit converted into Dollars due to the fluctuations in exchange rates.

This table shows that at the end of the 1980s, over 95 percent of Indian outwards investments (value wise) is directed to developing countries, with 54 percent in the ESCAP region, 40 percent in he African region and only 3 percent in West Asia. However, the projects in implementation indicated dramatic increase of investment in OECD countries.

The projects in implementation indicate that Indian multinational companies have started diversifying their investment into new geographical areas, like the OECD countries. West Asia the largest potential market for Indian technology had been further neglected. This figures meanwhile does not show probable contributions in form of technical and management services, with cash contribution from local investors.

Table n°6: Indian overseas ventures country wise

Country/region	On 31.12.1985		On 31.12.1988		
	Investment	Repartition	Units in operation	Units in implementation	Total
S. E Asia	--	--	53	06	59
Thailand	160.6	31.3	09	01	10
Singapore	86.7	4.4	12	03	15
Malaysia	148.5	48.8	17	02	19
Hong Kong	1.0	83.3	03	--	03
Philippines	40.0	0.2	01	--	01
Indonesia	195.1	19.0	11	--	11
South Asia	--	--	24	03	27
Sri Lanka	36.3	1.8	16	--	16
Nepal	43.6	3.3	08	02	10
Bangladesh	--	--	--	01	01
Oceania	--	--	04	02	06
Tonga	--	--	01	--	01
Solomon Islands	5.3	--	01	--	01
Fiji	1.4	1.5	01	--	01
Australia	0.7	--	01	01	02
New Zealand	--	--	--	01	01
West Asia	--	--	15	--	15
Bahrain	7.9	1.7	01	--	01
Oman	3.5	--	02	--	02
Saudi Arabia	12.6	17.7	04	--	04
U.E.A	3.5	8.5	07	--	07
Jordan	--	--	01	--	01
Africa	--	--	28	03	31
Kenya	120.3	78.1	08	--	08
Nigeria	85.2	70.9	13	02	15
Mauritius	7.2	--	03	--	03
Egypt	13.5	--	01	--	01
Uganda	2.8	--	01	--	01
Senegal	142.2	--	01	--	01
Seychelles	30.8	--	01	--	01
Europe	--	--	21	09	30
UK	43.5	2.0	13	05	18
WGermany	8.2	126.5	02	02	04
Gibraltar	--	--	01	--	01
Greece	2.5	--	01	--	01
Switzerland	21.0	2.9	01	--	01
Yugoslavia	--	--	01	--	01
Hungary	--	--	01	--	01
USSR	--	--	01	--	01
France	--	--	--	01	01
America	--	--	07	04	11
USA	9.5	--	07	03	10
Panama	--	--	--	01	1
Total			152	27	179

Source: Investment Centre of New Delhi

NB: the tables n° 6 and 7 show some discrepancy between 1987 and 1988 this is due to the high drop out weight of investors and to the failure rate of small companies

As can be seen from the tables 6 and 7, Indian investment in the neighbouring countries is not significant, neither in terms of number of units nor in volume of investment. Similarly to the technology exports patterns, FDI is disconnected from international trade theories: if similarity of demand patterns and proximity were the factors which determine the direction of trade, FDI indeed would also have flowed mostly to the neighbouring countries. Indian investment seems to have flowed rather into more prosperous regions like South-east Asia. Their is a very little technology gap between India and the south-east Asia, which incites to view the investment flows in terms of pooling of resources. Both Africa and South-Asia lagged behind India in regarding technological strength. Africa has attracted more investment which coincides with the ideology of Indian politics and the ties with the Indian Diaspora.

The country-wise table show that investment mostly flowed to countries where there were an important concentration of Indian ethnic population. Indian ethnic have indeed been in business and acquired substantive amount of capital to be invested in industry. However, the analyse of the projects in implementation at the end of 88, show that ethic ties have been gradually loosing their influence. After numerous bad experiences with Africa, India has started to be reluctant to invest on the basis of its ethic and ideological sensitivities. Indian companies have started to be more rational and started to invest rather in developing countries and as mentioned before, in south-east Asia. They have also gained confidence and are in the process of moving out of the low technology phase. The investment in developed countries might reinforce the achievements by enabling access to new and higher technologies.

However, this data must be looked at cautiously, since they do not cover Indian licensing, plant exportations and consultation services. Moreover, it seems that registered subsidiaries are used to establish further subsidiaries in order to evade Indian's regulations.

The case of India demonstrate that technology transfer among developing countries are a feasible proposition. Though most of the industries tend to be small scale and labour-intensive technologies like textiles, food processing etc, the data show that the Indian transnational companies are even able to compete in advanced capital and skill intensive technologies. The Indian domestic policies have had an important impact on Indian technology and on the nature of industrial co-operation. Being an import-substitution economy, India has had rigid controls on import and Indian companies have not been allowed to import inputs at international prices. Buying from the high cost domestic market has pushed up the costs of production, most companies have therefore tended to export disembodied technology in which they have been competitive thanks to a large pool of trained manpower available in the country. Indian investments have been mostly in light and intermediate capital goods rather than in consumer goods which require marketing skills or in complex capital goods which require high capital investments both for production and R&D.

Finally the recent orientation towards OECD countries and Nies and distance taken regarding Africa reminds that co-operation cannot be based on pure good-will. Mutual benefits also have to be secured as well as financial feasibility which implies a selective choice of partners or the intervention of a third party that is able to bring financial resources.

33 Brazil and Argentina: an attempt for bilateral co-operation between unequal partners

The Brazil-Argentinean arrangement of 1986 was one of the only concrete large-scale initiative to promote South-south co-operation in the 1980s. The principle was to develop a number of protocols in specific areas like agriculture, biotechnology and capital goods. The Asuciòn Treaty in March 1991 extended the scope of this arrangementand was a step towards MERCOSUR (1995).

It was clearly stated in the initial Brazil-Argentina treaty that trade expansion was conceived as an instrument for industrial restructuring and technological upgrading. The collaboration started in a period where both countries had to cope with several problems from external and fiscal imbalances to divergence with the US and other partners on numerous GATT issues regarding both trade and technology.

From the Argentinean perspective, Brazil represented an enormous market as well as a potential partner endowed with appreciable industrial and technological capacities. For Brazil, Argentina , despite its economic problems was like a natural partner. It had attributes that suggested initial complementarity: its agricultural and agro-industrial production for example was and still is highly competitive. Besides, it had a relative abundance of skilled labour including engineering and scientific personnel.

It appears that despite some difficulties due partly to the adversity of the economic picture of the two countries and to the lack of co-ordination in policy making, some progress in terms of trade expansion and composition have been made, and interesting developments have started to take place at the sectoral level notably in machine-tools, auto-parts and biotechnology.

Considering trade, Argentina seems to have benefited immediately from the integration process. It recorded a significant surplus vis-à-vis Brazil in 1989 for the first time in the decade. This is explained by the sharp increase in Argentine exports and a small reduction in imports from Brazil. By 1990, Brazil was absorbing 11,65 of Argentina's exports.

Table n° 7: Argentina-Brazil trade
(in current US$ millions)

Year	Argentina exports	Argentina imports	Balance	Total trade
1980	765.0	1072.3	-307.3	1837.3
1981	595.1	893.3	-298.2	1488.4
1982	567.7	687.7	-120.0	1255.4
1983	358.3	666.8	-308.5	1025.1
1984	478.2	831.2	-353.0	1309.4
1985	496.3	611.5	-115.2	1107.8
1986	698.1	691.3	6.8	1389.4
1987	539.3	819.2	-279.9	1358.5
1988	607.9	971.4	-363.5	1579.3
1989	1124.0	721.4	402.6	1845.4
1990	1421.6	717.9	703.7	2139.5

Source: Coopération Sud-Sud: perspectives générales. OCDE 1994

The sharp depreciation of the Argentine currency in 1989 explains partly the growth in exports to Brazil but the situation in 1990 and generally the new trends in bilateral trends are not only due to foreign exchange fluctuations. The sectoral negotiations, the recessionary conditions on the Argentina market and the steps taken in Brazil towards lifting export restriction are also explanatory factors.

It is important to precise that in mid-1989, 90 percent of the Argentine exports to Brazil were „negotiated" items whereas only 50 percent of the Brazilian exports to Argentina entered under similar conditions[6]. While most items have been negotiated through bilateral agreements under ALADI, special protocols have been in force for capital goods and processed food.

[6] Iglesias, political changes in Brazil and Argentinia between 1970 and 1989, 1991

Table 8: Composition from bilateral trade Argentina with Brazil

	Primary	Manufacture of agricultural origin	Oil	Manufactures of industrial origin	Total
Exports					
1985	176,7	146,9	63,5	109,0	496,0
1986	315,4	206,7	23,4	150,4	698,0
1987	218,2	113,1	0,1	207,8	539,0
1988	210,3	93,6	4,3	298,9	607,6
1989	346,2	259,6	18,0	499,1	1124,0
1990	560,4	305,8	5,7	550,1	1422,7
Imports					
1985	144,1	14,5	17,7	435,3	611,6
1986	166,4	26,3	0,3	497,8	690,2
1987	158,6	26,3	30,6	603,8	819,3
1988	135,7	58,6	50,4	726,6	971,3
1989	163,5	38,9	1,7	516,7	721,3
1990	155,9	45,0	9,3	506,4	717,9
Balance(for Argentina)					
1985	32,6	132,4	45,8	-326,3	-115,6
1986	149,0	180,4	23,1	-346,8	7,8
1987	59,6	86,8	-30,5	-396,0	-280,3
1988	74,6	35,0	-46,1	-427,7	-363,7
1989	182,7	220,7	16,3	-17,6	402,7
1990	99,5	260,8	-3,6	44,4	575,2

Source: Industry and Trade Secretariat, Argentina

The growing participation of industrial manufactures in Argentine exports is also a significant feature. Industrial manufactures have indeed grown from US$ 109 million in 1985 to US$ 560 million in 1990. Whereas the share of industrial manufacturing goods in Argentine exports increased from 18,4 per cent in 1985 to 33 per cent in 1989, it rose from 21 to 44 per cent as regarding exports to Brazil over the same period.

In 1990, the deficit in trade of industrial manufactures was transformed into a small surplus, suggesting that a pattern of intra-industry trade had started to emerge in some manufacturing items Nonetheless, it is important to point out that manufactures of agricultural origin (as well

as primary goods) reached records in 1990. More detailed studies determined that the main growth items in Argentine exports to Brazil aware dairy products, foundry, non electrical machinery, motor vehicles, prepared vegetables and fruits and plastic materials[7].

The protocol number one was intended to create a custom union in selected capital goods by addition every six months of new products to a common list. Some products are excluded are excluded of the protocol such as informatics and electronics which Brazil tends to protect.

Trade was to be balanced with specific clauses and the choice of the specific capital goods to be included in trade was to be compensated in each successive common list. From the Argentine point of view, this provision was extremely important since the country had always been a net importer of capital goods not only from Brazil but from the industrialised countries. Protocol number one thus gave Argentina an incentive to reduce its imports of capital goods from third countries with whom no mechanism existed to ensure an opening of their markets while at the same time increasing capital goods exports to Brazil.

In addition to the trade agreement, protocol number one included measures aimed at transforming the protocol into an industrial policy instrument. This included explicit statements regarding the gradual harmonisation of policies related to production and technological development in the capital goods sector. The underlying idea was to create a wider market allowing for economies of scope and specialisation that would lead to enhanced technological development and increased productivity. Determining complementarities at the horizontal level i.e. among finished goods and at the vertical level i.e. in the supply of parts and components was one of the priorities.

In the practice, the common lists have been defined according to the offers of the producers in each of the two countries. Since the producers have to approve the inclusion of the products on the common list, they were able to disrupt competition. Over the time, the producers have tended to be more defensive which lead the governments to adopt a more rigid position in order to revive the integration process.

Despite difficulties in negotiating and adverse economic situation, trade in negotiated items increased from US$ 17 millions in 1986 to US$ 95 million in 1989 and the balance moved from US-12,5 to US$ +7,5 in favour of Argentina.

However, during the two and a half years of negotiation of the protocol -launched in January of 1987-, a number of modifications were made to the original proposal. This would reduce the impact of the protocol on technological development and industrial structure.

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[7] Jaguaribe H, Argentina-Brazil Integration, 1991

In addition to the failed attempt of using the capital goods protocol as an instrument for technological development, the the Argentine-Brazilian arrangement included a number of innovation-driven initiatives. The most importance were in biotechnology, informatics, nuclear matters and aerospace.

Since the capital goods protocol eliminated the whole electronics industry, efforts centred around human resources and research and development have been made to enhance co-operation in the electronic sector. Concretely, the two Governments sponsored yearly academic meetings, the so-called „Argentine-Brazilian School of informatics". A number of scientific and technological meetings were held at the same time. About 500 students from Argentina and Brazil and 50 from other Latin American countries participated to each session. A common research programme was established partly as a result of the Schools. The programme was focused essentially on software engineering, design and production of integrated circuits, non-conventional architecture and artificial intelligence. The most significant research project was the ETHOS[8] project aimed at developing a workstation oriented to soft-ware engineering, involving not only academic institutions but also national manufacturing firms.

Beyond this however, little progress if any has been made in this programme due to the lack of funds and to domestic policy changes regarding informatics. In a number of cases, moreover, Argentine scientists connected to the bilateral research programmes have migrated to Brazil where working conditions looked better.

In contrast to the difficulties faced in informatics and despite the budget constraint in the two countries, some improvements have been made in finding a common position nuclear issues and in scientific and technological co-operation. A number of common projects have been initiated and a free trade agreement for nuclear equipment was signed as soon as 1990.

In aeronautics , a major project of co-production of a joint-plane for civilian use has been launched. While the design phase was embarked on very rapidly, the production stage has been delayed due to budget constraints in Argentina.

Thus, none of these mega-projects has happened to be achieved. Most of them indeed were interrupted in the initiation phase which leads to ask the money involved to start the projects was worth. Beside this, however, some micro-sectors reacted positively to the integration process. It is the case for example in the machine-tools, in the automobile and auto parts and in the biotechnology sector.

- Machine-tools:

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[8] Correa C, Tecnologia y dessarrollo de la informatica inn eel contexto Norte-Sur, 1989

Argentina and Brazil are among the small number of developing countries that have an indigenous production of machine-tools, including computerised numerically controlled machine tools.

The lack of competition among the numerous Brazilian machinery makers operating in a closed and protected though relatively large market favoured high mark ups which in some cases were used to finance expansion capacity. The excessive national integration of production combined with a high degree of diversification led to higher production costs than in Argentina added too frequent quality problems.

In comparison, Argentine machinery producers enjoyed the advantage of a less expensive skilled labour force and lower price of inputs. Argentine producers moreover started to compete in an innovating way by customising their products to the special needs of their clients and by offering before and after sales services. In the case of numerically controlled machine-tools for example, engineers from Argentine companies were sent to their Brazilian customers to examine in detail their machining operation requirements with of view of adapting their products. In addition training courses for using numerically controlled machine-tools were offered free of charge.

Some machine-tools makers have incorporated new capital equipment and have started to increase installed physical and technological capacity. A small virtuous circle of higher exports and production and growing capacity has started to take place. However, for most of Argentine producers, the Brazilian market has been a way of compensating the tremendous reduction in the domestic market potential.

Given the importance of the Brazilian market for number of Argentine producers, it is surprising that no joint-venture with Brazilian partners has been materialised. The four main reasons for that are the uncertain Brazilian macro-economic situation, the unequal size between Brazilian and Argentine firms (Argentine firms are rather small and medium enterprises, Brazilian companies are rather large), the lower costs of production in Argentina and the individualistic attitude of producers on both sides.

In summary, Argentine firms were able to take advantage of the niches available in the huge Brazilian market. This reduced the price of some machines, allowed the introduction of a more customised type of competition and led to capacity expansion. Innovation-driven elements appear to have played an important role in this context. However, as we have noticed, this has not induced the Argentine machine-tools makers to search for more substantive forms of co-operation with their Brazilian counterparts.

- Automobile and auto parts:

In 1991, as part of the protocol governing trade in automobile and auto-parts, 10000 (later 18000) finished cars were authorised to be exported by each country to its neighbour foe a total of US$ 200 million in finished cars and US$ 600 million in auto parts. Unlike the small machine-tools makers who were reluctant to enter into complementary activities with their Brazilian counterparts, the automobile sector have shown an ample reaction mainly trough transitional companies.

Thus in 1987, as negotiations for an automobile protocol went underway, Ford and Volkswagen decided to merge their operation in Brazil and Argentina and constitute a new company called Autolatina. At the same time, both SEVEL (the Argentine company in which Fiat holds a minority share and provides management and technology) and the Argentine affiliate of Mercedes-Benz have established a complementation programme with the Brazilian counterparts. In 1991, the Argentine affiliate of Renault which had been reluctant until there finally concluded an agreement with Volvo Brazil.

Low skilled labour costs and a good mechanical tradition have facilitated the specialisation of Argentina in manufacture of complex parts for both Argentine and Brazilian markets. For the subsidiaries operating in brazil , imports of Argentine auto parts are a mean of reducing costs. It is thus understandable that the delays in putting in practice the automobile protocol were mainly due to Brazilian independent auto parts makers.

The emerging pattern of specialisation in Argentina and Brazil seems quite different from the ASEAN complementation scheme we have analysed above. In contrast with ASEAN indeed, a very important and integrated automobile production with south-America had already existed in Brazil. Hence any regionally strategy depends basically on the restructuring of the auto industry in a country where traditional non-Japanese subsidiaries had been operating before: it does not depend only on the policies adapted by the Brazilian government but also the strategies pursued by both existing and potential newcomers.

- Biotechnology:

In protocol number nine, an Argentine-Brazilian Biotechnological Centre, the Centro Argentino Brasileño de Biotecnologia (CABBIO) was created to foster collaborative research projects to be undertaken by universities, public research institutions and private firms on matters of common interest for both countries. Human resources were to be developed though the Argentine-Brazilian School in biotechnology.

The initial project stated that each country would provide a total of US$ 10 million over a period of five years to finance CABBIO. However, Argentina allocated only about US$ 1.5 million and Brazil slightly over US$ 2 million.

In addition to the fact that the actual resources available to CABBIO have fallen far below the original expectations, it has become clear that that the Argentine government have been giving a lower priority to the joint-venture. The Argentine contribution of US$ 478000 in 1987-88 fell to a low US$ 42000 in 1988-89. At the end 1989, the Centre was virtually closed. With great effort of the direction, the centre was given additional resources in 1991 but it means of action and activities have been very modest in comparison with the planned project.

The main purpose of CABBIO was to finance joint-research programmes on selected matters. Eight of the initially nineteen projects have been started by 1991. Evaluation undertaken by the research steering committee had been positive and one of the projects had been transferred to the private sector. However it appeared that legal problems related to the technology property had been underestimated and had to be resolved.

Concerning human resources endowment, in addition to a meeting organised in April 1988 in Curutiba where more than a hundred of students from both countries attended lectures from both argentine and Brazilian experts, the Biotechnology School have been organising yearly courses. A system of scholarship has also been put on place to allow 10 to 20 student to attend courses in each others country each year. these courses seemed to have been useful to providing training to the graduates and to facilitate further co-operation.

The research communities in both countries seem to have been pleased by the actual and especially potential opportunities offered by the on-going co-operation but they also critic the limited financial supports granted to the process and fear further reduction of the allocations.

At the private sector level, the research projects have been received with scepticism in reason of the lack of reliability of the Centre. For example. Biotica, an Argentine company Agroceres, the leading Brazilian seed company had established the company Biocedes to develop high quality potato seeds for both market. The project was initially supported by the Centre. However , the funding was ultimately discontinued which obliged the actors to search for alternative resources which they fortunately found. It appears beside that the private sector resources allocated to R&D had been much superior to the public CABBIO budget.

In conclusion, it is clear that at least from the Argentine side , significant advantages in terms of trade expansion have been obtained through integration. Industrial complementation has also been achieved. Meanwhile, in terms of real co-operation, it appeared that good will does not compensate the lack of financial support.

The significant evolution at certain micro-levels are not sufficient to qualify the first phase of integration as a success. It also does not support the view that co-operation will simply flow from just liberalising trade and restructuring industry.

Integration has been processed differently from 1992, basically through general trade preferences. Following the observed failures, technology and industrial issues have hardly been on the agenda. Under these conditions, the probability of making further progress in industrial and technical co-operation seem limited. the future of this sub-regional integration will however largely depend on how key actors react to the general incentives provided by the involving macro-economic environment, the trade and industrial policies in Brazil and Argentine, the sectoral agreements and the evolution of the MERCOSUR.

Despite the fact that the general orientation in Argentina and Brazil does not provide many grounds for expecting the emergence of new innovation-driven south-south co-operation forms, the changing conditions at both the internal and international level poses a challenge to the imagination of all relevant public and private actors.

34 The African continent: the failing linkage with the private sector

Though the pace of progress might be slower than elsewhere and despite the shrinking resources available to African governments in the 1980s, technological accumulation is taking place in Africa as well. It involves mainly public sector institutions and universities. Private enterprises have indeed been somewhat set back.

The specificity of the African private sector is the importance of its informal proportion which has expanded as devaluations and shortage of foreign exchange made imports spare of parts for industry and transportation more difficult.

As example can be given the Suame Magazine, a grouping of some 5000 craftsmen in small garages and workshops started in 1989 and making spare parts and repairing vehicles in Kumasi, Ghana[9]. The particular interest of the Suame magazine is not however that local mechanics have been developing their manufacturing skills but that the governments have been supporting this indigenous engineers through technology services, training and credits. These include government funding for the Intermediate Technology Unit of the Technology Centre at the University of Science and Technology in Kumasi and an extension of the training unit concept throughout the country via the Ghana Regional Appropriate Technology Industrial Services which provide on site training in product development. In addition, the government has been providing training to improve the skills of mechanics in informal workshops and to teach them basic accounting and management methods. It has also helped to establish a pilot programme to provide credit to small operators such as mechanics co-operative established to purchase and share equipment. This type of approach has to be generalised.

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[9] Jeune Afrique, March 1991 and Business Africa June 1991

In alternative sectors however, technical capabilities are mainly accumulating in public research institutions supported by local governments and donor countries. The International Institute for Scientific Development of Africa (IISDA) for example is a newly established centre in Côte d'Ivoire supported by Canada, France and the Ivories government. Its current research programme is focused on the improvement of yam varieties and on the treatment of malaria. With regard to the former, close collaboration is foreseen with International Institute for Tropical Agriculture in Nigeria, which is already active in tissue culture for germplasm conservation and in the *in-vitro* distribution of disease-free planting material for yams and other crops. Biotechnology research is also developing in Ethiopia, where the Plant Genetic Resources Centre currently co-ordinates the Genetic Resources Network of the African Ministerial Conference on Environment (AMCEN).

Unfortunately, however, it seems that few linkages have been established between these research activities and production. The contribution of research to innovation has thus remained limited. As these example demonstrate, there is a critical need for states and international institutions to refocus their attention on measures to promote a culture of innovation in Africa and on the national, regional and international linkages to sustain it.

4 Concluding remarks: the importance of innovation and networking

41 Putting participants into the process

One cannot legislate that trade liberalisation without additional support is sufficient to generate international co-operation. The analysis of export-driven models of integration show indeed that trade does not necessarily follow the signature of preferential trade agreements. The reverse process might also occur. In the MERCOSUR and in ASEAN, for example, multinational corporations moved towards specialisation and exchange in automobile, autoparts and components either prior to or in the absence of preferential trade agreements. India has not established any arrangements of this type. The way in which various actors and interests combine to support or constrain integration efforts explains such paradoxical phenomena. A focus on the interplay between state and other social and economic actors also makes it possible to understand why the development of ASEAN regional linkages beginning to accelerate only now, after two decades of successful of national-economic growth. Moreover it appears that government-to-government policies need the commitment of private-sector to be effective.

In the case of Argentine-Brazil integration initiative of 1986, public announcement of the agreements came as a surprise and their signature was not preceded by debate in either country which did not generate a favourable reaction of the private sector. Competitiveness is however a function of organisational changes that involve more linkages between clients and suppliers, collaboration between firms in R&D, production and marketing and networks between producers and the scientific and technological infrastructure not of governmental agreements.

While institutions building remains important, there is a pressing need to innovate in the new forms of regional integration and south-south co-operation. An alternative to the traditional state-centric view that would bring participants more meaningfully into the process of regional co-operation is needed.

42 Recentring south-south co-operation on innovation

In parallel to the need to reshape the structures of south-south co-operation, there is a need to enlarge and refocus their content. The directions that might be taken have to take into account the observations concerning the growing knowledge-intensity of production and the role of innovation in international competition. From this perspective, modernisation and competitiveness does not mean narrowly specialised mass production forms of industrialisation any more. Nor is development conceived solely as a process of moving away from raw materials production to manufacturing. On the contrary, new technologies are today capable of

upgrading all economic activities and not only the high technology sector. It is now necessary to reconsider resource-based knowledge-intensive development.

The monofocal approach of commodities must be abandoned. Simple commodities, like sugar or vanilla for example must be reconceptualised as potentially complex products with multiple end uses. This significantly enlarges the range of stages in the value chain to which new technologies can be applied and it enhances the prospects for co-operative south-south initiative.

Networking must become central to the process of regional co-operation in order to strengthen the ability of developing countries to adjust to continuous changes in international tastes, prices and competitive conditions. Although such linkages begin at home, increasing ties must also be forged across national borders, across the south because of common approaches but also between north and south especially in the dynamically evolving sectors such as electronics.

Developing innovation-driven forms of south-south co-operation is more realistic in the 1990s than in the past for two important reasons. First, the need for pooling resources has become evident to most countries and other economic and social actors in the south. Second, technological accumulation within Asian and Latin American public and private sector enterprises, research institutions and universities has progressed in a wide variety of sectors, including the resource industries, electronics, machine tools, auto parts and biotechnology.

43 Supportive role of states and international organisations

There is no doubt that the maintaining of an innovation-driven model of south-south co-operation will require the maintenance and in some instances the strengthening of north-south ties, since much of the technology on which such innovation are based might originate from the north. To the extent that these ties involve in an effective transfer of technology . north-south co-operation could provide the externalities that make gains from south-south co-operation more likely. For this to take place, however, these ties must be complemented by increased attention on the learning and dissemination of internationally available know-how which has not been sufficiently exploited in the past. It is at this point that local governments and non-governmental institutions have a critical role to play in stimulating the demand for innovation in all sectors and catalysing the creation of linkages between suppliers and users located in the domestic productive system and in the local science and technology infra-structure. Such efforts, moreover, are complementary to regional networking for innovation. UNIDO has directed many efforts in this direction by supporting the regionalisation of the so-called Technological Information Exchange System (TIES). Examples are the implementation of the Sistemo Andino de Informaciòn Technològica (SAIT), the Asian TIES network and African TIES network.

By the early 1990's donors had come to recognise the need to strengthen the ability of developing countries to respond to changing international competitive conditions by developing human resources. Both the United Nations General Assembly resolution 45/145 of December 1991 and UNIDO's medium term plan for the years 1990-95 emphasise the importance of promoting regional activities of co-operation among developing countries. the High Level Committee on economic and Technical Co-operation in May of 1995 reitered the principle and proposed measures. Various donor agencies have also supported meetings among members of the business community from West African countries and between private and public sector actors in Southern and Eastern Africa. However, much more needs to be done and it needs to be oriented towards the promotion of innovation.

A look at two Latin American programmes and relation between them provides an example of the many different roles that donor countries have begun to play in promoting innovation-driven models of south-south co-operation. The first, the Centro de Gestion Tecnològica Insdustrial (CEGESTI) in Costa Rica, funded by UNIDO and UNDP was designed to provide training, technological information and management consulting needed to stimulate small-and-medium enterprises to think strategically and to incorporate innovation into their growth strategies. The CEGESTI model has already been diffused in other Latin American countries. The second, the Simon Bolivar Programme is an eight-country initiative modelled after the European Eureka programme. Its two main objectives are to promote innovation in the region by stimulating greater interaction between local research institutions and the private sector, and to promote regional integration by facilitating the establishment of partnerships between enterprises and research institutes in two or more countries.

CEGESTI's training programme focuses on educating firms in initiating changes through the creation of small experiments that operate as laboratories for apprenticeship. As a part of a Costa Rican programme to foster initiative behaviour in small and medium enterprises. nine enterprises where chosen from different sectors with the intention of strengthening the firm's innovation capacity. For this purpose, CEGESTI trained nuclei of two industrial engineers in technology management who worked as advisers for the managing directors of each company. This nuclei have been in place for more than two years over which they have been developing pre-investment projects. In addition to identifying potential innovation projects within the firm, they have been responsible for establishing linkages with local universities and managing the ensuing R&D projects. The directors of the participating firms all agree that the impact of the programme has been positively felt in the following areas:

- sales volumes
- productivity
- development of new products and activities
- development of new markets

All concerned companies have an interest in hiring their advisers at the end of the contract period.

By its design, CEGESTI's programme has not only induced firms to innovate but it has also laid the ground work for strategic partnership among these firms and between firms and research institutions in both the domestic and the wider Latin-American environment.

Establishment of the Simon Bolivar Programme has given impetus to the creation of R&D partnerships across the continent. In March 1992, the programme was given further encouragement when the inter-American Development bank made US$ 4.3 million available to it in form of technical co-operation grants. An additional US$ 3 million was contributed by the member governments. This US$ 7.2 million budget is expected to cover the set up and operating costs of a regional network of national- co-ordinating committees and a lightly-staffed secretariat which has yet been established in Caracas.

Financial support however is not the only form of support that donors are giving to this programme. The Direction General number 12 of the European Communities, working with the current Eureka presidency is supporting a training programme for national co-ordinators who will be the principal agents for partner identification, project evaluation and funding in the Simon Bolivar Programme.

In sum, in a period of rapid and intense technological change, breaking with traditional theory and practice concerning the form and function of south-south co-operation is essential. Accent has to be made on innovation-driven model which have been demonstrated to be feasible through the numerous examples of firm-to-firm, university-industry and government-to-government arrangement underway. To strengthen these initiatives, states will be increasingly be called upon to play a key role though the private sector's contribution and active participation increases. Policies that promote innovation and technological diffusion, an institutional and legal framework that allows and fosters networking for innovation as well as the telecommunication, transportation, research and training infrastructure which support them must be put in place. Creative solutions for the financing of innovation must also be developed. The agenda for south-south co-operation is thus long, but it is realisable if it remains firmly focused on the goal of networking for innovation.