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**TOWARDS A NEW
INDUSTRIAL STRATEGY FOR
VIET NAM**

This report was prepared by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division.

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PREFACE

Since early 1988, UNIDO has provided analytical inputs and policy advisory services to the Vietnamese Government in the context of the country's economic strategy renewal.

First, an initial assessment was undertaken of the country's industrial performance, major constraints and prospects. The findings and recommendations of this study were issued in a document entitled "Viet Nam's Industrial Development - An Assessment" (PPD/R.28, 24 August 1989). Upon request of the Government, a number of specific brief papers were subsequently prepared by UNIDO, including:

- The Textile and Clothing Industry in Viet Nam: A Filière Approach (July 1990);
- The Economic and Industrial Structure of Viet Nam (May 1990);
- Downstream Options in the Oil Industry for Viet Nam (May 1990);
- Development and Diversification of Rural Industrial Activities in Developing Countries: Lessons for Viet Nam (May 1990).

On the basis of these reports a National Seminar on Viet Nam's Future Industrial Development was organized by the State Planning Committee and UNIDO in Hanoi, 11-12 October 1990. The objectives of this Seminar were (i) to enable a feed-back from a wide range of Vietnamese authorities, institutions and industries on the UNIDO findings; (ii) to ascertain the views of the various government authorities and selected private industrial entities in Viet Nam on current constraints to industrial development; and (iii) to arrive at a common understanding of strategic issues, policy approaches and institutional measures to overcome these constraints and thus establish a basis for the work on the formulation of a new industrial strategy. For this purpose, UNDP also provided a contribution focusing on policy issues, "Review of Project Reports on Industrial Development in Viet Nam", by UNDP consultant Prof. Seonjae Yu.

The Seminar was attended by more than one hundred Vietnamese officials and industrialists, representatives of UNDP and UNIDO staff and experts. The full list of participants is contained in Annex I. The programme of the Seminar included brief presentations from the side of UNIDO of the various reports so far prepared and some twenty detailed statements by Vietnamese participants. The list of Vietnamese statements is presented in Annex II.

The deliberations were frank and constructive. A clear convergence emerged about the major problems which the industrial sector is currently encountering and about the need for setting the course for a far-reaching restructuring of the industrial sector. It was noted that this restructuring process required full involvement of all actors and decision-makers concerned in Viet Nam, i.e. the various ministries and other authorities at national and provincial levels, the banking sector, the scientific and technological sector and certainly the public, co-operative and private industrial enterprises in all parts of the country. Only through concerted action and consistent measures would it be possible to move ahead with the difficult task to

restructure and modernize industry and reassume industrial growth in Viet Nam in a complex international economic environment.

Against this recognition of the need to synchronize efforts and eventually to launch a new industrial strategy for the country, it was suggested that the background documentation and the deliberations of the Seminar be consolidated into one single report which would be widely disseminated in the country. The present report thus provides a summary account of the main findings contained in the above-mentioned UNIDO and UNDP reports and reflects the major comments made during the National Seminar. It is hoped that it will serve as a catalyst for further discussions and thinking about the future of manufacturing development in Viet Nam. It will have served this purpose if it has helped to initiate analyses which further clarify the present situation in the sector and formulation of policies, measures and concrete projects which will allow the manufacturing sector to tackle the many challenges that lie ahead. Guiding these activities will be one major task for the State Planning Committee. UNIDO is ready to make its expertise available to support the Committee in carrying out this task.

The individual papers and documents which formed the basis for this report are also available in full to interested readers. The list of documents is contained in Annex III.

PART I

THE NATIONAL SEMINAR ON INDUSTRIAL DEVELOPMENT - SYNTHESIS OF PRESENTATIONS

1. Opening Session

In the Opening Session, the key issues now confronting Vietnamese policy-makers were outlined and the framework for the ensuing discussions was established.

In his opening statement, the Vice-Chairman of the Council of Ministers pointed out that, while the long war had been an enormous burden on the economy and had effectively blocked development, ill-conceived economic strategies and economic management practices had also contributed to the country's problems. He pointed out that to overcome the economic difficulties, to improve the living standards of the Vietnamese people and to achieve better integration with the international economy, Viet Nam had made major efforts since 1986 to initiate "an all-sided process of renewal". It was fully understood that this unprecedented undertaking required dynamism and creativeness in all economic sectors, in the administration and of the entire people. Viet Nam was thus in the process of elaborating socio-economic development strategies aimed at bringing into full play the potentialities of the country and people. In this process, there was a need to learn from experiences of success and failure of other countries. International co-operation provided by UN organizations was essential in this respect. With regard to the industrial sector, UNIDO's previous analytical work and technical support constituted a good example, and follow-up activities would be highly valuable for future industrial development.

The Vice-Chairman of the State Planning Committee, in his opening statement, concurred with these views. Moreover, he pointed to the importance of understanding the basic concepts with regard to industrial strategies, support policies, cost-accounting and market-orientation outlined in the reports submitted. He also underlined the importance of an assessment of the findings and recommendations contained in the reports based on the actual, present day experience of Vietnamese policy-makers and businessmen. Finally, he drew attention to the issue of foreign investment, which should play a more prominent role in the future development of Viet Nam's manufacturing sector.

After the opening session, the Seminar went on to discuss the reports submitted by UNIDO and UNDP. The following sections contain, first, a summary of the main issues singled out by the UNIDO team in presenting their reports, and, second, the key issues as perceived by the Vietnamese participants, and their major comments on the UNIDO/UNDP reports.

2. Key issues: UNIDO comments

The UNIDO delegation stressed that the transition from a centrally planned to a (more) market-oriented economy was obviously a highly complex issue. The formulation of industrial strategies and policies as part of a major transformation and deregulation process in a country usually followed two ways. One was to identify and apply the "standard" set of policies and institutional measures of market economies including the framework for a

functioning price system and international trade. The other was to review the specific pattern and model of past industrial development of the countries which have successfully built-up an efficient and competitive industrial structure with a view to emulating their experience in terms of strategies and policies.

Also in the case of Viet Nam, the UNIDO delegation emphasized, lessons could certainly be drawn from other countries' experience, but there were great problems in simply applying them. Although the macro policies and "standard" instruments for a well-functioning market economy system were well known, the transition from a command economy to a more market-oriented system could hardly rely on any "success stories" of other countries. Such process of transition involved fundamental changes of policies, institution and decision-making systems. It needed to be designed and carried out in a gradual and consistent way so that price and trade policy reforms, regulation of company management/ownership, changes of investment rules, etc. created minimal distortion and social costs. No secure timetable of reforms existed and the particular condition prevailing in Viet Nam seemed in any case to warrant special fine-tuning of reform measures. Moreover, the international economic environment had undergone and was still undergoing such drastic changes that historic patterns of industrial growth may not necessarily serve as a guidance for the current period of time, especially for latecomers in industrialization.

The formulation of an industrial strategy for Viet Nam would need to be based on a close monitoring of current international trends, a realistic assessment of international competition and on detailed analyses of the performance of the domestic economy, specifically the manufacturing sector and its major subsectors. Since key parameters were subject to a continuous change, it was not possible to establish a once-for-all blueprint of a strategy. Any industrialization strategy formulation would thus be a continuous, iterative process.

In presentations made by UNIDO experts, it was stressed that the development of the world economy in the 1990s was hard to predict: the increasing economic unification of EEC countries, the breakdown of central economic planning in Eastern Europe and the conflicts in the Middle East were likely to have a major impact, but the extent and direction of this impact was unknown. It was appropriate, therefore, to discuss possible future developments in terms of various scenarios.¹

The main scenario, according to the UNIDO experts, would appear to be a tendency towards increased (intra-) regional trade liberalization throughout the 1990s, as an outcome of present developments and the implementation of major international agreements that are in the making (such as the European Common Market). The best case scenario assumed that the GATT negotiation could still be brought to a successful conclusion, resulting in increased global trade liberalization. The worst case scenario was one where intra-regional liberalization is combined with increased protectionism between the trading blocs. This could still generate a better outcome than the development in the 70s and early 80s, provided that the degree of interregional protectionism was not higher than found in that period.

¹ The scenarios are summarized in Graph 1, annexed to this chapter.

Should global liberalization continue, then Asia in general and also Viet Nam was likely to benefit considerably. Even in the worst-case scenario, there was still some reason for optimism as Japan might be looking at Viet Nam as one new source of oil supplies to secure its energy requirements from regional sources.

According to the UNIDO experts, it was clear that, whatever the outcome, countries must increasingly look beyond their own boundaries. There was an important lesson for Viet Nam here: The country must accelerate the integration of its economy with its neighbours in order to capture the larger gains from participating in the international division of labour.

This was all the more important when considering what was happening simultaneously with Viet Nam's main trading partners in Eastern Europe. After their market reforms, and reinforced by the various lending and trading concessions given by the EC and EFTA, they would redirect their trade towards the market economies. Viet Nam was thus losing its major export markets and suppliers. However, to the extent that Viet Nam supplied East European industries which were successful in exporting to market economies, implemented its own market reforms and adjusted its companies, Viet Nam could become price and quality competitive in Eastern Europe for certain raw materials and intermediary products.

As UNIDO's experts saw it, the main question to be tackled by the Vietnamese policy-makers was the identification of policy measures which could direct and support industrial restructuring towards internationally more competitive structures, whether this took the form of a low-cost strategy or a high value strategy, or a mix of these.

The following questions were seen as critical ones to be addressed in this context:

- What industries can be expected to have comparative advantages in Viet Nam after the necessary market reforms?
- Where will, as a consequence, export surpluses arise and which industries will primarily become import-competing?

It was emphasized that in an economy liberalizing its trade the net exporting industries were likely to be among those that are already strong. In an open economy, however, all industries that are exposed to foreign competition must be competitive themselves to survive. This was true for both the exporting companies and for those which exclusively deliver to the home market yet in competition with imports. Following from this, production technology needed to be adapted to the international standards of other developing, but already opened countries. Technology and thus the factor proportions of Vietnamese industries did not reflect these standards very well now. The whole range of industries could therefore be expected to need a period of technological adaptation as part of the process of developing a competitive industry and a competitive industrial structure.

To evaluate future prospects for different industries on the basis of their present factor proportions and relative costs would, in consequence, be dangerous. Besides, there were two other considerations to be taken into account:

- linkages that may lower the costs of entry to a particular branch of industry;
- other technological or market based costs of entry to an industry for a "newcomer" on the world market like Viet Nam.

The outstanding feature of Viet Nam in an international comparison was its abundant unskilled labour force. This created comparatively low costs for all industries that are unskilled labour intensive.¹

The pressure for employment, the sizeable domestic demand and the internationally competitive wage levels would call for a quick deregulation in and an expansion of - in particular - the food, clothing and textile industries. These industries could absorb much of the labour reserve.

The food, textile and clothing industries were seen to have a large and growing domestic market. The quality of the products was on the whole not very high, however, and in order to cope with increasing competitive pressure from imports, this issue should be given attention urgently. The clothing branch was already a considerable foreign exchange earner, and - in spite of quota obstacles etc. - could increase its earnings if more attention was paid to qualitative aspects, rapidly changing consumer preferences, etc. Such measures could also help to secure entry for certain segments of the food industry in international markets. The export potential for textiles did not appear to be large at this stage as the raw material base was still not sufficiently developed, and technologies were on the whole not up to world standards yet more scope was seen to exist in the longer term.

The UNIDO experts were of the opinion that in the longer run, great potential exists for the skill-intensive (non-electrical) engineering industry. This industry was already quite large and could expand to meet growing demand in the domestic market, supplying other sectors and various industrial subsectors with - first - simple equipment and spare parts. With experience gained and with the adoption of foreign technologies further development in various product groups could be envisaged. Sophisticated products would need a longer time, during which domestic R&D capability would have to be built up and/or more systematically utilized; assembly and repair of electronic goods could be a starting point for further developments in the R&D-intensive area. The resolution of conflicts in the sub-region would release a large number of skilled workers from the armed forces. Although some re-training (and continuous follow-up training) was needed, this would be of major importance for realizing the potential in skill-intensive industries.

Viet Nam's large capital-intensive industries, which had been at the core of earlier industrialization policies, were seen - on the whole - to play a less important role than before. Their performance had declined and their products seemed not competitive in international markets. They may thus not even be able to supply many of the capital goods needed for Viet Nam's own future manufacturing development as the sector was facing increased

¹ Graph 2, annexed to this chapter, roughly shows the likely relative position of the various types of industry (unskilled labour-intensive, skilled labour-intensive, capital and R&D-intensive) in the future development of the manufacturing sector.

international competitive pressures both at home and abroad and therefore needs to have highly competitive equipment. The scope for rehabilitation and modernization of selected, potentially viable existing heavy industry plants would in any case need to be analyzed in detail. The petroleum industry could be an exception in this context, given possible regional demand.

To cope with the various development challenges and to exploit the development potential, a number of serious obstacles would have to be removed at the company level. The main constraints were inefficiency of production organization and outdated production processes and equipment. The pricing of inputs and output, moreover, did not reflect scarcities or actual costs. Accounting systems and marketing seemed to be weak in most enterprises. Furthermore, low output of basic food processing industries and of equipment for the agricultural sector contributed to supply gaps in certain food products, causing inadequate nutrition levels of the population which, in turn, had negative effects on labour productivity.

In the presentations, the negative impact of past economic policies was emphasized. State monopolies in a protected market had in the past hindered price and quality competition. Under the command economy system, with Government administration as sole decision-makers, there had been few inducements for industrial companies' management to efficiently use inputs and source equipment. Low producer prices in agriculture were a disincentive for raw material production, and the supply of raw materials to factories was further worsened by a badly functioning transport and distribution system. Finally, essential production goods could often not be imported because of the scarcity of foreign exchange and the lack of an economically rational system for its allocation, contributing to low capacity utilization rates in factories.

With the gradual reform of economic and industrial policies, a start had been made to break this vicious circle of stagnation and to lay the basis for new economic growth. The industrial sector could be a vehicle for spreading efficiency and dynamism throughout the economy. This would necessitate changes not only at the company level, but also at the branch, subsector and industry sector level. The relationship between the Government and the production units in the sector would have to be redefined. Some steps had already been taken in this direction, giving greater autonomy to enterprises, but as Viet Nam was becoming more closely involved in a world economy which remains subject to vast uncertainties and cyclical change, an overall strategy would be needed to ensure longer-term, balanced growth in the manufacturing sector.

To this end, first a detailed and comprehensive analysis of the manufacturing sector would have to be undertaken. This analysis, assessing the prospects of and constraints to industrial development in the current situation and in a medium-term perspective, would examine the present and future role of the manufacturing sector in the overall economic development process. Major characteristics of the current structure of industry would have to be determined in terms of performance, competitiveness and prospects.

Second, a number of priority areas would have to be identified. On the basis of the analysis above, industries which seemed to offer the best opportunities for further growth in the medium-term perspective could be singled out and policies formulated to ensure that the country's scarce

financial and human resources be allocated on the basis of economic criteria within a decentralized decision making system.

Third, an integrated strategy approach, the so-called "filière" approach, could be applied. This approach entailed utilizing specific production chains of interdependent activities which cut across a number of industrial subsectors and other sectors to build up mutually supporting inter-linkages of growth. It needed to be realized that the low present levels of inter-linkages among economic activities, was also a consequence of low overall development levels. The application of a filière approach may serve as a guide to a higher growth path based on integrated linkage effects. It was important to note though, that inter-linking the various industrial activities does not mean that a new autarky model be pursued but that also the prospects for foreign inputs and exports be evaluated at each stage of the production chain.

The UNIDO experts finally stressed that the rapidly changing international economic environment required a strategy that was flexible and multi-dimensional as a guidance for decision-making. It needed to be formed - and adjusted, when necessary - to reflect a mix of goals and assumptions and the perception and views of the various actors involved in the industrialization process. Multi-dimensional meant that policy-makers should avoid choosing one simplistic approach of development such as either export-orientation, import-substitution or employment creation. Instead these categories must be seen as elements in a broader strategy mix.

3. Key issues: Comments by Vietnamese participants

The main purpose of the National Seminar was to obtain reactions from Vietnamese decision makers and representatives of various industries to the studies and policy proposals submitted by UNIDO. The great number and high quality of the papers submitted by the Vietnamese participants were proof of widespread, serious interest in the issues being reviewed. It was important to find that Vietnamese active in the field confirmed many of the findings and supported many of the policy proposals. Even more important, however, were the new and different viewpoints and the additional suggestions formulated by the Vietnamese participants, which helped to bring the discussion on future strategies for the manufacturing sector another step forward. This section will focus on these specific contributions to the discussion.¹

While the failures of past industrialization policies were recognized by the Vietnamese participants, it was also pointed out that the historical reasons for the present situation should not be ignored. Structures and attitudes which had existed so long would take a long time to change: the highly centralized approach to development had spawned strong particularization among ministries, local authorities, etc.; the bureaucracy had worked slowly and circuitously for many years. There had been decades of separate development in the South and North. These historical complications would have to be taken serious, and would partly determine the time horizon for successful changes in the economy. Co-ordinated, fast policy-making and implementation had to be learned.

¹ Where possible, new factual information presented has been incorporated in the analysis in Part II of this document.

With regard to the analysis of the present state of manufacturing, it was pointed out that this would have to take place on a much larger scale to support future policy-making - especially with regard to leading subsectors such as agro-industries, textiles and engineering. What had also been lacking so far was an up-to-date analysis of the development of private enterprise. If this sector was to play a leading role in future industrial development, then its potential and the obstacles to growth had to be fully understood, as well as the present and emerging relationship with the public sector and the Government.

It should also be remembered that a rapid, unprecedented process of liberalization was taking place (although a full market economy was not envisaged - a mixed economy seemed to be favoured by the majority). Especially small and medium industries (SMI) were adapting very rapidly to the changing situation, with many small private enterprises being set up with private earnings. Analysis should therefore not only be more extensive - ways should also be found to continuously provide up-to-date information to entrepreneurs and relevant Government Authorities.

Opinions differed on the degree to which liberalization had actually taken place and had influenced manufacturing performance. It had obviously contributed to an upswing in recent years; plant management (especially outside the public sector) had been given far greater freedom; foreign investment was being encouraged (EPZs were being considered, for example, in Haiphong, Da Nang and Ho Chi Minh City). A report on the achievement of liberalization in the past few years which had been announced by the State Planning Committee would be most welcome in this context.

But it was only logical that the liberalization measures that had been promulgated took time to make an impact, and for the bureaucracy to change its ways of working. Moreover, the country was "feeling its way" to a market-oriented economy, and consequently legislation still needed much adaptation. Such a transitional situation inevitably was leading to complications and would imply a "wait and see" attitude among foreign investors. This pointed to the great need to strive for as coherent a reform policy package as possible, which was part of an overall long-term strategy. Preferably, such a strategy should coincide with the new (1991-1995) Five-Year Plan and should be based upon essential socio-economic goals of industrialization. For this purpose, the forecasts presented by UNIDO would have to be refined, and the many suggestions for policies and projects be reduced to viable essentials to correspond more closely with the actual situation and the present development potential. This again tied in with the need for more extensive background studies.

In the context of strategy formulation the filière approach was considered a useful tool, but there was some concern that it would prove to be complicated to apply - the more so as the present complex transitional situation was already imposing a great strain on policy-makers and the limited resources of qualified manpower in planning units, etc. Assistance in the preparation of analyses and measures, and in the co-ordinated execution of the latter would therefore be essential.

With regard to the major subsectors, it was felt by the Vietnamese participants that assistance was needed to identify future spearhead industries, the task being such a complex one under the present fluid domestic and world market conditions.

For textiles, doubts were voiced with regard to the possibility of strongly improving the raw material situation in the short- to medium-term - the competition for arable land between cotton and other crops, for example, was extremely strong, and a major increase in per hectare yields would need much time and many resources.

In the clothing industry, quality issues were seen by some as being just as important for the domestic as for the export market, if domestic market shares were to be retained vis-à-vis imports. If competition was already such a problem domestically, how was Viet Nam to face competition in export markets. Joint ventures with foreign participation would probably have to play an essential role in this context, the foreign partners providing a.o. expertise with regard to quality. A number of relatively small joint ventures (average investment less than US \$500,000) were already proving successful.

The engineering industry's role as a provider of industrial equipment and services to other manufacturing branches was emphasized - it merited special attention and support. More study would be required to bring out its pivotal role in this respect, and to formulate appropriate measures. Agro-engineering and shipbuilding were mentioned as two industries with a large growth potential in this branch.

With regard to the development of the food industry, it was expected that raw material shortages would delay its growth - earlier projections for agricultural output had evidently been too optimistic. The range of the industry's products could be expanded beyond what had been suggested by UNIDO. But a system of market analysis would have to be built up in order to improve the planning of industrial crop growing.

It was further pointed out that the Swedish development agency SIDA had been involved on a fairly large scale in rehabilitation in food processing - the experience deserved to be summed up and used as a basis for further work in the subsector. Rehabilitation being not just technical improvements, but an "all-in" approach, more outside support would be essential in these efforts.

In the context of discussions on the food industry, the issue of public versus private ownership was brought up. Privatization must not be seen as an across-the-board solution to the problems of the manufacturing sector. In contrast to trade activities and small-scale industries (SSI), there was little entrepreneurial tradition in Viet Nam in, for example, the field of large-scale food processing, and this would take a long time to create. Meanwhile, it would be better to retain viable public enterprises, and improve their performance.

Another problem was that in their present state many public enterprises would not as such be attractive to investors - these might mainly be interested in the sites and the infrastructure. In such a case, turning over enterprises to private owners would mainly result in de-industrialization. This would be another argument for retaining plants in the public sector and trying to improve their performance.

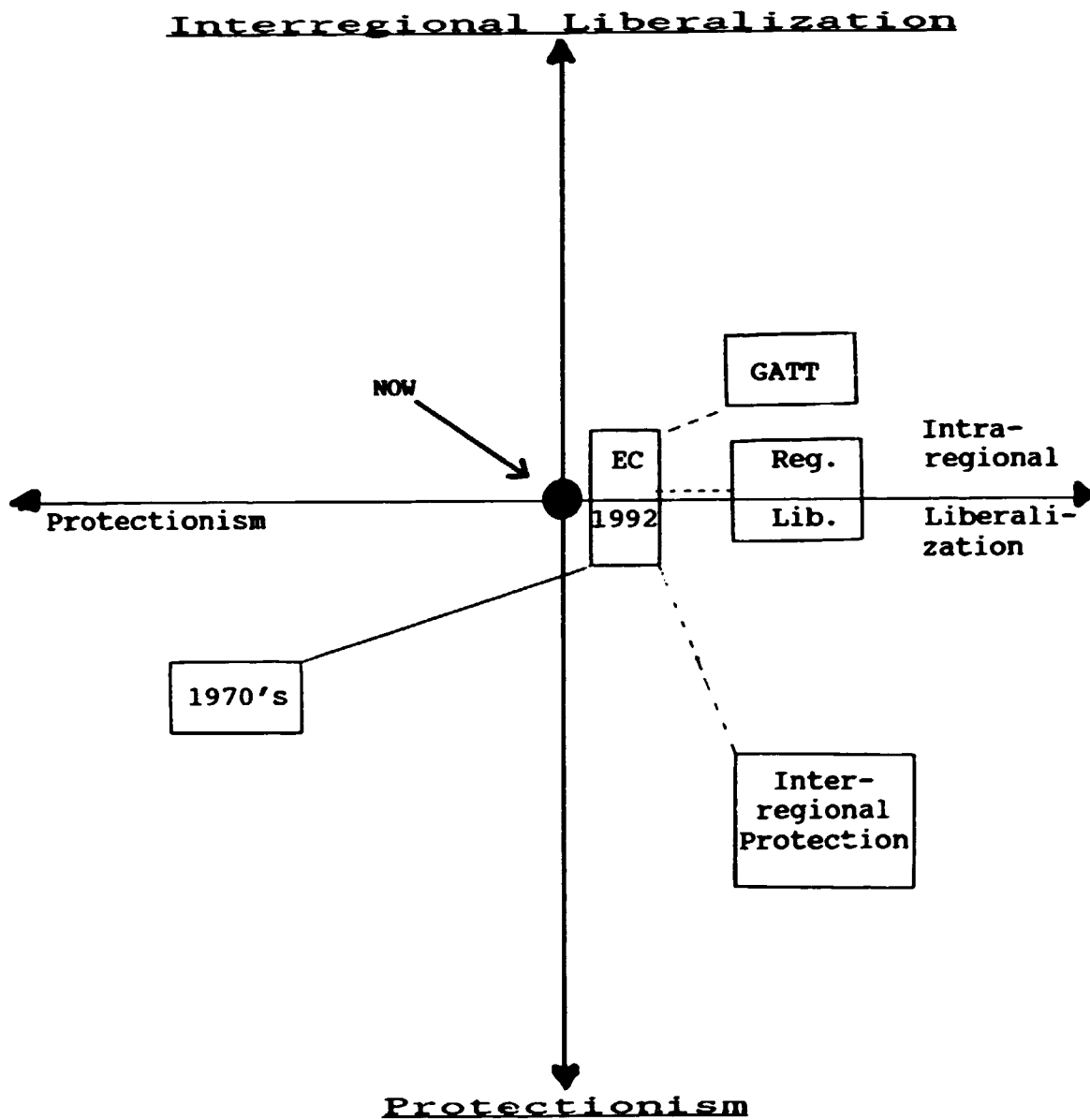
The issue of rural industries overlaps strongly with that of agro-industries, but a number of specific points were made. While the positive aspects of dispersed rural industries were accepted, with the shortcomings of transport infrastructure as a special argument (supplying centralized units

with agricultural raw materials over long distances, e.g., was difficult), the specific Vietnamese situation did not make it necessary to pursue an all-out dispersal strategy, which was possibly inefficient and may also lead to social problems in the countryside. There was no great congestion in urban areas yet and this partly undermined the argument in favour of rural industries. Although they could help to prevent future migration to the cities, the matter was not seen as urgent. Production which exploits the economies of scale of medium-sized units located in, e.g., market towns would often be more efficient, and the distances of these to the rural raw material sources would not pose a serious problem. The conclusion would be that there was no single answer to the question of dispersal versus concentration: a number of industries could operate very well in a dispersed way, while for others the smaller urban centres would be the proper location, depending on their specific characteristics. Small and larger industries could be tied into co-operating networks by exploring the opportunities for subcontracting more intensively. It was pointed out that, in addition to the suggestions made in this respect by UNIDO, "mother-son" arrangements between larger units and SSI already existed. It would be worthwhile studying these, and to use the experience gathered to further develop subcontracting arrangements.

With regard to the approaches suggested by UNIDO in the context of the strategy framework (see Part III, Chapter III), a variant integrating three basic approaches (labour/raw material/export intensive) was seen as the most attractive by some participants. However, Viet Nam should not rely too much on a cheap labour-based export-orientation (or a similar approach of "subcontracting for successful neighbours"). Instead, it should try to develop high-value exports (such as special ceramics, sea food and tropical fruit preserves) for specific market niches to strengthen its foothold in foreign markets. This would, a.o., also require greater attention to the quality of traditional handicraft, adaption of designs to overseas consumer preferences, etc.

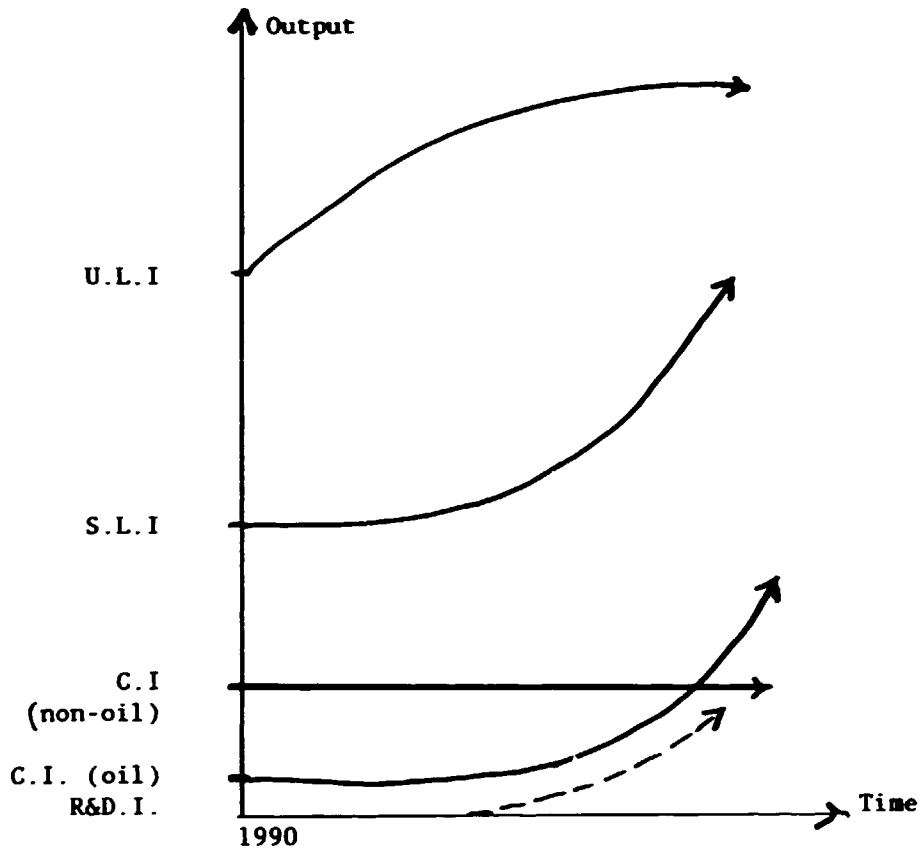
Finally, with regard to the technology and R&D issue, the idea of "technological villages" brought forward by UNIDO (see Part II, Chapter V) was considered rather premature. The problems surrounding the introduction of state-of-the-art technologies in a developing country like Viet Nam should be more closely studied before projects in this field were launched. It was, however, agreed that a coherent R&D policy was needed. There was a certain optimism with regard to Viet Nam being a "latecomer": this also meant that there was relatively little outdated capital stock, etc. - in a sense, a fresh start was possible. A condition, of course, was that international co-operation provided the country with the know-how and basic hardware for such a fresh start.

GRAPH 1



GRAPH 2

Possible future contributions of major branches (by key production factor) to manufacturing production.

**Key:**

- U.L.I.:** Unskilled labour intensive industries (textiles, clothing, food products).
- S.L.I.:** Skilled labour intensive industrial (engineering, electrical goods).
- C.I. (non-oil):** Chemicals, building materials.
- C.I. (oil):** Oil refining, petrochemicals.
- R&D.I.:** Research and development intensive (would initially probably include parts of S.L.I.).

PART II

VIET NAM'S MANUFACTURING SECTOR AND THE ENVIRONMENT FOR MANUFACTURING

Chapter I. THE INTERNATIONAL CONTEXT

1. The international restructuring process

The global pattern of manufacturing production and trade has become increasingly complex from the 1960s onwards. Substantial changes have occurred in the relative position of economies through rapid growth of manufacturing and trade in a number of developing countries. Growth of manufacturing in the developing countries surpassed growth in the developed areas after the middle of the 1960s, leading to an increase of their share in world manufacturing value added (MVA) from 9.8 per cent in 1970 to an estimated 14.1 per cent in 1989.

This relatively faster MVA growth of the developing countries as a whole was to a large extent a result of a successful penetration by a relatively small number of developing countries of the international markets for manufactured goods, initially mainly textiles, garments, processed food products and, somewhat later, electronics (integrated circuits). Over the years 1965-1986, manufactured exports of the developing countries as a whole increased twice as fast as manufactured exports of the industrial market economies, attaining 15.7 per cent of total manufactured exports trade.

There are obviously substantial differences in the development of the manufacturing sector among the developing countries. Within the low-income group, India and China are the dominant nations but they are not the fastest growers. Indonesia leads this group with a thirteen-fold increase in MVA during 1970-1987. But the major growth points are found among the middle-income countries (with a 1988 GDP of more than US\$ 500). The so-called newly industrializing countries (NICs), of which four are Asian economies, stand out. The Asian countries are the Republic of Korea, Taiwan Province of China, Hong Kong and Singapore. Their performance is depicted in Table 1.1. The source of rapid growth of the Asian NICs has to a large extent been their manufactured exports. It has been estimated that roughly 85 per cent of Taiwan Province's total exports and 82 per cent of the exports of the Republic of Korea is now in manufactured goods.

The NICs in general and the Asian NICs in particular have been strongly selective in their choice of manufactured export products or product lines. They show a successively declining role of the textiles and garments exports and a growing importance of the exports of metal products and machinery. The shifting relative shares of different manufacturing subsectors over time (Table 1.2) reflect advances in levels of industrial development. The growing relative importance of the machinery and equipment subsectors, for example, characterizes industrially advancing countries such as the Republic of Korea and Thailand.

Table 1.1. Manufacturing growth in Asian NICs

	<u>Share of world manufacturing output (per cent)</u>				<u>Average annual growth in manufacturing (per cent)</u>		
	1963	1970	1980	1986	1960-70	1970-80	1980-86
Hong Kong	0.08	0.15	0.22	0.29	...	10.1	7.1
Korea, Rep. of	0.11	0.22	0.49	0.92	17.6	15.6	12.5
Singapore	0.05	0.06	0.11	0.12	13.0	9.7	0.9
Taiwan Province of China	0.11	0.23	0.46a	...	15.5b	11.5c	...

a/ 1977; b/ 1961-1970; c/ 1971-1978.

Sources: Dicken, P., Global shift: Industrial change in a turbulent world. London, 1988; UNIDO data base.

Table 1.2. Structure of manufacturing in selected Asian developing countries, 1970 and 1987
(percentage)

	<u>Agricultural products processing</u>		<u>Textiles and clothing</u>		<u>Chemicals</u>		<u>Machinery and transport equipment</u>	
	1970	1987	1970	1987	1970	1987	1970	1987
Bangladesh	30	26	47	32	11	16	3	5
Korea, Rep. of	26	12	17	17	11	8	11	28
Philippines	39	43	8	8	13	10	8	8
Thailand	43	29	13	18	6	7	9	13

Source: World Bank, World Development Report, 1990.

2. Industrialization in the 1990s and related policy issues

While the industrialization of many developing countries has developed quite dramatically in the past decades, the global recession in the early 1980s has caused not only a prolonged halt to industrial growth for a large number of these countries, but also revealed the vulnerability of the established industrial production structures. The recent political changes in Eastern Europe and the coming Single European Market are also bound to make a strong impact on development trends. Long-term stability, in other words, is unusual in the international environment. The growth potential for many developing countries' industries is evidently great, but the issue of building-up a strong basis for long-term industrial growth in a world where constraints and uncertainties prevail is a complicated one.

The prolonged, accentuated internationalization wave is another major force. Internationally integrated industrial production is being pursued by large, global corporations. Some industrial subsectors are already dominated by a handful of very large corporations intent on remaining long-term market leaders. International mergers of giant firms are constantly occurring. The tendency towards creation of large regional common markets (EEC, USA/Canada) will probably further induce companies to merge into regional and supra-regional entities.

For the developing countries' continued industrialization these international developments are of crucial importance. National governments and companies need to assess their implications and to identify and utilize their development potential.

Many developing countries meanwhile are constrained by heavy indebtedness, low prices for their national commodities, unstable monetary and foreign exchange markets and fierce competition in partly protected markets for industrial and agricultural products. While hit by deficits in the public budget and balance of payments, they are confronted with a formidable structural adjustment pressure for reassuming sustained industrial growth.

This adjustment task consists, firstly, of the rationalization of production structures, with a view to increasing the dynamism of the sector and the linkages between the industrial and the primary sectors. Secondly, individual industrial plants need to be rehabilitated and modernized - or closed/merged - so as to ensure commercial viability and international competitiveness. Thirdly, general technological upgrading and new technological advances are needed to ensure that industry keeps pace with international developments. This in turn presupposes considerable efforts in creating the required research and development basis, human skills and organizational innovations.

As the required government resources are limited, the response of an increasing number of developing countries has been to induce the private industry sector to mobilize resources and build up its competitive strength. Deregulation and gradual trade liberalization reduce administrative constraints and expose industry to international competition. At the same time, the importance of an efficient institutional infrastructure to support industry is recognized. Efforts are made to revitalize support institutions, to promote private services and to strengthen the interaction between academic, industrial and government entities.

Industrial competitive strength of a company or a country is not just a matter of relatively low wages and cheap mass-produced consumer goods. Increasingly, competitiveness is becoming a matter of quality of products - including product design, packaging and fashion. Delivery time, batch production and various product-associated services are also of growing importance.

For a company, this requires high productivity of equipment and built-in flexibility of the product mix. Production technologies have made production in shorter series, using multi-purpose machinery, more feasible and economic. The precondition for this flexible specialization in industry is not only a better use of multi-purpose machinery and new ways of organizing the production units, but also a better skilled workforce. Through very active domestic and international market research and marketing and high

technological and organizational innovation skills, companies can identify and respond to new market niches rather than rely on an assumed stable market for mass-produced goods. Mergers and acquisitions often provide the required economies of scope.

Internationally seen, government policies seem to undergo, firstly, a liberalization wave, in which major obstacles for the functioning of product markets, labour markets and financial markets are removed. Secondly, a privatization wave is noticeable in a number of countries in which public enterprises are sold to private owners to increase efficiency and to reduce budget burdens. A third phenomenon is the decentralization wave. Large companies are tending towards decentralized decision-making and increased responsibility of specialized units, affiliates etc. so as to improve performance, initiatives, flexibility and accountability. Similarly, many countries, notably industrialized countries, seek to decentralize development administration and encourage local initiatives for economic expansion.

The above does not mean that developed country governments are leaving strategic decisions to "market forces" or doing away with state intervention now. Instead, many new forms of collaboration between government and industry are being developed. For the new changes at the level of industrial production and in the more diversified and changing markets for industrial goods also imply changes in the macro-economic policy setting. R&D policies, innovation policies, industrial policies, foreign trade policies, etc., all have to be revised according to the emerging industrial possibilities. There is a strong tendency to move the main emphasis in national economic policy-making towards technological change and industrial renewal.

An essential task for governments is to induce companies to acquire the resources needed and obtain crucial technological and market information. Particular attention and support is in most countries given to the small-scale industry sector. This sector can constitute a nucleus for innovative industrial activities and can play an important role in a dynamic industrial structure through specialized subcontracting and supporting production of parts and components for and provision of industrial services to the larger industrial enterprises. The government schemes and policies for the small-scale industry sector usually include "incubators" (to create new enterprises), marketing, training, technological information and infrastructure services.

3. Southeast and East Asia - the regional context

Viet Nam's industrial development can in the future be expected to be closely linked with the development of the other economies in the Pacific rim of East and Southeast Asia, which has emerged as the economically most dynamic region of the world.

Industrial restructuring in these countries is a response to developments such as rising wage levels (not offset by productivity increases) and increasing protection in export markets as well as growing competition from low-wage countries elsewhere in Asia. Consequently, strategies and policy measures in most of these countries now focus on internal generation and external attraction of relatively skill-intensive and technology-intensive industries. This also involves modification in certain institutional

arrangements as witnessed by the establishment of so-called "science and technology parks".

In these countries, there has also been a move towards the promotion of small- and medium-scale enterprises, which can make significant contributions to such important policy objectives as the generation of employment, mobilization of savings or linking agriculture and industry. The small-scale industries usually constitute the vast majority of industrial enterprises and provide most of the manufacturing employment. They contribute substantially to MVA and to exports of manufactures, and are receiving support in a number of countries.

The key issues confronting the policy-makers in Southeast and East Asia seem to be:

- The expansion of domestic demand, a.o. by a strategy of broader-based industrial growth, improving the living standards of the masses, e.g. through industries based on local materials and labour-intensive technologies;
- Increasing the international competitiveness of locally manufactured products, whether aimed at the external or the internal markets;
- The elimination of unnecessary bureaucratic procedures, and support to selected subsectors in the form of R&D, technology transfer arrangements, training, etc.;
- The development of the engineering industries, simultaneously strengthening the traditional labour-intensive units and supporting the development of technologically advanced and flexible enterprises producing goods of international standards;
- Supporting effective small-scale industry development with particular attention to:
 - new organizational forms of small industry co-operation and mechanisms for pooling resources;
 - linkages between the small and large industry sectors; and
 - enhancing the role of the small-scale industry in integrated development with other economic sectors, in particular with the agricultural sector;
- Increasing exports of manufactures through measures including the promotion of trading companies, market research, etc.;
- Assessing likely impacts of technological developments on traditional industries in terms of competitiveness, employment, etc.

If Viet Nam desires closer links with these economies, it should give particular attention to these issues to ensure that co-operation with countries in the region leads to optimal spin-offs.

Chapter II. THE VIETNAMESE POLICY ENVIRONMENT

1. The present policy framework

The Vietnamese economy is organized along socialist lines: large-scale means of production are collectively owned and many resources are allocated through central planning. The State Planning Committee (SPC), an advisory agency responsible to the Council of Ministers, formulates Five-Year State Plans which form the basis for the annual economic plans. The Five-Year Plans establish the major economic priorities and targets. The annual plans set specific targets for sectoral outputs and investments, mostly in physical terms, and specify the raw materials and other resources to be allocated to provinces, districts or productive units. Financial policies are oriented to accommodating the requirements of the physical plans.

On the basis of general indicators and guidelines provided by the SPC, each ministry, in consultation with state enterprises under its jurisdiction, draws up its annual plan targets and submits them to the SPC. The principle function of the SPC is then to balance the available resources through a complex process of consolidating the plans of all the ministries and the local governments. In early 1988 changes in the planning process were implemented for certain enterprises to the effect that plan targets are now formulated directly with the SPC rather than through the intermediary of the responsible ministry.

In the wake of liberalization measures in 1979-1980 the small-scale private sector came to account for a growing part of production and trade, in particular in the South where many firms with up to 50 employees operated; in the North, these enterprises are mainly found in crafts and repairs/services. A number of locally-run public enterprises were given more authority to set wages and bonuses and to do limited buying and selling in the free market. An agricultural contract system, providing farmers with essential inputs and consumer goods in exchange for the delivery of specified quantities of output (and permitting farmers to sell remaining output at negotiated prices to any buyer) had positive effects on exports.

In 1982-83, the pendulum swung back to a more centralized economy. Export performance suffered and in 1984 the monopoly of the foreign trade corporations was partly abolished. Local companies based in Ho Chi Minh City were allowed to enter in joint ventures with other provinces' trade companies.

During 1986, a reassessment of economic policies was made by the Sixth Congress of the Viet Nam Communist Party and a framework for economic reforms was approved. The main causes for unsatisfactory development in manufacturing were identified as follows in the assessment:

- Incoherent investment policies and inadequate adjustments in investment and production priorities to meet economic challenges;
- Insufficient attention to export-oriented production;
- Insufficient specialization and co-operation among producers;
- Weakly developed science and technology for industry;

- Heavy bureaucracy and centralization, discouraging initiatives of production units.

A new policy environment was created after the Congress which put Viet Nam on the track of a mixed economy system. A number of important laws, decrees and resolutions by the Party and the Government have followed which have helped to pave the way for market mechanisms. The more significant reform measures were the following:

- In the industrial sector, restrictions on wages have been abolished and enterprises became free to determine production and prices. Normal accounting procedures are being introduced and public sector enterprises are urged to raise their efficiency and make profits; profits are to be used for expansion or further improvements. This would enable the Government to drastically reduce subsidies. Enterprises are now liable for taxes on profits and turnover, and it would be a logical step to make them also responsible for identifying financial resources, finding markets and maintaining technological capabilities. Establishing linkages with other industries and with other sectors is encouraged.
- The Council of Ministers' Decree of December 1987 formalized the process of liberalization. The management of state enterprises was further decentralized; the Ministries of the Central Government and the Peoples' Committees of Provincial Governments are no longer directly involved in the management of any public production units. The Government agencies will concentrate activities more on macro-planning and overall co-ordination and guidance of the development process.
- In January 1988, the Law on Foreign Investment in Viet Nam was promulgated to induce foreign capital in priority areas. Foreign investment would be particularly needed:
 - (a) To implement large-scale economic programmes and export and import-substitution projects;
 - (b) To make full use of high technology and indigenous skilled labour and resources, and upgrade the capabilities of existing economic institutions and enterprises;
 - (c) To carry out infrastructural projects;
 - (d) To provide foreign-currency-earning services such as tourist facilities, ship repairs and airport, port and harbour services.

The Law was amended in 1990 to further facilitate the flow of foreign capital and know-how into Viet Nam. All Vietnamese private economic organizations are now allowed to have joint ventures and other forms of business co-operation with foreign organizations or individuals in the areas determined by the Council of Ministers. The Law also provides provisions assuring the foreign investors of fair and equitable treatment and guarantees the rights on their investment assets and profits. Equipment, spare parts and raw materials needed by firms with foreign investment can be imported free of tax. Profit tax is in the 21-25 per cent range, and lower for special and priority

projects as defined by the Government. The maximum tax on repatriated profits is 10 per cent. The State Committee for Co-operation and Investment, established in early 1989, is responsible for management and facilitation of foreign direct investment.

- The Resolution on New Regulations for the Non-State Economic Sector was announced in July 1988. The Resolution is intended to turn the non-public economic units into important components of the national economy. The heavy emphasis on collective production imposed from above on co-operatives, which has proved to be counter-productive, made way for an understanding that "...it is necessary to vigorously develop the family-based sector, joint state-private sector, and enterprises run by small entrepreneurs and individual capitalists in both the urban and rural areas." It enables these production units to operate outside the state planning process, without being discriminated against by Government monopoly organizations that supply raw materials and spare parts. It allows companies producing for export to use their foreign exchange earnings to import machinery and equipment, to choose their own sales outlets, and to negotiate their own foreign sales contracts.

During the transformation process conflicts are bound to arise, particularly as a consequence of the following phenomena: first, the policy shift toward a market-based economic system has introduced many decisions-makers for any given type of resource utilization in the economic system. Second, new reform measures often are not clearly defined and are likely to be read or interpreted in different ways. This will create confusion and unintended negative socio-economic results. Third, the sequence of new reform measures and the timing of their introduction in the economic system may not always be perfectly synchronized, and consequently unintended negative effects and distortions may ensue. Fourth, although decision-making has been decentralized to the enterprise level, the complete autonomy legally vested in the hands of enterprise management is not likely to be realized in the short run due to bureaucratic inertia. Lastly, but perhaps most importantly, all these potential problems are worsened by the fact that relevant information flows are seriously inadequate. In the past, the country has not encouraged the development of information systems necessary for the functioning of a market system. Such information as there is, is not freely available. As a consequence of all these factors, the number of private enterprises is not growing rapidly: in 1988-1989 an estimated 400 were established of which many appear to have closed down again within the two-year period.

A number of different measures could meet the challenges. Two types of measures are necessary. One is designed to rectify or control the destabilizing conditions created during the transformation process; the other is designed to promote and facilitate the objectives of the transformation. The focus should be on the latter. These measures can take the form of policy statements, plans, legislation, seminars, etc. They should be directed at the macroeconomic level as well as at the industry level.

At the macroeconomic level, the Government has introduced various measures to help stabilize the economy on its way to a market-based system. Efforts have been made to curb inflationary pressures through a reduction of government spending and a more restrictive monetary policy which included the introduction of more realistic interest rates. By mid-1989, inflation had

been brought under control. The government also committed itself to the introduction of more market-oriented prices and the dong was sharply devalued, bringing the official exchange rate more in line with the free market rate; the multiple exchange rate was abandoned, at least in relation to the convertible currency countries.

The potential benefits of these measures have been seriously eroded, however, by the changes that have taken place since late 1989 in Eastern Europe, on which Viet Nam has traditionally depended for economic assistance and subsidized trade. The effective breakdown of these trading relationships had resulted in a significant reduction of external capital and trade flows to Viet Nam. Agricultural and industrial production have been disrupted by reduced supplies and by reduced demand for Vietnamese products.

Faced with the threat of recession, the government has again started to resort to deficit financing. Subsidies to state enterprises have been resumed to tide them over their new problems. This again creates problems for private enterprises who do not benefit from such subsidies, and will delay the urgently needed rationalization of the public sector.

The rising cost of inputs and the contraction of exports is also having serious repercussions on the balance of payments, with preliminary indicators suggesting a significant widening of the current account deficit in 1990. The deterioration of the external balance is reinforced by the repatriation of large numbers of Vietnamese workers from Eastern Europe, which reduces inflows and adds to socio-economic strains in Viet Nam. The impending shift to the use of hard currency in trade relations with CMEA countries is likely to further exacerbate the situation.

In response, a number of measures have been taken to save foreign exchange and to boost exports. The establishment of an Export Processing Zone at Ho Chi Minh City has been approved. In late 1990, a further devaluation of the dong (by 27.5 per cent) was announced (which may not reflect the actual decrease in value of the dong), and an intensified campaign against smuggling was started.

The process of transformation and development will require further scrapping of old rules. New measures are also needed, such as fiscal policies focussing on expenditure rationalization and revenue mobilization, new trade policies, institutional reforms for private sector development and improvement of state enterprise performance, and reforms of the financial sector.

At the sectoral level, plans on the agro-industry development and science and technology development are under preparation. However, the task required at the sectoral level is vast and complicated, and requires co-ordination. These plans should particularly address the newly emerging class of decision-makers in the market-based economic system. Preparation of new policy measures at the macro and industry levels could benefit from assistance by international organizations such as UNDP, UNIDO and others.

2. The 1991-1995 Five-Year Plan and future policy issues

The policy guidelines in the new five-year plan (1991-1995) seem to suggest that the country pursues multiple objectives, with priorities in agriculture-related development. Even within the industrial sector, the

guidelines do not seem to have a clear focus: they emphasize agro-processing, consumer goods for the domestic market and for export, and some segments of heavy industries. While multiple socio-economic development objectives cannot be avoided, the efficacy of national economic development demands a simpler, more coherent central policy and a clear vision in respect of industrialization. Such a coherent central policy should be formulated on the basis of extensive studies and discussions with all relevant partners. In the process, questions such as the following should be raised and answered:

- Would it be strategically viable to serve both the domestic and export markets simultaneously (even in a limited segment of the industry such as consumer goods)?
- Would the export-oriented industrial development policy work as well in Viet Nam as in other countries such as, the Republic of Korea?
- Would the agro-based industrial development policy be enough to lead to a sufficiently high growth rate of the economy to absorb all new labour market entrants?
- Would the outward-looking agro-based industrial development policy earn sufficient foreign exchange to sustain a high investment rate as well as to service foreign debt?
- What will happen if the emphasis is put on the consumer goods industry development for domestic market rather than on export-oriented policy?
- Would a success of export orientation in industries related to labour-intensive and consumer-oriented products concurrently result in an industrial development satisfying domestic consumer needs?

Even with the national vision formulated, the Government would still need to provide further guidelines. Economic planners, policy implementers, and public and private entrepreneurs will face major questions such as:

- Of so many industry subsectors, which ones should receive higher priority in terms of resource allocation and administrative support?
- Would the "filière" approach for industrial development be a viable strategy in Viet Nam? If so, to what extent should the approach be applied and in what time frame?
- How would necessary technologies be acquired? In what sequence?
- Which segment of foreign markets should be pursued? In what sequence?
- How could domestic value added of production be increased?
- What would be the maximum labour absorption for a given industry without compromising productivity?
- What kinds of fiscal, financial, and administrative support would be required to foster infant industries?
- What kinds of institutional set-ups would be necessary to foster market-oriented industrial development?

- How can the public enterprises be made efficient enough to justify their existence under market-economy conditions?
- Which additional infrastructure would be required?
- Would the establishment of free trade zones and industrial states be necessary?
- To gain competitive advantage in the export market, what extra measures should be taken?
- What are the technical training requirements?
- What type of information network would be needed?
- Should imports of foreign competing goods be banned or controlled? If so, how long and which?

The discussion of these questions would provide basic ideas for an industrial development plan. This plan would serve the following functions: first, it would provide rather specific guidelines and signals to individual decision-makers; second, it would give confidence to investors as to the intentions of the Government; third, it would contain important signals for potential foreign investors. Each development plan for an industrial subsector (or subsectoral development strategy) would also need to contain references to "support policy" issues common to all other industries, such as investment incentives, preferential loans, technology development plans, human resource training, infrastructure, etc.

The above suggests four potential programme areas in which UNDP/UNIDO can be of assistance to the Government of Viet Nam:

1. Assisting in identifying a simple, coherent central development policy for industrial development;
2. Assisting in formulating subsectoral development strategies;
3. Assisting in analyzing and formulating industrial support policies;
4. Assisting in studying and formulating a system which would enhance the efficiency and competitiveness of state enterprises.

Chapter III. ANALYSIS OF THE MANUFACTURING SECTOR

1. Economic structure

Viet Nam has a population of 64 million. Population growth is high: it is expected that the country will have over 80 million inhabitants by 2005. Economic policy thus faces the challenge of improving standards of living of and providing employment for a rapidly increasing population. Currently, the labour force is some 29 million strong, and one million young people enter the labour force every year.

The structure of the Vietnamese economy reflects the predominance of the agricultural sector, essentially based on rice cultivation (see Table 3.1). The share of agriculture is declining slowly, but the sector still accounted for almost half of GDP in 1989. The sector accounts for over 70 per cent of the labour force and some 30 per cent of export earnings. Agricultural statistics suggest uneven performance during the late 1980s, with strong yearly fluctuations, and stagnating production figures for some crops. The recent reforms have, however, had a positive impact on rice production, and by 1989, Viet Nam was exporting some 1.4 million tonnes of rice. Shortages of basic food products now seem virtually eliminated, but long-term growth of the food supply is not guaranteed yet. The provision of domestically produced inputs (fertilizer, pesticides) and equipment is quite limited, many of these goods being provided by the now insecure sources in Eastern Europe. More details on the agricultural sector will be found in Section 3. in the paragraphs dealing with agro-related industries.

Table 3.1. Viet Nam - GDP. Selected years
(million 1982 dong)

	1980	1986	1987	1988	1989
Total	120,130	169,560	173,879	183,878	188,273
Industry	31,270	48,420	53,947	56,033	54,029
Construction	4,430	5,010	5,289	5,104	4,933
Agriculture	61,330	84,580	81,657	84,511	91,331
Forestry	200	1,400	1,486	3,042	3,150
Transport and communications	2,190	3,130	3,456	3,481	3,411
Trade, material supply	18,400	23,400	24,318	25,802	27,220
Others	2,340	3,620	3,726	3,905	4,199

Source: Statistical data of the Socialist Republic of Viet Nam.

The industrial sector, including mining, accounted for some 28 per cent of national income in 1989. Employment is comparatively limited: only 11 per cent of the labour force was involved in industrial production in 1988, a figure that has barely increased since 1980. The sector was the most rapidly growing one in the economy in recent years, and has been a major recipient of state investment throughout the 1980s. The investment trend has been upwards, the sector accounting for 53 per cent of total investment of 13,900 billion

dongs (1982 prices) in 1989. The energy industries received more than half of the total industrial investment. Most of the investment is centrally allocated, and intended for physical infrastructure for industry.

2. Growth and structural change in manufacturing

Between 1980 and 1988, gross industrial output (in 1982 prices) rose by more than 100 per cent, from 66,925 dong to 137,828 million dong (see Table 3.2), including a small amount for the energy industries. This gives a good impression of the rapid production growth that was achieved in manufacturing. The share of MVA in gross output decreased, however, from 47 per cent in 1980 to 41 per cent in 1988. An absolute decrease of MVA was recorded in 1989 (cf. Table 3.1). In other words, the net contribution of the manufacturing sector to the economy grew slower than manufacturing output, and it actually decreased in 1989.

The greatest increase in production was recorded in the co-operative and private sector, during the first half of the decade. This sector improved its share in total output from 40 per cent to 45 per cent during 1986-1988. In public industries¹, the production share of those under local management rose from 64 per cent in 1980 to 67 per cent in 1987. Large industries usually belong to the public sector, the average gross output per public unit being some 14 times higher than that of co-operative or private units.

Structural change has been quite limited during the 1980s. The most conspicuous shifts were (see Table 3.2):

- In the public sector, an increased share in gross output for the food products branch;
- In both public and private sectors, an increased share for engineering;
- In both sectors, a decreasing share for the building materials and wood products industries;
- Among the smaller branches in the public sector: a more than 100 per cent growth in the electrical goods and leather industries.

During the 1980s, there has also been a rather clear shift from heavy to light industry: the latter accounted for 62 per cent of gross output in 1980 (1982 prices) and for 71 per cent in 1989. Among the light industries, the food industries are the most important, followed by textile and garments.

The industrial labour force totalled 2.8 million in 1988, of which one-fourth worked in public sector enterprises. The employment growth rate in public and private enterprises has been nearly equal, which - given the increasing production share of the private sector - implies that output per worker has risen faster in private enterprises than in public enterprises. In the public sector, productivity per worker grew faster in the light

¹ Includes a number of joint ventures between the government and domestic entrepreneurs, with the latter usually providing the management.

Table 3.2. Structure of gross production in industry, selected years
(Per cent)

	Public enterprises and domestic joint ventures				Co-operative and private enterprises			
	1980	1986	1987	1988	1980	1986	1987	1988
Electricity	7.3	8.3	8.4	7.5	0.0	0.0	0.0	0.0
Fuel industry	-	-	2.2	2.0	0.2	0.1	0.1	0.1
Metallurgy	3.2	2.0	2.0	2.3	0.7	0.7	0.6	0.5
Production of equipment and machines	8.3	8.6	9.0	10.2	8.0	7.6	8.0	9.3
Electric and electronic technology	1.3	2.1	2.3	3.0	1.2	1.2	1.4	1.6
Manufacture of other metallic products	1.5	2.0	2.2	2.5	8.2	8.2	8.0	8.6
Chemical, mineral fertilizers and rubber	11.9	11.3	11.6	11.5	5.8	7.6	7.6	6.7
Building materials	7.2	7.0	7.2	6.9	8.7	6.4	6.6	5.8
Exploitation and processing of wood and forestry products	9.7	6.6	6.1	3.5	13.0	10.7	10.8	10.6
Cellulose and paper	4.2	4.7	4.2	4.0	1.2	2.2	2.2	2.3
Glass, earthenware and porcelain	2.1	1.1	1.2	1.0	1.8	2.4	2.1	2.1
Food, food stuffs	21.5	23.3	23.4	24.5	29.9	30.9	30.5	29.8
Textiles	13.1	14.6	14.2	13.7	10.9	12.1	11.6	10.9
Clothing	1.9	1.7	1.9	2.7	3.8	2.9	2.8	3.3
Tanning and manufactures of leather products	0.7	0.5	1.0	1.6	1.5	1.9	1.8	1.5
Printing	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.6
Other	2.7	2.8	2.7	2.6	4.7	4.7	5.5	6.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (in million 1982 dong)	40,288.9	63,247.5	68,695.4	77,865.3	26,636.2	48,503.2	53,683.9	59,962.8

industries than in the heavy industries, and faster in industries under local management than in those under central management.

Although the data base is incomplete, the figures suggest that relatively small, labour intensive enterprises under decentralized (private or local public) management are the most productive. These may also be less dependent on imported inputs, spare parts, etc. Given the problems that are arising with regard to imports of these from the major source area, Eastern Europe, the decreases in capacity utilization that have probably taken place¹ may not have affected these enterprises as much as the large, capital-intensive ones.

3. Major subsectors and branches

3.1 Metals and engineering

Viet Nam has large iron ore resources (600 million tonnes), and two iron and steel complexes. Together, these have produced some 65,000 - 75,000 t/y of steel in recent years, although the one of the mills by itself has a capacity of 130,000 t/y. It has suffered war damage, and both mills suffer from a shortage of coking coal.

Viet Nam only has limited reserves of coking coal. Although attempts are being made to use the abundantly available anthracite reserves as a substitute, it seems likely that a major boost in iron and steel production will depend on the adoption of new technologies. The planned output of 150,000 tonnes for 1995 is too optimistic under the present circumstances. With regard to the energy issue, the large hydropower projects in the North could be part of the solution.

The most important secondary industry is the foundry industry, which provides basic products for the engineering branch. Its production has been more or less stagnant for a number of years, and the quality of the products is variable. An in-depth review of the foundry industry would be needed to identify the problems and to formulate remedies.

Viet Nam has large reserves of non-ferrous metals such as tin and bauxite. The tin deposits are widely spread, and have poor beneficiation characteristics; the bauxite deposits are large, but have only recently been discovered in their full extent. Processing is therefore hardly developed yet. UNDP/UNIDO assistance is being provided for research and the testing of processing technologies. With a major expansion of hydropower, the exploration of these ore reserves could be accelerated. Viet Nam also produces chromium, but output has decreased throughout the 1980s, from 9,100 tonnes in 1980 to 4,600 tonnes in 1988.

The engineering/metalworking industry consists essentially of small and medium sized enterprises. Of some 600 enterprises now active in the sector only 180 have fixed assets of over 200,000 rubles/dollars. Of these, 107 are engaged in manufacturing and 73 in repairing. Most of the enterprises are located in major cities. Some are under central management, others are under provincial management. In addition there are about 750 co-operatives, 3,800

¹ In 1986-1987, the average capacity utilization rate for the whole manufacturing sector was in the 60-70 per cent range.

other collective groupings and a number of individual families engaged in engineering all over the country. State enterprises account for approximately 70 per cent of total output. The products of the sector range from diesel and electric motors to small tractors, water pumps, machine tools and small ships.

Most of the machine tools are small and designed for conventional multipurpose utilization. Precision is low and machines are usually over 20 years old. Heating equipment, testing and measuring devices are in short supply. About 300,000 persons are employed in the engineering/metalworking industry sector. Of these some 10 per cent are skilled workers.

The main problems of the sector are

- (a) The technology used is frequently simple or outdated, affecting product quality;
- (b) Because of the age of the machinery and the dearth of good quality and sufficient spare parts, breakdowns are common.
- (c) Most products are of outdated design, including consumer goods, as well as industrial and agricultural equipment;
- (d) Many of the production units are badly organized;
- (e) Electronic parts and components and instruments for process and quality control and testing are hardly used or produced;
- (f) While qualified personnel is available for mechanical operations, there are serious weaknesses in the areas of material engineering and material sciences.

Specific areas needing attention would include the improvement of agricultural machinery and processing equipment, the manufacture of good quality sawmill machinery, spare parts for sugar mills and improvements in the design and quality of the most important means of transport, the bicycle.

3.2 Agro-, forest- and fisheries-based industries

(a) Agriculture - present situation and development plans

Agriculture is the mainstay of the economy of Viet Nam. It provides food for the population, raw materials for agro-based industries - and it is a source of income for the majority of the Vietnamese people. Present agricultural policy can be summed up as follows:

- Attaining self-sufficiency in food (i.e. 350-400 kg paddy equivalent per capita/year);
- Increasing tropical crops to ensure sufficient raw materials for export-oriented food industries;
- Subsectoral increases in R&D for agriculture and agro-industry;
- More agricultural employment and improved standards of living in rural areas, including provision of services.

Substantially increasing food production, in addition to increasing production of industrial crops for processing, is a tremendous task. It will require better extension services, credit facilities, improved crop varieties and animal stock, and modified agricultural technology adapted to the particular conditions in Viet Nam.

The cultivated area has increased from 8.25 million hectares in 1980 to 8.94 million hectares in 1989. In 1995 and 2005 the total arable land will be 10.8 million and 12.6 million hectares, respectively, according to the current development plan, but these figures seem too optimistic.

Table 3.3 shows production of food crops (paddy and paddy equivalents). The table also shows average production per capita, which has slowly increased between 1980 and 1988. The longer-term projections seem somewhat optimistic. In general, the production targets for most of the industrial crops are also rather optimistic, even considering the recent improvements in agricultural output. The shortage of inputs such as fertilizers, pesticides, fuel etc., the prevailing system of trade in agriculture (state trading organizations still dominate), and lack of easily available credit for co-operatives, collectives and households are serious obstacles to rapid output growth. This means that the planned increases in output of the food processing industries may not be attained either.

Table 3.3. Total production of food
('000 tons)

	Actual production			Projection		
	1980	1985	1989	1990	1995	2005
Total food production (paddy equivalent)	14,406	18,200	21,440	22,000	25,000	32,000
Paddy	11,657	15,875	18,927	19,000	21,000	26,000
Subsidiary crop	2,749	2,325	2,513	3,000	4,000	6,000
Average kg food products per capita	268	304	307 ^{2/}	330	342	376

^{2/} 1988.

Source : Ministry of Agriculture and Food Industry

The price of rice, the major commodity, is increased in steps by the Price Commission according to the inflation rate. Rice is therefore comparatively safe to use as a barter commodity. Whether or not the price for the producer is reasonable cannot be assessed easily. The barter system has penetrated down to the farm level. Paddy is delivered in exchange for inputs which have been supplied during the cropping season. Fertilizer and

pesticides are the major items but the actual value is difficult to determine. The mismatch of input and product prices contributes to the low output of many agricultural products.

The present barter system is not conducive to better performance of agriculture. The system also tends to encourage many trading enterprises to enter the fertilizer trade. These enterprises could devote their resources more effectively to product development, manufacturing/processing and marketing of their products.

Agricultural machinery, equipment and tools are manufactured by state enterprises at central level, under the Ministry of Engineering and Metallurgy or Ministry of Agriculture, and at provincial levels under the provincial governments. Co-operatives and other enterprises under the Central Council of Co-operatives and Non-Governmental Organizations also play an important role.

Appropriate equipment would reduce drudgery and shorten the time to complete different tasks. Timely soil preparation and subsequent planting gives better yields. If the harvesting procedure can be speeded up, losses due to weather conditions could be reduced. The appropriate cleaning and drying facilities could further minimize post-harvest losses. The returns from efforts to reduce the post-harvest losses would be substantial. Experiences from other Southeast Asian countries could be exploited for development of systems suitable to Viet Nam. Initially, comprehensive literature studies could help to identify possible alternatives.

Actual demand for fertilizer in 1988 was projected at 1.5 million tonnes of urea and 1 million tonnes of phosphate fertilizer. There was also a demand for 100,000 tonnes of compound fertilizer. The difference between demand and actual local production was presumably met by imported fertilizers.

Total production (design) capacity for chemical fertilizers is 810,000 tonnes (including 100,000 tonnes of compound fertilizer), but in 1988 and 1989, only 502,800 tonnes and 373,000 tonnes, respectively, were produced. Low capacity utilization is caused by lack of coal and spare parts. The natural phosphate plant of 90,000 tonnes capacity is operating at full capacity.

To reduce import dependency domestic production needs to be increased. Viet Nam has a large reserve of phosphate rocks, estimated at more than 2 billion tonnes, with an industrial reserve of 400 million tonnes. While attempts will be made to fully exploit existing capacity, it is also planned to increase production of phosphate. By 1995, 700,000 tonnes of additional production capacity is to be installed.

For nitrogenous fertilizer, the increased offshore exploration in the south, with scope of producing 1 billion cubic meters of associated gas by 1990, have made the Government explore the possibility of investing in a plant with a capacity of 600 tonnes of ammonia per day. This gives the option of producing either 600,000 tonnes of ammonium sulphate per year or 270,000 tonnes of urea per year.

Crop losses due to insects, weeds and plant fungi are estimated by the Ministry of Agriculture at about 20 to 25 per cent, but in recent years may have been higher, pests destroying the total crop in many regions. Viet Nam

relies on imports of formulated products and of the active ingredients for pesticides for its mixing plants with a total capacity of 40,000 tonnes per year. In 1988 the estimated production of formulated products will only reach 25 per cent of the total capacity due to problems with spare parts and hard currency for import of raw material. One of the general problems of the pesticide industry is the simple technology and equipment used for production: quality control is far from satisfactory and there seem to be no regulations for the safety of the workers and the handling and disposal of the waste.

There is a research centre engaged in research on using local raw material for the production of pesticide active ingredients. The equipment is outdated and the centre receives no technical information, research documents or scientific information from elsewhere. At the moment the center is producing small quantities of a dual purpose agent for treatment of paddy seeds. The aim is a production of 500 tonnes per year.

Viet Nam has plant varieties which could be used to extract active substances for the production of pesticides. Research and experiment are being undertaken but full-scale production is not yet possible. Regulations for the proper handling of pesticides are also needed to halt the numerous disasters caused in the past by accidents or human errors.

On the basis of the above observations it is recommended that measures be taken to:

- Strengthen the extension capacity with a view to disseminate improved agricultural practices.
- Increase, and extend, the manufacturing capacity of agricultural equipment and tools.
- Strengthen the resources, within the framework of international co-operation, for development of suitable equipment for paddy harvesting/drying (follow-up of Cuu Long Post Harvest Pilot Project VIE/85/012/A/01/12).
- Set up the appropriate credit facilities for farming enterprises.
- Review and modify the pricing policies and the system of payment to comply with the requirements for flexibility and to provide incentives for increased production of quality commodities.

(b) Agro-based processing industries

Although there are only 128 food processing firms registered with the Ministry of Agriculture and Food Industry, it is known that many smaller and medium-size firms exist, owned by local governments, co-operatives and private entrepreneurs. Most of these firms are located in the larger urban centres. Rice milling operations are by far the most common.

The present rice milling capacity in central and provincial state enterprises is 2.4 million tonnes, which is basically used to supply the urban areas. An estimated 70-80 per cent of the paddy is processed in small mills on a co-operative or village level. Rice milling capacity is gradually increasing. The larger and medium-sized rice mills, however, are getting old.

the mechanical installations are worn out and are kept running with minimum maintenance. Spare parts are sometimes short in supply but local workshops appear to make the most essential parts. In view of the average poor state of repair of the plants, it is safe to assume that capacity utilization may be 70-80 per cent.

To cope with the planned future increase in paddy quantities, about 200 rural rice mills with an average output of 10 t/shift will have to be installed between 1990 and 2005. Moreover, some old large mills will eventually have to be closed down. Therefore, up to 2005, 45 new rice mills with a capacity of 180,000 t/y will be needed.

The rehabilitation of the existing rice mills should a.o. focus on the quality of output, i.e. the reduction of the percentage of broken rice. For the country as a whole about 2 million tonnes of rice per year could thus be salvaged for human consumption. Storage facilities for paddy are reportedly sufficient but it is thought that the standard leaves much to be desired. However, post-harvest issues including grading and quality control, and pricing levels are now the subject of a large UNDP/FAO project. This is of tremendous importance for more efficient rice handling.

Different avenues for improving rice milling may be considered such as licence agreements including technical assistance, and joint ventures where the foreign partner supplies components according to predetermined principles for costing and subsequent pricing of the final equipment.

Presently, the maximum practical capacity for animal feed processing is considered to be 420,000 tonnes per year. The larger processing plants belong to the Ministry of Agriculture and Food Industry and provincial authorities. Districts usually have small grinders for animal feed.

The feed industry suffers from inadequate equipment; in general the feed processing plants or units are unable to produce animal formula feeds of acceptable quality and uniformity. A large number can no longer be rehabilitated. The industry as a whole operates at below 60 per cent of its maximum practical capacity. Raw material supply is invariably inadequate from a quantitative and qualitative point of view. Laboratory facilities are non-existent, and samples, wherever they are taken, have to be transported to a central laboratory.

The Government wants to expand consumption and exports of pork and pork products. This is not a realistic proposition if the pigs cannot be reared efficiently. The feed processing industry is vital in this respect. It could become an efficient instrument for introduction of better feeding practices and thus for improving the nutritional standards of the animals. At present most livestock is fed with whatever feed is available on the farm. Total demand for pig and poultry feed in 1995 is estimated at 5.2 million tonnes and 3.4 million tonnes, respectively.

To improve the performance of the feed industry it is suggested that:

- Efforts be made to drastically improve the quality of inputs;
- The pricing system be linked to the quality of the commodity and minimum requirements of all ingredients established;

- Future development of the industry be based on a main, central feed processing plant where pre-mixes, concentrate mixes and complete formula feeds are processed. These are supplied to smaller, simpler feed mixing plants which require less investment per tonne of processed feed. The staff of the central feed plant should also provide expertise to the mixing plants. One advantage of a system like this is flexibility where future expansion of activities is built into each scheme serving one or several provinces.

At present the vegetable oil processing industry is to a large extent geared towards extracting oil for export, in particular from coconuts, ground-nuts, soybeans and cashew nuts. There is a constant deficiency of oil-bearing seeds. The situation may improve as instructions have been given to the state farms in the south to expand the cultivation of coconut in particular.

Downstream production is often unhygienic and technically backward - it is estimated that 6,000-7,000 t/y of crude oil are lost because the solvent extraction plants cannot be operated. These are to be rehabilitated. The overall capacity for mechanical extraction is quoted at 55,000 tonnes of crude oil on an annual basis. The oil processing industry is operating at about 50 per cent of its designed capacity and 60 per cent of its maximum practical capacity; refinery capacity is 35,000 t/y, but capacity utilization is less than 50 per cent. This is partly a consequence of exporting crude rather than refined oil.

The future plans for the vegetable oil processing industry are unclear. Whether or not the refinery capacity is going to be increased depends on the future market situation. Soybeans, a major source of edible oil, are produced at very competitive costs in North and South America, and Malaysia is a large producer of palm oil which is exported at competitive prices. The comparative advantages of processing in Viet Nam will therefore have to be identified to justify expansion of the industry.

The close linkage to the feed processing industry is a positive factor, but much of the mills' oil cake is unsuitable for animal feed without further processing. This issue would have to be addressed as well. The Animal Husbandry Research Institute which conducts development studies on beef production in Viet Nam should be consulted in this context.

Increasing production of oil-bearing seeds and the recovery of oil from rice bran would be another element in the future strategy for the vegetable oil processing industry. The anticipated production volumes are 1.3 and 1.6 million tonnes in 1995 and 2005, respectively. The projections seem unrealistic, not only because the required production of raw materials is unlikely to be attained, but also because the plants, if fully rehabilitated, could only process a fraction of the bran.

On the basis of the available information the following guidelines for a future strategy for development of the vegetable oil processing industry are suggested:

Phase 1

- (i) Rehabilitation of existing central processing industries including mechanical extraction plants, solvent extraction plants and refineries.
- (ii) Rehabilitation of the processing department for shortening and margarine at the Tan Binh factory.
- (iii) Detailed investigation of the comparative advantages from a marketing point of view focused on the actual production costs and quality of products.

Phase 2

- (i) Rehabilitation of existing oil crushing units on provincial and district levels, aiming at improving the crushing performance resulting in a lower residue fat content in the oilcake.
- (ii) Formulation of a project for investment in new installations on the basis of a review of the current oil-seed production; establishing a number of complete vegetable oil processing factories where part of the refinery capacity, defined as a result of phase 1(iii), is utilized to process crude oil supplied from province and district crushing units. The oilcakes should be retained locally and used in province or district satellite feed mixing plants; a high degree of co-ordination is essential to create solid linkages.

Phase 3

- (i) Establishment of vegetable oil processing factories according to the plan derived from phase 2(ii) above.
- (ii) Establishment of oil crushing units in areas of soybean and ground-nut production, in particular.

With regard to refineries, investment should depend on the market outlook and subsequent economic analysis. Care should be exercised to avoid over-investment in this branch.

The sugar industry has presently six central state factories and four on a provincial level, with a total installed capacity of 11,000 tonnes of sugar-cane per 24 hours. Due to various deficiencies the maximum practical capacity is considered to be 8,600 tonnes.

The installations for extraction of the juice are of simple design, ruggedly built and appear to work without major disturbances but with low efficiency. The evaporation and crystallization departments and the filtration section are very old and in a bad state of repair, wasting a considerable amount of energy. Future rehabilitation efforts should therefore also concentrate on suitable measures for heat recovery.

The sugar produced by the sugar factories accounts for 25 per cent of the domestic demand. The small-scale sugar crushing plants and household extraction units are of greater importance for the domestic supply of sugar. But these are even less efficient.

The industry also suffers from a shortage of raw materials; the production of cane in 1990, for example, was probably less than 60 per cent of the projected 10.2 million tonnes. A major reason appears to be the low price of the sugar-cane for the producer. Cultivation is very dispersed and the transport distances are far too long for a bulky material like sugar cane which, in addition, has a fairly low sugar content.

The Ministry of Agriculture and Food Industry has based its plans for the industry on expanding domestic and export markets. The quality of refined sugar is to be improved to make the product more competitive. The total planned quantity of industrially processed sugar and molasses is quoted at 900,000 tonnes in 1995 and 1.5 million tonnes in 2005. These figures seem too optimistic: actual sugar production was 377,000 tonnes in 1989, and cane production has remained far below projections. The investment programme, however, is based on the optimistic projections. It has three phases:

- Investments in existing factories to permit continued operations until 2005 and later - total capacity 11,000 kg of sugar-cane/day.
- Establishment of 10 new factories by 1995 - total capacity 15,000 tonnes of sugar-cane/day.
- Establishment of further 36 plants up to 2005, bringing the total national capacity to 35,000 tonnes of sugar-cane/day.

To achieve the plan targets, modifications of the pricing policy and the system of payment to the producers are essential to improve the supply of cane. Research and improved extension services will also be needed to improve cane quality. Action should also be taken to increase the recovery rate of sugar in non-industrial processing units.

Presently Viet Nam grows a wide range of tropical fruits, part of which is processed in 13 fruit and vegetable processing plants. They have a total capacity of 45,000 tonnes per year, mainly canned and frozen products. The industry is extremely labour intensive. The hygienic conditions and the working environment are invariably of low standard, packaging is often simple and sometimes inadequate for preservation, and quality is not uniform.

The processing of fruits and vegetables is to a large and increasing extent oriented towards export. Export hitherto has been within the framework of co-operation and trade agreements with socialist countries where the quality requirements are less pronounced. It is likely that this also reflects on the price, but the processing enterprises rarely know exactly what they get. A common constraint is deficient supply and low quality of raw materials. The reasons for this differ but the pricing policy and system of payment provides very few incentives to producers.

Most factories belong to the state corporation Vegetable and Fruit Export Import Corporation (VEGETEXCO). Each of the factories has its own can-making workshop equipped with simple machine. Almost all use handtools to spray varnish on cans. The use of uncoated tin, the deficient hand-spray coating

practice, and/or the use of improper varnish solutions for packaging of acidic foods result in substandard and non-exportable products. The Food Canning Research Institute (FCRI) in Hanoi (with branch in Ho Chi Minh City) is mandated to look into the matter.

The future development of the Vietnamese fruit and vegetable processing industry depends on its capability to upgrade the processing facilities and introduce modern technology. This will ultimately reduce the labour intensity which is the price that will have to be paid to improve product quality and overall hygiene.

It would be wrong to try to replace current export markets with other markets. The long-term strategy should rather be to maintain existing business contacts and to produce products which are attractive world wide. This would enable the fruit processing industry to exploit new market opportunities and to fetch better prices for its products. Top quality products, competitive prices and delivery on time are essential for success. Assessments of market trends must be obtained through extensive market research.

The Ministry of Agriculture and Food Industry has envisaged an expansion of the fruit and vegetable processing industry to a total output of 100,000 tonnes per annum by 2005. The ultimate processing capacity, product range etc. will have to be based on internal investigations to identify areas of production, type of raw materials and cost of production.

Choice quality products can only be produced from fresh, high grade fruits and vegetables. The processing industry should therefore take an early initiative to promote the supply of first class raw material. Selection of varieties, improved cultivation practices and an appropriate pricing system with premiums for high quality are important.

The slaughtering and meat processing industry incorporates at present only slaughtering, butchering and freezing, partly for export and partly to maintain a minimum revolving reserve of meat in large urban areas. There are 10 slaughterhouses with freezing facilities. Total designed slaughtering capacity is 50,000 t/year and maximum practical capacity is some 40,000 t/year. Pigs account for 90 per cent of the total. Most of the slaughtering facilities are reportedly below standard technically and hygienically, and they process only a small part of the total meat supply. The domestic consumption of meat and meat products was 8.7 kg/capita in 1985. This is to increase to 20.9 kg in 2010.

The current volume of exports is not known but is probably of the order of a few thousand tonnes, mostly pork to the Soviet Union, Singapore and Hong Kong. The meat for export is merely packed in plastic bags without separating cuts of different qualities, which implies a loss of earnings on good-quality meat.

For future development the following issues are to be considered. Export of meat, and pork in particular, is seen as a future source of higher foreign exchange earning. By 1995, 100,000 tonnes are expected to be exported. This, however, is not possible if domestic consumption per capita is to be raised as well. While efforts must be made to increase meat production, policies will have to strike a balance between improved standards of living and increased foreign exchange earnings.

Future investment in slaughterhouses must take account of market developments, modern hygiene and technical requirements and livestock production trends. In addition, the future prospects and options for export must be reviewed in detail, considering markets and market demand and the present and likely future competition. Major export markets would be the socialist countries presently importing meat from Viet Nam and big population centres like Hong Kong and Singapore. Western European countries and the Americas are not believed to be future markets. Japan, on the other hand, may be interested, if products of high quality can be offered. Slaughterhouse design should allow for future improvements as market prospects or requirements are likely to change in the medium-term.

Introduction of further processing of various products is essential to add value to the exports and to create jobs. Domestic demand for such products is believed to be limited for quite some time. The initial product range should be identified by market research at an early stage to form a basis for planning facilities.

The leather industry should be mentioned as a further downstream industry. The tanning and leather products industry is based primarily on cattle and buffalo hides. Given the slaughter ratios, some 600,000 hides should be available annually. At present, the quality of hides and of tanned leather is rather low. The formal sector leather products factories produce some 30 million pair of footwear annually. While export potential is probably not very large, future development of the industry would benefit from improving the quality of raw materials and of output. This would also increase its competitiveness vis-à-vis imported footwear.

(c) Fisheries-based processing industries

Viet Nam's potential for coastal fisheries is estimated at 1.3-1.4 million tonnes/year, that of deep-water fisheries at more than 1 million tonnes. Deep-water resources are now exclusively being exploited by foreign vessels. The production system is based on individual fishermen serviced by state enterprises which also collect, process and market the fish. In 1987, catches amounted to 870,000 tonnes and were expected to reach the target of 1 million tonnes in 1990. The fresh water catch target is set at 500,000 tonnes. The importance of cultivated fish and sea food is expected to increase in the future. 300,000 hectare of salty and/or brackish waters are used for cultivation of sea food at present.

Efforts will be made to interest foreign partners in participating in the expansion of cultivation of fish and other sea foods, especially shrimp, on an industrial scale. Joint ventures (such as have been concluded with Soviet and Australian firms) are evidently seen as an essential element in obtaining foreign funds for future investments; these should be associated with transfer of technology to improve the quality of products as well as to widen the range of products for export, and to initiate an orientation towards techniques using refrigerated vessels, especially in more distant waters.

The necessity to consider the conservation of the environment is fully realized. It is a major policy issue to coordinate development efforts in all sectors, agriculture, forestry, fishery and industry, to ensure that negative ecological effects are not created by one sector which are detrimental to the development of another.

The national fishing fleet has a total of about 60,000 boats (usually rather small and obsolete). The total work force engaged in fishing amounts to 214,000 but due to deficient equipment 12-15 per cent have to stay ashore. There is no information available regarding the number of state enterprises engaged in fishing, but they are reportedly not very successful.

Regulations exist with regard to fishing methods and mesh size of equipment to reduce the catches of juvenile fish, but these do not seem effective. The quantity of fish of suitable quality for export is comparatively low but the traditional methods of drying fish and producing fish sauce probably reduces waste.

Seaprodex, the National Union of Viet Nam Fishery Producers and Import-Export Corporation is the umbrella organization for the fish processing industry. It is also the owner of 12 out of the total 65 food processing plants in the fishery sector. Technical assistance to the entire fish industry is provided by Seaprodex which is also responsible for overall production and investment plans. Export of fish products is done through Seaprodex which is also an importer.

The processing of seafood prior to freezing (total output: approximately 100,000 t/y) is entirely manual. Quality control is carried out from random samples of the final product but not on the line. Canning of fish on a pilot scale has been established with the assistance of UNIDO. This product is intended mainly for the domestic market. The local cottage type processing supplies semi-finished products to the dried fish industry. Annual output is at least 15,000 tonnes per year. Fish sauce is processed in the traditional manner using mostly trash fish. It has been estimated that the annual production approaches 100,000 tonnes per year.

These small-scale ventures are mostly private, some are co-operatives. They are important as suppliers of semi-finished dried products but also as providers of a large number of jobs and a reliable income to small-scale entrepreneurs.

Better exploitation of resources, creation of jobs, provision of sufficient food and processing of products for export are guiding future action. Expansion of international economic relations is, however, hampered by the lack of competitiveness and market awareness of Vietnamese enterprises. Quality, product range and information extension networks will have to be drastically improved.

So far, development measures have not benefitted from a strategic plan for fisheries. Industrial investments have been made on an ad hoc basis in areas believed to be most urgently in need of improvement. It is therefore essential that a sector study be made at the earliest possible occasion.

(d) Forest-based industries

Of the area considered forest land, only 50 per cent (7.8 million hectare) actually carries trees, the total quantity being estimated at 566 million m³. The afforestation programme hitherto has covered 160,000 hectares annually planted eucalyptus or bamboo. Until the year 2000, industrial planting is intended to be increased to a maximum of 200,000 hectares per year. It is expected that agro-forestry eucalyptus plantations will be

harvested after 10 years followed by about three crops with 8-year intervals. In addition, private sector (village) afforestation will cover about 200,000 hectare annually.

Annual felling amounts to 1.5 million m³. Most of it is processed to sawn wood. The existing plans envisage the annual felling to increase to 2.5 million m³ in 1995 and 4.2 million m³ in the year 2000. The plan target quantities may not prove realistic. Natural resources are below the limits necessary for sustained productivity and environmental protection. The plantation survival rate is estimated at 40 per cent. Natural forestry resources are reportedly being lost, or badly degraded, at a rate of 150,000 to 200,000 hectares per year. In addition, limited sampling suggests that the volume of the standing timber is decreasing at a rate of 7 per cent per year due to overcutting. Logging and transport equipment are in short supply and reportedly not properly used or maintained.

There are 600 saw mills in Viet Nam with a capacity of 2,000-3,000 m³/year for each unit if operated two shifts per day. Studies by FAO of the saw mills in Viet Nam concluded that "all saw mills seen are in a very poor condition. The majority of mills are beyond economical use". The industry suffers from a lack of standardization, high wastage, deficient transport and lack of planning. The present output from the saw mills indicates that they generally operate during one shift at best.

The pulp and paper industry under the Ministry of Light Industry has a total capacity of about 200,000 tonnes/year, enough to produce 3 kg/capita per year, but the present overall capacity utilization of the pulp and paper industry is about 50 per cent. The industry suffers from raw material shortages, like several of the other forest-based industries. In addition, the supply of essential chemicals is irregular and insufficient.

There are various plywood, veneer and chipboard plants in the country. Plywood is produced in three plants, each with a capacity of 6,000 m³ timber input per year. The present capacity utilization is 30 per cent mainly due to shortage of timber. This may be associated with logging, transport and/or planning problems. Other contributing reasons are general shortage or insufficient size of logs and lack of spare parts.

Little information exists on secondary wood industries, like furniture. The plants are known to have inefficient production lines and are generally equipped with old machinery. It appears, however, that they are frequently operated quite successfully. But the production lines as a whole are in need of rehabilitation, using the existing machines whenever possible. Modern concepts of material handling and process flow would have to be introduced and considerable effort should be directed towards improved design and assembling systems to attract a wider international market. Co-operation with overseas furniture manufacturing companies could be of mutual interest in this branch.

In order to utilize the limited forestry resources better, also in a short-term perspective, rehabilitation of existing saw mills, including replacement of some equipment, is urgently needed. In the longer term, the forest-based industries need more realistic planning, i.e. planning based on the concept of ecologically sustainable rates of forest exploitation.

3.3 Textile and clothing

(a) Introduction

The textile and clothing industry is Viet Nam's second largest, contributing 15.4 per cent to gross industrial production in 1989 and employing some 625,000 people, apart from unregistered employment in small-scale production. Together with the co-operatives and small firms it currently, according to official figures, includes some 4,600 firms with a strong emphasis on textiles (see Table 3.4). The domestic supply of cloth is not sufficient. Since Viet Nam will have an estimated population of 80 million by the year 2000, covering domestic demand is a major challenge for the present decade. Moreover, export prospects seem to be good, and exploiting this opportunity will also demand large investments and improvements in production.

Table 3.4. Key data of the textile sector, selected years

	Textiles			Clothing		
	1980	1987	1988	1980	1987	1988
Total output (million 1982 dong)	8,190.6	15,988.7	17,219.1	1,785.9	2,765.0	4,048.9
Public sector: Share in total output in public sector	13.1	14.2	13.7	1.9	1.9	2.7
Private/co-op. sector Share in total output in private/co-op. sector	10.9	11.6	10.9	3.8	2.8	3.3
Employment in public enterprises (1,000)	80.0	110.4	115.5	25.8	38.1	47.1
Employment in private/ co-op enterprises (1,000)	277.7	385.5	395.9	61.0	93.5	105.7
Investments public sector (million current dong)	-	2,578.0	11,533.0	-	1,230.0	4,245.0
No. of public enterp.	99.0	118.0	121.0	59.0	72.0	77.0
No. of co-op./private enterprises	-	2,822.0	3,035.0	-	1,610.0	1,094.0

Source: Statistical data of the Socialist Republic of Viet Nam, 1976-1989.

The textile and clothing industry is the country's largest foreign exchange earner. In 1989, total exports were estimated to reach 193 million rubles/US \$. Most of the foreign exchange earnings, however, are in non-convertible rubles. Clothing accounts for over 80 per cent of the foreign exchange earnings, and accounts for 30 per cent of branch production. In 1988, the share of exports to socialist countries was 95 per cent, but it is estimated that in 1989 the share declined to 90 per cent. In the exports to market economy countries (limited by quota restrictions) Canada and FRG have the largest share, followed by several Southeast Asian developing countries.

On the import side, Viet Nam gets large supplies of cotton from the Soviet Union. In 1989, total cotton imports were 51,400 tonnes, down from 65,000 tonnes in 1987. In addition, the country imports large quantities of cotton yarn and artificial fibre. Imports of synthetic fibre come mainly from Japan (and, indirectly, from the USA) and to a lesser extent from the FRG and Switzerland. Of the socialist countries, Poland was the most important supplier. In 1989, textile machinery imports amounted to about \$6 million. India, Japan, Republic of Korea and Taiwan Province of China are the main suppliers. About \$1.8 million is, however, spent on imports of spare parts although there is local production of spares; some equipment is also produced locally.

(b) The raw material basis

Viet Nam possesses some of the most favourable conditions for cotton growing in all Southeast Asia. However, only 1,000 sq. m. of cultivable land per person is available now to meet the needs for both food and clothing. With a growing population and the need to conserve or restore forest areas, the amount of cultivable land per capita is unlikely to grow. Research is therefore undertaken to find new ways of improving the textile raw materials base. In 1989, the entire area under cotton cultivation will have reached 15,000 hectare, but it is spread in very small lots across the country, and yields are very low by international standards. It may be possible to reach a total area of about 30,000 hectare, but the necessary capital investment per hectare is assessed at \$100 and in addition machinery totalling some \$350,000 would have to be purchased.

Total production of raw silk is about 125 tonnes per year. Relatively low prices in the last few years - in addition to unfavourable breeding conditions - have led to a decline in the area of mulberry trees, to a level of 6,000 hectare in 1988. Strong promotion of silk growing is foreseen in government plans and is expected to help cover the needs of the textile industry and to create urgently needed jobs. Plans call for a rapid increase of the area under cultivation. Already in 1990 production is expected to quadruple. By the year 2000, production of silk is to reach 1,000 tonnes. This does not seem realistic; the figure should be reduced by some 50 per cent. Moreover, the industry also needs new equipment if it is to produce better-quality silk. New spooling machines, e.g., with a value of US \$1.2 million would be required.

Negotiations are in progress between Japan and the Union of Textile Enterprises over a joint venture for the production of white silk from tapioca. The project involves a capital volume of \$10-15 million. In the centre of Viet Nam (Binh-Dinh, Thuan Hai) and in the South (Phu Khanh), a large area is to be made available for this project. It would create many jobs, and full production would yield 7,000-8,000 tonnes. Viet Nam lacks,

however, the required equipment. The precise extent of processing in Viet Nam has not been decided on yet.

The country also has trees that could be used as a source material for production of cellulose viscose, of which 37,000 tonnes per year could be produced. Plans exist to set up a joint venture in 1995 with India and the Soviet Union, with production scheduled to begin after the year 2000. For most of the projected production, however, no financing is available yet.

The exploration of gas and oil resources in Viet Nam have stimulated the discussion on starting synthetic fibre production. There are, however, no concrete prospects for synthetic fibres before the year 2000. A refinery may be in operation by 1995. In 1998 a petrochemical complex is apparently scheduled to begin production with a yearly production of the required raw materials. Even if this plan is realized, however, no polyester will be manufactured before the year 2000.

Contacts with Japan were apparently established already in the early 1980s for supplies to Viet Nam of 11,000 tonnes of polyester per year starting in 1995. Initial contacts have been made with the Taiwan Province of China regarding a project for polyester production. For the production of vinyl and polyacrylnitrile some of the necessary raw materials such as coal and limestone are apparently available. Plans exist for a project with the Democratic Republic of Korea to be completed in 1995. A project is also being discussed with Poland for the production of polyacrylnitrile. Important basic materials such as methanol, formalin and acetamide are, however, not available.

The option is thus whether to produce both synthetic fibres and the necessary basic materials, in connection with a joint venture (after the year 2000) or to import the chemical raw materials and produce only the fibres. The latter alternative could be already implemented before the year 2000.

On the basis of available information, the following suggestions can be put forward for consideration with regard to raw materials:

- Preparation of a detailed study on the existing resources for textile materials and textile chemicals; prospects for cotton and silk growing;
- Research on the elimination of chemicals and pesticides in cotton growing to the extent that this is possible;
- Research on possibilities for production of viscose from other types of wood, rice straw, sugar cane, etc.;
- Research on the possibilities of using ramie and other materials such as from coconut-tree, rubber, feathers and reptile and fish leather;
- Investment in cotton gins and cotton pressing machines to better use the existing production of cotton;
- Investment in spooling and drying machines for silk production.

(c) The textile industry

The textile industry is - after the food industry - the strongest single branch of the economy, accounting for 12.4 per cent of gross output in 1989. The majority of textile factories are relatively small, employing less than 500 workers. Nearly all machines are older than 10 years, and the majority is older than 20 years: only the spinning mills, which are almost all run by the state, and a small knitwear sector show some degree of modernization. The spinning mills have a potential capacity of 80,000 tonnes per year. In the weaving sector, production is 450 million metres per year. In the dyeing and printing works, the capacity stands at 400 million metres per year. The knitwear factories have a capacity of 2,000 tonnes or 20 million pieces per year. Fifty per cent of knitting production comes from the co-operatives.

Plans have been formulated to modernize the spinning mills, the dyeing plants and the knitwear factories. It is also envisaged to better target the markets, gather more information on prices and raw materials, and improve procurement.

More and more textile companies are setting up their own production lines for production of clothing. This is motivated, on the one hand, by the desire to utilize synergy effects of the company resources, and on the other hand, by the relatively low investment costs in clothing as compared to the production of textiles.

In the modernization and adjustment of the textile industry to the international market, an important role is expected to be played by joint ventures with foreign companies. A number of joint venture agreements has been concluded in recent years, or are being negotiated. It is expected that because of its economic dynamism and its special locational advantages, such as the proximity to an international harbour, Ho Chi Minh City will play a major role in the future development of the Vietnamese textile industry.

On the basis of the information available on the spinning industry the following suggestions can be put forward:

- A study of trends in the material composition of fabrics in the world market followed by research of the possibilities and implications of upgrading quality in production and the introduction of new blends;
- Studies of scope and approach for increasing productivity and competitiveness;
- Measures to improve the work and health conditions in the spinning sector;
- Research on diminishing the use of chemicals in cotton spinning to produce "healthy cloth";
- Improvement of production by better maintenance of the existing equipment;
- Improved quality control;
- Investment in humidity plants and dyeing facilities;

- Incentives for starting up specialized medium and small-size firms in the spinning sector;
- Improvement of marketing in the spinning sector (domestic and international);
- Improvement of fashion knowledge in the spinning sector (especially in the choice of blends and the colours for dyeing).

For the weaving industry, the following suggestions are put forward:

- Examination of possibilities to upgrade product quality, of introducing new blends and of the consequences for machines and skills;
- Research on improving the work and health conditions in the weaving industry;
- Improved marketing (domestic and international) and more efficient purchases of yarns, machines and spare parts;
- Improvement of fashion awareness and response (especially in the choice of patterns and colours for dyeing).

Dyeing, printing and finishing are generally characterized by very old machines and insufficient capability to meet market demand. There are only a few specialized plants. Special problems are weak printing and finishing; pollution; poor working conditions; and lack of information on international standards. Opportunities for increased exports seem to exist for improved fabrics.

It is suggested that a detailed study be undertaken on rehabilitation, modernization and expansion of this industrial activity.

The knitting industry is underdeveloped. Its special problems are low quality of material; weak design and marketing; large investment needs; lack of information on international markets. The advantages seem to be a good workforce; and a long tradition of embroidery.

The following suggestions can be put forward for consideration:

- Detailed subsector study on development possibilities in the knitting sector at central, local, private and handicraft levels; in particular, the prospects for knitted underwear combined with embroidery;
- Research of the possibilities to improve processing (dyeing, printing, finishing) in the knitting sector;
- Market research of future world market trends in the materials composition of knitting;
- Improvement of marketing;
- Feasibility studies on investment in new knitting and embroidery machines;

- Incentives for establishing specialized medium- and small-firms in the knitting sector;
- Creation of trademarks for quality products;
- Development of national and international subcontracting.

(d) The clothing industry

The clothing industry accounted for 3 per cent of gross industrial output in 1989, with the public enterprises dominating production. Over 38,000 persons were employed in 1988 (see Table 3.4), most factories employing less than 500 workers. Co-operatives and small firms employed about 106,000 persons in 1988. While the number of registered units decreased, there was a strong growth of employment. Most of the machines used in the sector are over 10 years old. Total production capacity in the public sector is listed at 70 million units. For 1989 there were orders for 60 million units, half of it for export. There is a small number of joint ventures, where it is difficult to distinguish between active and "silent" participation of Vietnamese abroad.

The procurement of material and accessories for high quality production poses particular problems. In most cases, the modern machines and spare parts that would ensure high quality production are lacking; research on fashion trends and markets hardly exists.

Other problems are the low product quality (shirts excepted); shortcomings in the accessory sector; lack of information on international standards and fashions. Special advantages seem to be a skilled low-cost workforce; high productivity and existing and prospective competitiveness.

On the basis of the available information, the following suggestions for the clothing industry are put forward:

- Detailed study to be carried out on prospects and constraints;
- Improved quality control;
- Improvement of marketing, including creation of trademarks for the best qualities;
- Improvement of design (especially in the choice of patterns and materials);
- Development of international subcontracting;
- Improved ready-made tailoring and search for export possibilities;
- Incentives for establishing specialized medium and small-scale firms.

(e) The textile/clothing trade system

The Vietnamese factories generally sell only to wholesalers. Clothing factories apparently buy textiles through the intermediary of wholesalers as well. Recently, limited direct factory sales to local retailers have been allowed. State-owned retail shops had, until recently, a monopoly. Now, co-operatives and private firms have taken over a large part of the market and virtually every owner of a sewing machine has become a retailer. Large public sector enterprises such as Textimex and Confectimex play a leading role in foreign trade in textiles and textile machinery. Liberalization, however, is making progress and the Chamber of Commerce is gaining more importance in the textile trade. Although the Ministry of Economic Co-operation retains final contract over exports, individual garment firms can now export directly, if two criteria are met: a lower limit of \$2 million and "familiarity with the corresponding export market". There is a growing tendency for firms to join together in order to reach the threshold value.

Barter transactions are important both for domestic and for foreign trade. Basically, transactions are preferred where the machines can be paid for with the goods produced by them. But to date this approach has not had much success. Of all the important textile partners in the region (Japan, Republic of Korea, Taiwan Province of China), the Taiwanese have shown the most interest and greatest prospects.

Special problems are the lack of information on markets and the actual marketing itself, in particular the international markets; and distortions in competition due to the dominant barter trade. The large domestic demand can, in the longer run, be a major growth factor.

The following suggestions are put forward:

- Exploration of scope for organizing (or participating in) special fairs in Viet Nam or abroad;
- Improvement of domestic and international marketing;
- Establishing a domestic Institute for Marketing and Market Research;
- Establishing centres for marketing research and distribution in selected countries, with the involvement of overseas Vietnamese;
- Establishing a specialized textile bank to provide quicker credits, and support to foreign trade, foreign investment and barter trade;
- Improving contacts to the GATT;
- Improving conditions in the transport and communication sector.

4. Small and medium-scale industries

As noted earlier, the development in the 1980s has been particularly fast in the small- and medium-scale industry (SMI) sector (including the handicrafts sector). SMI corresponds more or less with light industry, officially known in statistics as "group B" industries.

Many of these enterprises are medium-size industries, employing several hundred people and having yearly production values in the order of millions of dong. This is often the case in knitwear and garment manufacturing, in furniture production and in handicraft co-operatives, such as those producing jute carpets and bags. SMI is the type of industry typically found in the provinces.

There were in 1988 about 1,600 public industrial enterprises in "group B" and about 6,000 small industry/handicraft co-operatives. The total labour force in state enterprises in "group B" is over 350,000 people. 1.5-1.6 million persons are working in the small industry/handicraft sector, and 0.5 million in co-operatives in the agricultural area.

At present the total output of the small-scale and handicraft sector is about 60 billion Dong or on average 30,000 Dong per worker. This accounts for 43 per cent of the total industrial output and 60 per cent of all consumer goods turned out in Viet Nam. The total export value in 1988 was estimated at Rubles/US \$140 million which accounts for 18 per cent of total exports from Viet Nam. The sector thus contributes significantly to production for both local consumption and export.

An important part of the case for emphasizing small rural industries is their potential linkages with each other and with other sectors - particularly in comparison with, for example, import-substitution industries. Many rural industries, and other non-farm activities, cater for the local rural population so that, even without direct input-output linkages, they are demand-linked, their level depending directly on the level of agricultural incomes.

According to the new strategy formulated for this sector, 400,000 new jobs are to be created every year up to the year 2000. The production and export targets are as follows:

	Total output (billion Dong*)	Export (million Rubles/US\$)
1990	74	160
1995	140	320
2000	240	800
2005	320	n.a.

*in fixed prices

Given the fact that the gross output of the sector was just under 60 million dong in 1988 and the average annual growth rate in 1980-1988 just under 14 per cent, this would require a very large effort.

Most of the SMI sector is managed by local or provincial authorities. In the South the small industry sector under private ownership is relatively large, in the case of repair workshops and similar activities. There also exist many "joint ventures" in which the private partner carries out day-to-day management. A few of these joint ventures have foreign participation.

The small-scale and handicraft sector is dominated by co-operatives, and most of these are found in the South. The activities of all co-operatives are directed and controlled by the Central Council of Co-operatives and Non-Governmental Organizations (CCNGO). The Council also provides services in the fields of purchasing, marketing, management, technical assistance and training.

The co-operatives can set the wages for their workers themselves, in relation to sales proceeds. Each co-operative is managed by a team consisting of managers of different sections: production, supply, finance, accountancy, etc. Co-operatives usually produce goods in response to customers' orders. Sometimes the production is geared to subcontracting arrangements with public enterprises. Each co-operative can use its surplus work capacity for the production of goods for the free market.

The present constraints affecting co-operatives are similar to those encountered elsewhere, but the shortcomings in the small industry and co-operatives sector are compounded by the fact that, generally, there is no formal training for the development of skilled workers. Most workers are self-taught. There is a very limited number of technicians. The productive equipment is mostly self-made and often has deficiencies.

There is an unknown number of micro-enterprises, mainly engaged in household-level processing of crops, sewing, and similar activities. The number of these is apparently increasing rapidly. However, the threshold to small-scale industry is rarely crossed, it appears. This would partly be related to the fact that such activities are not the sole occupation (paid or unpaid) of a family or family member, but are carried out alongside other activities. They would usually not constitute the sole source of income, and there would often be no ambition to increase the scale of operations.

For those micro-entrepreneurs, who wish to expand their activities, the constraints are probably similar to those existing for small-scale industry, though they may even be more severe: no access to funding, deficient equipment, skills (including administrative and management skills) that are inadequate for production on an increased scale. It is likely that a disproportionately large number of women is involved in micro (household-level manufacturing), and that they are therefore also disproportionately affected by the obstacles to expansion.

The lack of precise information on micro-enterprises points to a need for more study to provide a basis for assistance to this particular segment of SMI. However, the very nature of micro-enterprise makes it unlikely that detailed studies fully covering these industries are possible. The overall improvement of the "enabling environment" for industry will probably go a long way to stimulating this type of activity. The same is true for other segments of SMI. Meanwhile, a number of suggestions for support can be formulated.

Promotion programmes have usually included a variety of supply-side measures, offered singly or as a package. For instance, credit facilities, industrial estates with supporting infrastructure, entrepreneurship development, skill training, and so forth, have been some of the measures used aimed at removing constraints on the production side.

In recent years, partly as a result of unfavourable experience with many of these components, it has been realized that supply-side initiatives on

their own may be ineffective unless there are favourable demand-side conditions and - as stated above - macro-economic policies that provide the enabling environment (taxation, credit and interest policies, etc.).

As regards skills training for the entrepreneur himself, or herself, this should have a clear objective and preferably be focused on a specific product or technique which has demonstrated potential. Both entrepreneurial and apprenticeship training may need to be linked with credit provision for the purchase of relevant equipment or tools. Special provisions may have to be made to stimulate female entrepreneurship. This, however, does not mean that a separate development path should be pursued in the case of women. Successful programmes will integrate women in the mainstream of industrial development.

It is essential to design provision of infrastructure separately to suit each category of industry. For micro-enterprises allocation of land for construction of buildings may be appropriate, where land is scarce. Very often there is spontaneous development of 'informal sector' agglomerations of workshops and enterprises of different kinds, and it may be better to improve services in these areas - water, power and sewerage, for instance - rather than attempt to create estates artificially.

Where small estate facilities are appropriately designed and located to accommodate clusters of 'informal sector' manufacturing establishments, a particular advantage which has emerged, is that dealers and other customers come to the cluster to make purchases, attracted by a concentration of workshops providing competition and choice of products. This allows enterprises to economize scarce funds, using the limited amount they have for working capital, without the problems of repayment associated with cash loans.

With regard to upgrading technologies, it can be pointed out that while regional circumstances and possibilities will vary, there exists an international 'shelf' of appropriate technologies on which it is sensible to draw first. For this purpose Viet Nam will need to set up a search capability, that is a domestic institutional mechanism, with international back-up, capable of identifying possibilities and testing their relevance and adaptability to local requirements. Disseminating these technologies could take place through agencies similar to agricultural extension services or via the producers of the equipment or product. Small-scale entrepreneurs are then provided with designs and technical assistance during initial production runs, as well as credit, assistance in marketing, etc. This ought to avoid any persistence in 'pushing' products that, however interesting, are not practical and therefore are non-marketable.

Credit generally should be made available in as decentralized a form as possible, making use of non-bank financial intermediaries (NGO's) where possible. These are often well represented at the local level and have a comparative advantage relative to the commercial banks in having closer knowledge of individual loanees' circumstances and thus in identifying and screening candidates. An advantage which they share with the banks is of not being viewed by producers as part of government. It should also be possible to encourage savings and loans associations for small industry. The extensive experience gathered with funding of small industries in, a.o. Indonesia should be studied in this context.

Subcontracting may be helpful to household producers in securing market outlets in urban areas, and even more in securing export markets for their products. Parent firms may have a role, moreover, in product identification or development, identifying products which might sell in overseas markets or new designs which would develop sales. In some cases it may be useful for households to form themselves into co-operative groups or associations to facilitate dealing with parent firms or communication with extension officers in relation to production techniques or product design and quality (technological upgrading).

On the whole, experience elsewhere shows that support to SMI is most successful if associations of SMI entrepreneurs are involved in the preparation and execution of support schemes. These associations should also be "self-help" organization; in fact they usually function best when their rationale is a specific collective activity of the members themselves, such as bulk purchases of raw materials. Such associations can also act as pressure groups vis à-vis authorities.

5. International trade in the context of manufacturing

International trade has always been a government monopoly in Viet Nam. However, decentralization and liberalization are under way. There were 22 locally managed enterprises undertaking import/export activities under the control of local governments (municipalities) in the late 1980s; most of these enterprises are in the South, particularly in Ho Chi Minh City. There are 28 centrally managed enterprises that are authorized to undertake import/export activities, under direct supervision of the Ministry of Foreign Trade.

During the mid-1980s export growth, in particular to the non-convertible area, was slow. By 1986, growth of total exports was 5 per cent. Exports recovered in 1987, and had more than doubled by 1989, in current prices.

As Table 3.5 shows, the market economies became the largest buyers of Vietnamese exports in 1989, and a further shift towards the market economies seems likely. Manufactured goods constitute a large share of Vietnamese exports. In most cases, they are light industry products, predominantly textiles. A large part of the agricultural and fisheries exports are also processed, but this is usually no more than rudimentary processing to allow transport, and much remains to be done to raise the MVA content of these exports.

On the import side, the centrally planned economies still predominate. With the rapid changes in Eastern Europe, however, the likely trend is towards lower imports from these countries, also because scarce convertible currency is becoming essential in trade with the East European countries. The most important import products are capital goods, transport equipment and fuel, and these are mainly provided by the (former) centrally planned economies. Acquiring a sufficient supply of these essential production goods will probably prove a major challenge during the next few years.

Table 3.5. Value of exports and imports, by country and commodity groups,
1980, 1986-1989
 (millions of current rubles/dollars)

	1980	1986	1987	1988	1989
EXPORTS					
By group of countries					
Socialist countries (mill.ruble)	225.9	438.9	487.9	590.7	844.0
Others (mill. dollar)	112.7	384.0	366.3	447.7	976.0
By Commodity sections					
Light industrial and handicraft goods	160.5	245.6	264.5	440.9	500.0
Agricultural products	116.2	329.2	355.9	348.5	725.0
Forest products	13.7	80.1	54.4	53.3	65.0
Aquatic products	11.3	103.9	132.0	134.3	180.0
Heavy industrial products & minerals	36.9	62.1	45.3	60.1	350.0
TOTAL	338.6	822.9	854.2	1,038.4	1,820.0
IMPORTS					
By group of countries					
Socialist countries(mill.ruble)	755.1	1,659.4	1,953.7	2,028.5	1,798.3
Others (mill. dollar)	559.1	495.7	501.4	728.2	645.4
By Commodity sections					
Capital goods & intermediates	999.8	1,867.0	2,104.3	2,390.6	2,193.7
Of which:					
Complete equipment	360.1	426.2	576.1	636.2	496.0
Machinery	178.4	174.6	167.2	194.1	180.0
Instruments & accessories	78.5	121.2	136.9	194.8	130.0
Fuel, raw materials	370.6	1,018.6	1,110.4	1,353.7	1,387.7
Consumer goods	315.4	288.1	350.8	366.1	250.0
TOTAL	1,314.2	2,155.1	2,455.1	2,756.7	2,443.7

Source: Statistical data of the Socialist Republic of Viet Nam, 1976-1989.

Chapter IV. ENERGY ISSUES AND THE OIL INDUSTRY IN VIET NAM

Viet Nam has various sources of energy for industry: coal, hydro-electricity and oil. Coal is the dominant source of industrial energy. Viet Nam has proven coal reserves of 3.0-3.5 billion tonnes, currently mined mainly in the north-eastern Quang Ninh province. Viet Nam's coal mining activity is seriously constrained by equipment failures and shortages, as a result of which only some 75 per cent of the existing coal mines' design capacity of 8.8 million tonnes per year can currently be utilized. Output is nevertheless more than sufficient to meet domestic demand, and much of the surplus of some 500,000 to 700,000 tonnes per year is exported to Japan and the Republic of Korea. Hydro-electricity reserves are considerable, being estimated at 70 billion kWh, but are only marginally exploited, although generation capacity is being expanded.

The reconstruction of Viet Nam's economy suggests that energy consumption could show a strong upward trend during the next decade; at present, per capita energy use is well below the average for Southeast Asia. The electricity development programme alone will require an estimated investment of \$4.5-5 billion up to 2005. While there is a large potential for the expansion of coal and hydropower-based energy supply, the following sections will concentrate on the oil industry, as its potential benefits to the Vietnamese economy - including export earnings - are possibly the largest.

In the present context, it is important to have a look at global and regional oil production and consumption patterns which could influence Viet Nam's policies for the oil industry. World demand for oil has been estimated to rise from 36.9 million b/d in 1988 to 40.6 million b/d in 2005. The largest growth in oil consumption is expected to take place in the developing countries, the forecast annual average growth rate for this group of countries being 3.3 per cent for the 1989-1995 period. By 2005, oil demand in the developing countries is projected to rise to 22.1 million b/d.

Demand projections are a function of many variables and of many complex lags. Among the central determinants of demand is price. Most analysts expect a gradual pick-up from the very low oil prices in the mid- to late 1980s, with prices by the end of the century being in a range of \$22 to \$35 per barrel (in 1988 prices). This compares to a low-point of \$16 reached in 1986. In real terms, oil prices are expected to stay well below their 1979/80 peak. One of the more recent analyses estimates that if oil prices in 1995 were \$30 rather than \$18, world oil demand would be around 5 per cent lower, and developing countries' demand would decrease by only 3.5 per cent. This indicates that the outlook for producers is relatively robust across a wide range of possible oil prices.

Another important factor in determining the world oil price trajectory is the level of reserves. There have been major upward revisions of the proved reserve figures, and the emergence of some powerful new exploration technologies. Total recoverable reserves of world oil have been revised from 650 billion barrels in 1986 to 890 billion barrels in 1988/89. Similarly, gas reserves have been revised upward to around 4,000 trillion cubic feet in 1988/89, and recoverable coal reserves were estimated at 1.1 trillion tonnes in 1988, up by no less than 80 per cent from the 1985 estimate. The main change lay in a major upward revision in China's reserves.

The Asia-Pacific region's reserves of crude oil are very varied by country, with nearly half of the total found in one country - Indonesia. The region possessed in 1988 2 per cent of the world total of proved reserves; China's reserves represent a further 1.5 per cent. Viet Nam's oil reserves are among the largest in the Southeast Asian subregion.

The Asian region is expected to exhibit the fastest growth rate of demand. The basic reasons for this are the continued growth of industrial output, population growth, and the expected slow real energy price rises. The number of automobiles is expected to grow from 8.2 million units in 1988 to 9.8 million units in 1995. Continued strong growth of demand in Japan will be a major source of this growth.

Fuel oil demand for electricity generation in Asia-Pacific is expected to fall by 12-13 per cent over the rest of the century. This would be due to increased use of coal and natural gas. Coal demand would rise from 237 million tonnes in 1987 to 605 million tonnes in 2000; over the same period, gas demand would rise from 1,679 billion cu.ft. to 3,015 billion cu.ft. Fuel oil demand would decrease from 84.5 million tonnes to 74.0 million tonnes.

Having examined the outlook for oil demand in the region, oil supply should now be considered. Exploration is proceeding at a fairly active pace in Asia. But despite the forecast growth of oil exploration and of refining capacity it appears highly likely that there will be continuing net inflows of both crude and refined products to the region. Table 4.1 shows a growing need for net oil inflows. Some 70 per cent of the inflows have so far been provided by countries in the Middle East. However, growing future needs will almost certainly outstrip aggregate OPEC supply capability.

Table 4.1. Asia-Pacific oil balance forecasts
(million b/d)

	1990	1995	2000
Regional demand	11.5	13.4	14.4
Regional supply	5.9	5.9	5.5
Net imports to region	5.6	7.5	8.9
Import dependence on Gulf region (percentage)	71.0	82.0	90.0

Source: Oil and Gas Journal, 24 July 1989, p.22.

The oil industry is among the most promising areas of the Vietnamese economy. Oil reserves are estimated at 20 million barrels; offshore exploration is expected to reveal up to 100 million barrels. The recent growth of crude oil output, reportedly from 1,000 b/d in 1986/87 to some 40,000 b/d in 1989, has boosted optimism considerably. By 1990/91 output could be running at 60,000 b/d (equivalent to 3 million tonnes/year), and even 120,000 b/d by 1993. The agreement signed between Petro-Viet Nam and Shell-Petrofina in 1988 and the liberalization of Viet Nam's foreign investment code stimulated the interest of foreign partners.

In 1988 and 1989, eight companies signed agreements for oil exploration, mostly of a 25-year duration. Moreover, a Spanish/Kuwaiti joint venture project intends to spend up to \$2 billion on infrastructure projects, including an oil refinery, urea and sodium monoglutamate plants. A joint Vietnamese - Soviet project suggests building a 3 million t/y refinery at Phu My. Currently, refining capacity is 40,000 t/y.

Both exploration and production, however, are confronted by certain obstacles:

- The oil geology of offshore Viet Nam is said to be complex and the oil waxy and with high paraffin content;
- Down-time on offshore rigs has been high, so that exploration time tables are typically overrun and budgets exceeded;
- The major source of investment so far, the Soviet State petroleum enterprise, is apparently unwilling to continue its commitment indefinitely, and in particular does not wish to fund much more refinery expansion.

Assuming an average annual GDP growth rate of 5 per cent leading to a 10 per cent annual growth rate in oil consumption (as slack production capacity is brought on stream again) over the 1986/87-1995 period, total oil demand in 1995 would amount to 64,300 b/d. A different projection taking account of developments in countries in the region with comparable per capita GDPs would come to 72,600 b/d by 1995. The figure assumes that the share of oil in total energy use will not change.

Within the petroleum product demand mix, the biggest categories are petrol, diesel and residual fuel for power generation. As the economy recovers in the years ahead, this mix of oil products demand will be a major factor in shaping refinery policy insofar as a refinery built to suit Viet Nam's offshore oil will only be able to match certain output mixes optimally. In general, turning Vietnamese heavy crude into light products such as motor gasoline could be inefficient.

Although there is an abundance of oil refining capacity in the Asian region, most of this capacity will probably be used for domestic needs. This would be one argument in favour of increased processing of Vietnamese crude, whether by expanding domestic refining capacity or by having it refined where surplus capacity exists. In the latter case, refiners outside the region may have to be sought, and the refining agreements, transport issues and end product price fluctuations may lead to complications.

Another argument is the potential for exports. Given the overall outlook, Viet Nam's prospects are likely to be propitious. This view is based on the following elements:

- Growth of industrial output in the Asian region is likely to remain considerably above the world average, putting continuous upward pressure on energy demand;
- The largest economy in the region, Japan, is a large energy importer and will remain so;

- A number of Asian oil producers, notably Indonesia and Malaysia, have lowered estimates of their oil reserves in recent years, while Thailand's oil finds have not grown at the rate once expected, and the Philippines remains a small producer. At current exploitation rates, only Brunei of the ASEAN group may have oil left after the year 2005;
- The ASEAN group's surplus of crude available for export has shrunk, bringing larger imports of both crude and refined products into the region.
- The political volatility of the Gulf region, the world's largest oil supplier, is likely to stimulate increased interest of Asian-Pacific countries in oil suppliers in their own region.

The only problem for a new producer in the region could be undercutting of prices by large refiners in the Middle East. A refinery of the size envisaged in Viet Nam might face a cost disadvantage compared to optimally-scaled refineries in the Middle East, but this in itself is not necessarily a determining factor.

The other factor which could constrain Viet Nam's prospects could be the suitability of its crude for transformation. As noted earlier, demand is growing disproportionately fast for light products, making heavy crudes less desirable as input to refineries. Even in the OPEC member states' refineries, only the big Middle East export refineries are thought to be flexible enough to meet this evolving demand mix.

Whether the focus of future expansion is the domestic market, or a combination of domestic supply and exports, the management aspects of the refining decisions facing Viet Nam's petroleum agencies would fall into the following categories:

- The relationship with foreign oil companies;
- Developing endogenously the skills needed to commission, run and market the output of a significantly larger refining capability;
- Coping with the exogenous shocks which inevitably occur in an industry subject to worldwide political and economic upsets;
- Maximizing the local benefits from investment in a capital-intensive, foreign exchange-intensive and foreign expertise-intensive business.

With regard to the latter point, it is important to have rough estimates of the amount of capital which will be committed to downstream projects, since this capital obviously has many alternative uses. Data from refinery expansion plans announced elsewhere in the world indicate that the projected Tuy Ha refinery would need an investment of around \$550 million. Of course, the scale of a refinery and its complexity (specifically, the output-mix desired from it vis-a-vis the crude inputs) dictate the precise costs, with operating costs per barrel decreasing strongly with increase in size. The refinery would also be heavily dependent for a long period of time on imported skills, equipment and chemicals. All these issues should be taken into consideration before an investment decision is taken.

A final matter for concern is the appropriate macroeconomic policy framework. Experience in many oil exporting countries suggests that oil exports can have a significant impact on other sectors of the economy. The exchange rate appreciation prompted by oil or gas exports often causes problems: if the exchange rate rises quickly it hits agricultural producers worse than industrial producers, since agricultural output is more easily substituted by cheap imports. Given the major role played by agriculture in the Vietnamese economy, the possible macroeconomic side effects of oil exports should therefore receive close attention.

The environment described above suggests that three basic options exist for Vietnamese policy-makers in planning their future involvement in oil refining.¹ Each of the three is now presented, with their pros and cons and the required action steps of each.

A first option is to do nothing beyond retaining refining capacity at its 1989 level. In this case, the volatility of refining margins is avoided, but obviously at the cost of foregoing the domestic value added derived from refining. Moreover, the high import dependence on imported oil products is a major factor of insecurity (price fluctuations, changes in the economy of the USSR - the greatest supplier - political instability in the Middle East). This option therefore appears unattractive.

A second option is to expand capacity to the point of domestic self-sufficiency. This has the merit of avoiding trading in crude and refined oil, but again foregoes value added potential. Complete self-sufficiency is of course rather hypothetical, given the wide range of oil derivatives needed and the fluctuations in demand. In practice, it is cheaper to import certain oil products, and to export such surpluses as may be available.

A more ambitious third strategy is to expand capacity well beyond foreseeable domestic needs, taking account of oil reserves. This is likely to lead to large foreign exchange earnings, but at the cost of opening up the economy to exogenous shocks through world oil price changes. In this case the fundamental policy choice is whether to ally with a major international oil refining company or not. If the former route is selected, the choice of a partner becomes an important issue. The following are the major points to note in this context:

- "Strategic partnership" with a major oil company reduces capital risks since the output of the refinery is likely to be presold through the partner's extensive sales network;
- Consistent management relations with the partner will have to be established from an early point. Experience suggests it is preferable to establish clear guidelines from the outset and have agreed dispute resolution procedures to follow.

¹ The issue of related petrochemicals industries is not dealt with here. As indicated above, fertilizer and sodium monoglutamate plants are to be set up under an Spanish/Kuwaiti joint venture. The viability of e.g. further expanding fertilizer production as a downstream option could be looked into. Fertilizer issues are described in Chapter III, under agro-industries. Synthetic fibres represent another option (see Chapter III, under textile industries).

Whether path two or three is pursued, there are a number of tasks which will help to shape the best policy towards the prospective partner:

- Monitoring global and regional energy balances: This will identify trends which could have a high positive impact on Viet Nam's oil prospects;
- Appraising prospective patterns: This will identify the companies with the marketing apparatus best-placed to help market refined products from Viet Nam. The optimum partner will be the one which can also offer assistance in setting up sales operations for domestically refined products;
- Searching for recent experiences in spin-off benefits, i.e. trying to learn from other countries' experiences in optimizing the spread of benefits from the oil refining sector to others in the economy.

These tasks should be embarked upon immediately, since they will prove useful irrespective of the precise development path chosen. At present, Vietnamese sources estimate that a refining capacity of 5-6 million tonnes/year would cover domestic demand. While it is more economical to build large refineries, the additional transport infrastructure and support facilities needed are considered an obstacle. Therefore, the present thinking favours 2 or 3 smaller refineries distributed over the country, but co-operating on essential issues. Given the large amounts of investment needed for processing facilities for the full range of derivatives, a rather narrow range of products would probably be opted for, supplemented by imports.

The bulk of the evidence however, suggests that Vietnamese refined oil faces attractive long-term prospects, so that in principle there is no case for restricting refinery development to providing for self-sufficiency. But as experience elsewhere has shown, it is very easy to mismanage the growth of oil-related developments. In the early days, at least, a major international partner could help launch Viet Nam into the international refined products economy and avoid problems that have arisen elsewhere.

Chapter V. SCIENCE AND TECHNOLOGY FOR INDUSTRIAL DEVELOPMENT

The international production system is undergoing a dramatic technological development through which competitive patterns and production and trade structures are rapidly changing. A country's future competitive strength will to a large extent be determined by its scientific and technological innovation capabilities. The issues addressed below in the context of Viet Nam's long-term industrial development strategy are:

- how the country is currently equipped with institutions and human resources in the field of science and technology;
- how these capacities are organized, managed and utilized;
- how future challenges could be met by improving overall capacities and efficiency.

Unfortunately, the overall national expenditure on R&D and the flow of funds within the Vietnamese R&D system cannot be assessed here due to lack of information. Therefore, no detailed comparisons of the economic functions of Vietnamese R&D and related activities and similar activities elsewhere can be made, and the application of the lessons learned in other countries will depend on a more thorough analysis of R&D in Viet Nam.

1. Size and institutional set-up

The national R&D system in Viet Nam consists of the following institutions:

- Laboratories and other R&D units under the various line ministries. In market economies these specialized units would correspond to industrial laboratories in firms or corporate structures. In Viet Nam, however, firms rarely have their own R&D facilities. In the past few years, the government has started to encourage industrial enterprises, regardless of their ownership, to facilitate in-house experimental development. However, there is no major policy shift in this direction yet.
- A number of university and other higher education establishments which perform research as part of their normal activities. Within the higher education sector there are also separate R&D institutes. Close functional relations between some of the university research and research at the National Science Centre (see below) have existed for a long time. Young scientists do research at the Centre for their PhD degrees. Attempts have also been made to set up a joint university/National Science Centre Laboratory, where researchers from both types of institutions work together, using common equipment.
- A small number of specialized R&D institutes at the national level. The most significant of these is the National Centre for Scientific Research of Viet Nam (usually abbreviated to National Science Centre). It does advanced basic research in two areas: mathematics and theoretical physics. In all other areas, the Centre is better described as a centre for applied research and experimental development.

In the mid-1980s, about 20,000 scientists and engineers (full-time equivalents) were involved in scientific and technological research activities in the first two of the three types of institutions mentioned. Taking account of the probable growth rates of the number of scientists, this means that Viet Nam is now employing some 25,000 scientist and engineers. Of these, two-thirds would work in the line ministries, while nearly 30 per cent would work in an academic setting (including university-level teaching). Many of those in the ministries would be doing economic research. Pure technological research, in other words, is only done by a small minority.

Table 5.1 shows that most of the post-graduate personnel had degrees in the fields of natural sciences and engineering. Their actual work, however, was seldom in these areas in the mid-1980s, as Table 5.2 shows, and more likely to be in teaching and economic research. Similar quantitative

Table 5.1. Composition of R&D personnel with postgraduate degrees, 1985
(in per cent)

Scientific field	
Natural sciences	35.3
Engineering	33.6
Medical sciences	5.8
Agricultural sciences	6.6
Social sciences	18.7
Total	100.0

Source: "National seminar on science and technology policy", Hanoi, 20-21 November 1986 (in Vietnamese).

Table 5.2. Allocation of R&D personnel (university graduates only) by economic sector, 1984
(in per cent)

Economic sector	
Education	32.0
Economic science	17.0
Medicine	9.0
Agriculture, forestry and fishery	7.2
Machinery building	7.0
Construction	6.4
Natural sciences	5.0
Others	16.4
Total	100.0

Source: "40 years of Development of Higher and Secondary Education", Report by the Ministry of Higher and Secondary Education, Hanoi, 1985, (in Vietnamese).

indicators for the distribution of supporting personnel in the mid-1980s are not available. There were 7,900 such workers in the mid-1980s; if auxiliary personnel such as secretaries, drivers, etc. are included, the number comes to 17,400.

Total government expenditure for R&D totalled 498 million dong in 1985, or 0.7 per cent of GDP. Only 6 per cent of this was channelled to academic research. The remaining bulk of the budget was divided equally between the line ministries and the national R&D institutions and some other specialized institutes. The best-staffed and best-equipped R&D institutes are therefore not found in industry or the universities, but in the government services sector.

Unfortunately, the economic base for Vietnamese R&D is being partially eroded as a consequence of economic problems. Limited access to international science and technology is also an obstacle. This has forced the R&D institutions, regardless of their main objectives, to move away from research towards experimental development work, testing and standardization, training, and even small-scale industrial production.

In the short-term perspective, this may be positive for the diffusion of existing technologies for industrial renewal. In the medium-term and long-term, however, a country needs a minimal capacity to generate its own technological and scientific progress, and advanced training in science-based technological fields.

Another problem is the lack of interaction between the various parts of the institutionalized R&D system. The components of the system operate very much on their own and there are administrative obstacles to co-operation. Given the small size of the research community, it should be possible, as an initial step, to connect the various parts of the R&D system through informal channels.

2. Training, information and organizational issues

The majority of the highly-qualified personnel in the National Science Center has received training in the USSR and other socialist countries. The next grouping are those trained only at Vietnamese institutions. A small number are educated in Western European countries, usually funded through fellowships. Multilateral institutions have been instrumental in giving additional high-level training. Most of the staff at universities and comparable higher-level institutions were trained in Viet Nam with some staff training in the USSR and the eastern European countries, where they have joined what corresponds to MA or PhD programmes. The USA, during the 1950s and 1960s, provided similar opportunities for persons in the southern regions. The overwhelming majority of R&D support personnel has been trained within the country.

For the further development of the country's R&D system it is necessary to improve the education and specialized training of R&D personnel, for Viet Nam still has a relatively low share of well-trained specialists at the top level. It might also be possible to attract a larger share of highly trained persons in academic and other important positions.

Recent figures with regard to secondary and tertiary education are not too encouraging, as Table 5.3 shows. While the population of school-going age increased, there has been a reduction of pupils in vocational and secondary technical education, although the teacher/student ratios have on the whole improved.

Table 5.3. Key data on the educational system, 1985/86 and 1988/89

	No. of establishments		No. of students		No. of teachers		Teacher/student ratio	
	1985/86	1988/89	1985/86	1988/89	1985/86	1988/89	1985/86	1988/89
Vocational training	...	237	154,100	119,100	7,301	6,433	21.1	18.5
Secondary-level technical training	298	267	147,100	138,600	11,400	10,700	12.9	13.0
Higher education ^{a/}	97	103	126,200	128,000	18,800	19,900	6.7	6.4

^{a/} All types.

Source: Statistical data of the Socialist Republic of Viet Nam.

To secure a better base for scientific and technological work, attention should not only be given to expanding the educational system. The R&D system's own system of regeneration must also be improved, *inter alia*, through a better organization of the training of young researchers. Special programmes should be designed to help universities or groups of universities and other research institutions to educate better R&D scientists and engineers. As in industrial countries, national agencies could stimulate local initiatives for a more diversified and formalized research training developing new specialties or combinations of specializations. Experiments with multi-disciplinary and policy-oriented research training should also be made. Internal mobility and migration of specialists between different types of research units should be stimulated.

The most serious limitation to the scientific development in Viet Nam is not the lack of funds, nor poor equipment, but the relative isolation from the international scientific community. Contacts between scientists and other R&D specialists outside the CMEA are few and restricted. The stimulation from abroad is weak. This needs to change, not only in the search of scientific results from abroad, but also in the attempts to search for technical stimuli in advanced industrial product areas.

At both the regional and international levels, Viet Nam should expand participation in postgraduate training of young researchers, and refreshment courses for highly-qualified specialists. Since the chances of Vietnamese researchers and other specialists to travel abroad are rare, they should be assisted financially to broaden their international contacts, also in areas outside of but related to their original field of training. In this context, it should become a government task to stimulate the formation of both national and South-East Asian associations of specialists in different technological fields and sectors of society.

National associations could help consolidate already existing contact networks within the country. These professional associations could also facilitate migration by specialists between industries and between sectors, so that the present concentration of highly qualified manpower to the metropolitan areas of Hanoi and Ho Chi Minh City would be less strong. They could also serve as a platform for international contacts and assist in designing and implementing specific policies for innovation. Accordingly, the government should provide not only minimum funding to secure continuity in the routine activities of the associations, but also economic incentives to engage the members in a variety of policy-supporting services.

3. Policy issues

The key instrument for creating a national R&D policy and co-ordinating the sectoral interests is the State Commission for Science and Technology. Its prime function is to make plans for scientific and technological development for the entire country, regardless of sectoral interests. Its responsibilities include the overall control of major R&D programmes and projects, preparing laws on science and technology, and international co-operation. The Institute for Science and Technology Strategy which is formally part of the Commission advises the Council of Ministers. Systematic introduction of foreign technology has not yet received much attention although the transfer of technology and know-how is being facilitated.

The Commission has very little to say on the actual finance of R&D. The Ministry of Finance provides detailed instructions that may very well change the Commission priorities, even for projects that receive funding from abroad.

Within the State Commission for Science and Technology, the biggest single unit is the Institute for Science Management. This is both an administrative and policy-generating institute, which has its own company for economic consulting and engineering to complete its normal activities within the government structure. The engineering company, called Concetti, signed its first contracts with industry in 1988 and has established links with engineering and other consultancy firms in industrial countries. It follows initiatives taken by the Ho Chi Minh City government's Industrial Service Department, which has stimulated the creation of a large engineering programme, called Technology and Development, involving nearly 300 engineers, economists and other specialists on a part-time or full-time basis in the southern provinces of Viet Nam.

Among policy-makers in Viet Nam, a radical shift in the industrial R&D structure is being considered. The equipment and personnel of many of the R&D institutions and units under the sectoral ministries would be transferred to individual enterprises, integrating R&D with the companies. But such new arrangements might be premature. The industrial enterprises would probably not be ready to use the new expertise in optimal ways, and other firms would not have R&D specialists (the numbers being limited) and lose the facilities now available at the branch level.

A better way would be to support some of the technically most advanced enterprises in setting up their own engineering facility, or even a small R&D department. The experience gained from such specific experiments could help to prepare a long-term policy shift. Otherwise industrial R&D and related activities should continue to be carried out by improved R&D units in each

ministerial sector. Research closely related to sector and subsector plans and accompanying industrial investments by the individual ministry can compensate for the lack of R&D and engineering capacity within the enterprises. The focus should be widened from improvements in the industrial production to the generation of new products.

What is lacking so far are systematic efforts to create a coherent policy to promote the use of modern technologies in industry. This would include a number of practical measures which could help to improve the situation fairly quickly:

- Better utilization of the available qualified manpower in the industrial firms through re-organization, specialized units for maintenance and experimental development, in-house training of technicians, etc.;
- Pricing policies, which stimulate the use of new technology (the usual "cost plus" pricing method does not encourage the search for more efficient technologies);
- Removing administrative and financial barriers to technological improvements which are due to centralized banking and foreign currency control.

In spite of its shortcomings, the present policy framework is already providing a number of positive stimuli. Individual companies are beginning to seek long-term contacts with groups of R&D scientists in one of the industrial research units. In this way, the establishment of costly separate units in the firm can be avoided, while the flexibility and other benefits of an advanced engineering (and research) capacity are kept. This type of structure, which resembles French models, can become an important part of the country's technological progress if properly organized and commercially operated.

4. Linking research and industrial innovation

In many industrial countries, science or research parks represent an attempt to couple scientific and technological activities. Providing facilities for technology-intensive enterprises near a technical university or research centre can stimulate the development of new products and processes through intensified contacts. This has often led to a spectacular growth of industrial activities in certain areas.

Few developing countries have established science parks so far. Taiwan Province of China has been the most successful: its Hsinchu Science Park has attracted more than 70 research-based companies (both foreign and domestic), predominantly in the electronics branch, within seven years. Another example is the Republic of Korea. There, the focus is more on the interaction between large public and private research institutes and related industrial production in a so-called Science Town (located in Daeduk).

While in the more advanced developing countries these arrangements aim at accelerating the transformation of their industrial structure towards research-intensive, high-tech areas of industrial production, less sophisticated production technologies will play a more dominant role in Viet

Nam in the foreseeable future. It is, however, proposed to study the feasibility of setting up science parks or towns with foreign support, for industry could greatly benefit from closer links to research. The efficiency of the available technological resources could be increased by pooling them and defining priority areas for future research and commercialization efforts. One promising area would be the natural resource-based industries (processing of minerals and agricultural raw materials).

The establishment of viable and productive industry-research links involves a long-term commitment: they may bear fruit only in 5-10 years, and involve additional investment in the educational field, and highly competent and motivated management. It is suggested to locate experimental science-industry conglomerates in or near cities outside the two metropolitan areas, in the centre of the country. In this way, they could contribute to a wider diffusion of industrial development and a reduction of polarities.

5. Changing the policy framework

Planning and policy-making concerning R&D and innovation in Viet Nam is still highly centralized and closely linked to formal hierarchies. Efforts should be made to make decision-making more open and transparent so that decisions are taken on the basis of more informed and diversified knowledge.

More systematic attempts should be made to learn from the experience of planned technical changes in other countries, selectively adopting technologies for areas where Vietnamese scientific and technological capacities are still weak and the economic potential is high. The system of quality control, metrology and standardization should be improved as part of a long-term strategy for general improvement in the environment for industrial innovation and for reception of foreign technology.

Monitoring and diffusing international technological and scientific developments to the Vietnamese research and development community requires specialists and access to some of the major international centres for R&D. Viet Nam could probably use its compatriots studying or working abroad to form networks for this purpose, as has been done by Japan and the USA. Priority should be given to participation by Vietnamese scholars in international scientific collaboration, e.g. through close working relationships at research institutions in other countries, both in the South-East Asian region and elsewhere. Given the limited foreign currency available funding should be channelled to those areas in which the Vietnamese scientific community is already strong. In this context, a series of specialized scientific symposia could be arranged in Viet Nam with international participants and the issue of increased international co-operation should also be addressed.

PART III

ELEMENTS FOR A NEW INDUSTRIAL STRATEGY FOR VIET NAM

Chapter I. OBSERVATIONS AND ISSUES

When the available information on Viet Nam's manufacturing sector and policies is evaluated against the background of other countries' industrial strategies and performance, a number of observations can be made. These observations are admittedly sketchy and they should therefore be seen as a first impulse for further thinking and deeper analysis.

The observations are presented in two sections. The first concerns overall economic and industrial issues and the second plant level issues. Obviously these are two levels of discussion of the same problem and therefore they should be seen as inter-linked. The plant-level discussion is admittedly based on observations in a small number of plants by UNIDO missions. But it is felt that some of the problems witnessed there are common to many enterprises.

1. Structural and decision-making issues

The first major observation is the prevalence of severe supply problems in all sectors. Agricultural products, manufactures and infrastructure are not available in sufficient quantities to permit the launching of a more dynamic growth process. On the other hand, the country is richly endowed with raw materials, has a motivated and skilled human resources base and has good prospects for increased food production and food products exports. Manufacturing should be able to assume a key role in providing inputs for the agricultural sector and processing its products. At present, it is not fulfilling this role satisfactorily, both in terms of quantity or quality.

In international comparison, the performance of installed manufacturing capacities is very weak, because of obsolete equipment, poor organizational structures, lack of maintenance and repair, lack of cost and quality consciousness. Few efforts are made to increase the technological level of products and production processes. Some underlying issues at the policy-making level are discussed below.

So far policy-makers have mainly tried to relieve supply problems by creating new production capacities, mainly in the basic industries subsectors, and by installing new equipment in operating plants. This seems to disregard the high opportunity costs of new heavy investment with long gestation periods as compared with reinvestment in existing key enterprises, and the potentially very high returns of rehabilitation and modernization programmes for operating plants. Moreover, without comprehensive rehabilitation as well as a built-in, continuous cost-efficiency control system (including preventive maintenance), the installation of new pieces of equipment could prove uneconomic and possibly even counter-productive. Existing production units are already inefficient, with inappropriate investments and large operational deficits. Capital destruction would continue if existing, installed capacities are not utilized and maintained in an optimum way. The scarce financial, energy and raw material resources should not be allocated on the basis of quantitative

targets, but according to the principles of economic returns through efficient use of inputs (energy, raw materials) - the latter also to reduce negative impacts of manufacturing on the natural environment.

In this context, Viet Nam's strong orientation towards large-scale projects and basic industries is not optimal. The long gestation periods, high capital intensity, and large import content of investment and production may often aggravate rather than alleviate structural and supply problems.

In many cases, moreover, investment projects and equipment procurement seem to lack a careful choice and selection of equipment and technology. It is doubtful if precise calculations of alternative production processes and equipment were undertaken in terms of investment costs, maintenance and repair costs, and performance in terms of economic criteria. Many agro-processing plants, for example, suffer from over- or under-investment. New but outdated equipment and obsolete know-how has often been purchased from foreign suppliers, the availability of a credit line possibly being the only criterion for selection rather than an awareness of cost-efficient technological and supply alternatives.

There is little dynamism in the industrial sector when it comes to pursuing technological improvements. The large public enterprises could have a lead role in technology but they have too little leeway to act independently. The structure of government policy and decision-making with regard to resource allocation and operational matters of industrial enterprises is highly relevant in this context. Even when an investing company has identified suitable equipment, it is faced with severe administrative obstacles.

A very large number of officials is directly involved in the decision-making processes relating to industry - ministries, enterprise managers, planners and others. There seems to be little transparency in these processes and it is difficult to establish which part of the system is finally responsible for decisions. Officials moreover seem to know little about requirements, preferences and the responses of consumers (or end-users), and production results are not scrutinized in terms of costs. As a result, allocations are more the outcome of struggles between major enterprises and between the various ministries than decisions based on cost-benefit analyses. Decision-making is extremely time-consuming; this affects not only the domestic companies, their investments and production (and thus the supply situation of the country) but also results in under-utilization of foreign loans and other co-operation offered to Viet Nam. All this is at odds with the increased international orientation of Viet Nam's industry (and of the economy in general) which will necessitate quick decisions based on economic criteria to enable the country's productive system to respond timely and utilize emerging opportunities.

In the field of finance, finally, further development is hindered by the inability of most enterprises to finance expansion internally and by the limitation of the current banking system. The banking system is centrally controlled and seems to handle transactions as an administrative duty rather than as a supporting service to entrepreneurial activities.

2. Industrial integration

A major feature of the Vietnamese industrial sector is the low degree of integration both within the sector and with other sectors. In some other Southeast Asian countries (and certainly in industrially advanced countries) a major factor of competitive strength and efficiency of the manufacturing sector is the dense network of specialized industrial enterprises - small-, medium- and large-scale. This industrial integration makes it possible to fully exploit the domestic market dynamics and the mutually supporting impulses for technological and organizational improvements.

In Viet Nam there seems to be a lack of communication and exchange between industrial companies. Beyond what has been administratively conceived through the central planning system, few linkages seem to exist. Enterprises do not seem to actively search for new opportunities to exchange products, parts and components. In the capital goods industry, many Vietnamese enterprises seem to have the technical capacity to produce a range of general purpose and also specialized machines for the domestic market. However, opportunities for such deliveries are foregone due to lack of communication and - above all - the deliveries of complete plants and equipment through foreign assistance agreements. Better domestic engineering consultancy capacities could improve this situation.

The communication and linkages between the agricultural and industrial sectors are also weak. These linkages need to be substantially strengthened in view of the importance of agriculture, its large need for equipment and other vital manufacturing inputs and the need for more industrial processing of agricultural products. In this context, the close relationship between primary resource processing and ecologically sustainable development should also be remembered.

A third dimension of integration are the linkages between the industrial production system and research and development. The existing and potential R&D capabilities of academic and other research institutions in Viet Nam are not sufficiently utilized for upgrading technological processes and products in the manufacturing sector.

A fourth dimension is the regional development issue. Differences in tradition, commercial outlook, natural resource endowment and the geographical situation between provinces in northern and southern Viet Nam tend to cause a different entrepreneurial approach and behaviour. Undoubtedly the general business environment and business structures in the southern provinces are more conducive to entrepreneurial development, utilization of internal and external trade opportunities and the generation of industrial growth in consumer goods industries. As a consequence of new strategies and policy approaches as well as consumer-oriented industrial development, there is a high probability of more rapid industrialization in the south. This could aggravate the regional disparities. The geographical distance and the lack of physical infrastructure between the northern and southern provinces also constitute an obstacle. Counteracting centrifugal economic forces and building up complementarities therefore are a major issue for industrial strategy.

3. The foreign exchange shortage

The current shortage of foreign exchange is considered a major constraint to industrial production and development. Most enterprises are severely obstructed in their operations due to the problem of obtaining imported equipment, spare parts and raw materials. The vicious circle is well-known: increased export earnings can be attained only through more efficient production which in turn presupposes costly imports.

Keeping the importance of underlying macro-economic issues (such as import dependence and financial policies) in mind, this section will consider another, more "operational" issue; viz. the allocation of foreign exchange according to economic criteria.

In spite of the severe shortage of foreign exchange, there is widespread and apparently quite significant internal circulation and hoarding of foreign exchange. Industrial enterprises quote not only in Dong but also partly in US dollars and pursue the practice of "exporting (against dollars) on the domestic market". Enterprises thus attempt to obtain required foreign exchange from other Vietnamese enterprises to purchase part of the foreign inputs for which central allocations do not suffice.

In the context of an industrial strategy, the negative consequence of such more or less arbitrary exchanges must be addressed. Since no apparent reference is established to international prices nor to any other economic performance criteria, it is likely that productive enterprises are transferring and thus losing part of their value added, and/or that they underbill (some of) their products. Moreover, the acquired foreign exchange is not necessarily used according to economic cost/benefit criteria. Given the overall situation, the relative liberalization that allows provincial and local enterprises to decide on the use of part of their foreign exchange earnings does not necessarily contribute to economic development.

International co-operation - bilateral and multilateral - is an additional source of foreign inputs but there seems to be no development concept on which allocations could be based in a consistent manner. Moreover, foreign donors may largely determine the content of their own programmes and assistance projects, as indicated before.

The rational handling of foreign exchange will be a crucial issue in the new Five-Year Plan period. It has to be made consistent with the targets and general objectives set for industrialization and to be seen as a prerequisite for the industrial strategy. Allocation priorities should shift from large-scale projects with relatively large foreign inputs and long gestation periods to fostering inter-industrial linkages and improving enterprise performance according to economic criteria.

4. Plant level observations

The administrative and management framework

As pointed out, the decision-making framework for the company management is narrow. Companies do not seem to take major decisions about product mix, technology changes, prices, purchases etc. They seem to be cut off from market information and information about competition and new business

opportunities. The framework for the operation of the enterprises is essentially technical not economic. Enterprises do not relate costs to prices and can continue to operate with deficits (this is common in public firms). In the absence of motivation, the enterprises have no interest in searching for and adopting better solutions for various parts of the production process, unless it is a total renewal of equipment.

Wages and prices appear to be largely imposed, at least in the public sector. Prices are said to be fixed on the basis of technical norms, and accounting departments mainly do technical accounting. But the basis for those norms is unclear. If the norms are essentially based on past experience, two main questions arise: (i) to what extent can the firm benefit financially from any technical improvement and thus acquire an interest in making such improvements? (ii) What is the basis for upwards adaptation of these norms?

In the case of exports, prices appear imposed by the foreign partner rather than negotiated. Because of the absence of systematic cost accounting, the exporters do in any case not have at their disposal the necessary information to conduct such negotiations. The prices seem, generally, to be extremely low. This may partly reflect low real or perceived quality levels, but also the weak bargaining position of Vietnamese firms.

Most firms do not have a sales department, and deliver the products to some intermediate organizations; they lack any kind of seller/user relation. The firms moreover produce on the basis of norms set by the administration and cannot focus on the needs and experiences of the users. There is no competition. In such circumstances there can be little interest for the quality of the product, for improvements, for new designs etc.

The firms are under no pressure to care for systematic organization. They even seem to lack the necessary concepts for doing so. This affects technology (choices, degree of mastery), labour and work organization, learning, maintenance, quality, etc. In terms of available resources, there are no reasons why the production process is organized so inefficiently: the firms seem to have the necessary personnel and skills. Major improvements in performance should be possible under a system where the management is given freedom and responsibility.

Technical issues

Because of the long war period and of the actual economic situation, installed equipment is in most cases, very old. Equipment often has never been replaced. By present-day standards it is probably inefficient in its energy use. In some cases equipment which has been installed more recently is second-hand. Although this may seem a priori to be a good solution, the second-hand machines are also quite old. In the absence of information on the prices paid for this second-hand equipment, it is difficult to assess the costs and benefits of that kind of solution.

Generally the production techniques used are traditional and simple.¹ Plant management of firms visited by UNIDO missions was of the view that, given the necessary financial means, they would switch to more advanced technologies.

This raises questions concerning the choice of technology. Firms do not seem to have precise criteria for making such choices. Cost considerations are apparently not important. Instead, technical efficiency seems the main criterion. As indicated above, the prevailing problems cannot per se be overcome by installing new hardware. Besides, even with unsophisticated machinery companies are obviously not able to organize the production process satisfactorily way, and to maintain machinery.

Due to poor maintenance, the equipment and factory premises are generally in a rather poor shape. This is usually attributed to the difficulty in obtaining the necessary spare parts and materials. It is certainly not primarily a matter of deficient skills, but the main reasons really seem to be the absence of an organized maintenance system, and a lack of interest in solving technical problems, or even carrying out simple repairs.

Most visited plants, moreover, were very dirty. There does not seem to exist any cleaning system. Beside the psychological and hygienic consequences (safety and health regulations do not seem to exist or are not applied), it must be stressed that this general dirtiness has a negative impact on the materials used and thus on product quality. It also affects in many cases the maintenance and functioning of the equipment. In connection with this, it appears that environmental issues generally get little attention. This may result in negative consequences for the health of the population in the area (e.g. through smoke emissions) and also for other economic activities (e.g. where waste water poisons fish supplies).

Most plants lack properly organized production lines. The workers in most cases perform their tasks outside the framework of an organized chain of operations; as a consequence, each worker is doing his job without any reference (quality, time, etc.) to the possibilities and requirements of the other operations or to the end-product. One of the reasons why the production process is poorly organized is that the level of cost consciousness is very low (see above). Not surprisingly, waste is common.

Poor organization seems related to the near absence of middle-level shop-floor personnel. The causal relation may work both ways: because there is no formal organization of the production process, no foremen would be necessary to enforce this. On the other hand, the absence of foremen makes it next to impossible for such an organization to be implemented.

¹ Exceptions to this are some of the larger manufacturing plants established under international co-operation schemes, such as the Bai Bank paper mill.

Chapter II. POLICY SUGGESTIONS FOR THE SHORT- AND MEDIUM-TERM

The Government of Viet Nam is in the process of launching a new industrial strategy in which a revitalized industrial sector is expected to contribute significantly to higher overall economic growth. This presupposes a detailed stock-taking of industry's performance, prospects and constraints and a reassessment of the industrial policy framework in a longer-term time perspective and in an international context. Comparative studies of Vietnamese industry and international developments are needed. On this basis an industrial strategy and a supporting set of policy measures could be conceived.

Keeping in mind the importance of the longer-term perspective, a number of recommendations which could be implemented in the short- to medium-term are made below. They are necessarily sketchy and preliminary and presented in the form of a list of issues rather than as a design of a complete system. The chapter that follows will, however, present a suggested framework for the formulation of a longer-term strategy.

1. The enterprise level

Observations made at the plant level show that any significant improvement of performance and of capital utilization requires:

- Updating, upgrading and overhaul of installed equipment;
- Introduction and build-up of effective preventive maintenance and repair systems of equipment and premises;
- Adaptation/redesign of factory layouts, production lines and internal materials handling systems;
- Creation of quality awareness and effective quality control;
- Better cost accounting and control;
- Improvement of the physical working environment and application of safety rules, reduction of waste and pollution and increased awareness of ecological issues;
- Increase of managerial and entrepreneurial skills and responsibility.

To this end, it is essential to increase, through special financial and other incentives, skills, awareness and motivation. Specifically, training in business administration and technical issues must be improved. Foreign assistance could provide critical inputs in this context.

The logic on the basis of which the firms are functioning must be changed. Instead of referring to a series of stipulated rules the firms have to introduce and maintain a positive relationship between price and costs. This needs to be done through improving product specifications or quality and through improving efficiency and reducing costs. The firms will do so, of course, only if they are forced to, because of their responsibility to face some kind of (market) pressure, and/or because they are motivated by the

possibility to take advantage of any positive margin between price and costs. Business regulations must be further liberalized to allow the required degrees of freedom. To improve firm performance, systematic links with related activities should also be built up. This includes R&D, the relations with consumers or users, and marketing.

As a first step towards a more general process of improving plant performance, it is suggested that a limited number of plants be selected for detailed diagnosis and subsequent rehabilitation. The demonstration and learning effects of such a project could be considerable. The procedure may be as follows:

- Preliminary selection of, say, ten major agro-industrial plants which are of particular developmental importance;
- Review of these companies;
- Selection of some five priority companies;
- Detailed diagnosis of these through teams of specialists from international (multilateral) agencies and domestic consulting groups;
- On the basis of diagnostic reports, design of a detailed rehabilitation programme involving, inter alia, new investments, reorganization, maintenance systems, training, product adaptation, and market research. Basic prerequisites for government policy measures and other external support would also be defined;
- Consultation with foreign governments and firms to assist in implementing the rehabilitation programme.

2. Government - enterprise relations

To enhance efficiency and productivity throughout manufacturing and to dynamize the entire sector implies redefining relations between the Government administration and the firms. In this context the following issues should be taken up by policy-makers:

- Increased autonomy for decision-making and responsibility for risk-taking in companies;
- Guidance and inducement rather than special treatment of or interference in companies;
- A more targeted and performance-related employment system;
- The establishment and promotion of independent company audit firms and consultancy groups;

The objective would not be just to reduce direct state interventions and to increase the autonomy of the firms, but also to let the various actors concentrate on what they can best perform.

This implies that the administration move away from centralized determination of product quantities and prices, and that companies be allowed

to retain profits as an incentive to efficiency. Prices should reflect product quality and supply-demand relations so that they can be used as references for production decisions and cost calculations.

The institutional framework and physical infrastructure for enterprises must be improved. It is the responsibility of the State to care for the systematic development of a number of basic infrastructure resources and service activities, as private enterprise is not in a position to provide these. Private enterprises should however play a role where it can profitably do so, as - for example - in banking and trade/distribution. With regard to the latter it is worth noting that, in contrast to banking, a public agency is not considered essential in the vast majority of economies.

Improving physical infrastructure is a prerequisite for enhanced interindustrial and intersectoral relations and increased industrial efficiency and competitiveness. Taking account of geography, the improvement of North-South links in the country is especially important.

The next dimension is training. A better assessment is needed of the supply/demand conditions for various skills in the economy. A more dynamic outlook and response by the training system is a high priority to ensure a matching of skills supply with likely economic and technological developments.

Improved performance and expansion of industry also implies a new and increasing role for the banking system and, more generally, improved banking services for enterprises. Short-term and, more so, medium- and long-term banking credit is essential. This implies both responsibility and risk taking, and thus involvement in investment decisions for the banks. Freedom of action is again essential here.

In the field of finance foreign exchange management is needed to ensure access to imported inputs (raw materials and semi-manufactured products), equipment and spare parts which cannot be produced domestically or for which domestic production is not viable. At present, this is a major constraint. The principles and mechanisms for allocating foreign exchange among activities and enterprises and for transferring foreign exchange among enterprises need re-examining and revising.

At the national level, Viet Nam has already established institutions for standardization, measurements and testing. These are modelled after those of the industrial countries. A weakness is that their important functions are not widely known among industrial firms in Viet Nam. One precondition for a coherent industrial strategy is that the systematic promotion of standards and norms is given high priority.

A vital dimension of industrial production and competitiveness is research and development capacity and its integration with the production units. At this stage of Viet Nam's economic development, it is a task for the central government to help build proper R&D capacities and make them available to all types of firms. Already, there are examples, both in the south and in the north, but a wider variety of skills within these units is needed. The diffusion of experiences between different types of firms and the improvements in know-how among groupings of similar firms can be stimulated by better organization of (applied) R&D and better linkages with the industrial sector.

Having but a few advanced laboratories, Viet Nam has to give special attention to the diffusion of technology and know-how. Technical libraries, documentation centres, etc. seem to be well-staffed and, at least in some major areas, well-furnished with relevant documents. However, the procedures for supplying companies and other production units with information could probably be made more efficient. Documentalists should visit leading companies to get an impression of which type of information is usually needed. Company engineers and skilled technicians should be alerted to the fact that there are libraries which furnish technical information. Documentalists could also help to improve the communication between large industrial firms and laboratories and, later, extend their assistance to small- and medium-sized business firms.

There are some examples where high technology installations in traditional industries have proved to be technically successful. Having acquired expertise in several advanced technological areas, such as new materials, laser technology, and microelectronics, it could prove economically profitable in Viet Nam to screen existing large technical investments for bottlenecks in production, quality control, measurements, etc. and to apply advanced techniques to such problems. Complementing old equipment with new might also be possible. Such "in-house experimentation" would suit the usually limited financial resources and could, in the long run, serve as a starting point for R&D units.

It is also recommended that consideration be given to the systematic creation of domestic consulting engineering capacities, consisting of a centre for industrial technology and engineering and affiliate units across the country. Through this consultancy capacity, the significant know-how, and skilled people now available in the country, could be utilized to service industry, in particular in investment studies, choice of technological processes, equipment assessment and selection and technical advisory services to existing industries. Similar advisory services for management/organization and for maintenance would be needed. The services provided should be paid for by the companies concerned so that the consultancy agencies can become self-supportive. In the build-up period, however, a fund could be established and expertise provided by bilateral/multilateral assistance programmes. It may be possible to establish a twinning arrangement between the "Vietnamese Industrial Technology and Consulting Centre" and foreign relevant entities.

3. Need for a new industrial strategy

The above observations and recommendations point to the need to change the managerial and corporate behaviour of companies which now operate along monopolistic lines.

The process in which the autonomy and responsibility of individual enterprises is increased needs a time table and interrelated deregulation measures and changes in control mechanisms to ensure non-disruptive and consistent development.

One basic vehicle would be the design of an industrial strategy in which particular subsector approaches, regional approaches and macroeconomic issues can be simultaneously treated. Macroeconomic issues include the price system, the credit system, the foreign trade and exchange system, labour market matters, taxation, foreign direct investment regulations, etc. International

experience should be utilized to identify the required stages and timing of the deregulation process and the liberalization experience of other socialist countries should be studied. Chapter III of this Part provides a framework for formulating such a strategy.

As one particular medium-term measure, the creation of a special economic zone in Viet Nam could be considered. While it is true that employment in export processing zones (EPZs) and special economic zones worldwide accounts only for a negligible amount of overall industrial employment, in some countries they play a major role as industrial employers.

The experience of other Asian countries with EPZs should be studied in order to formulate a policy which maximizes the long-term advantages to Viet Nam. With many foreign investors eager to set up companies in Viet Nam, the country could take advantage of a very favourable international climate. The task ahead would be to clearly define the role of an EPZ in the national economy and to create a general atmosphere of reliability and stability as regards the terms and conditions for foreign investment. The new foreign investment laws are an important step in this direction.

Establishing a special economic zone would involve:

- (a) Creating a zone in which administrative procedures for industrial licences, foreign trade arrangements, etc. would be handled without red tape by a specially designed authority, which would also monitor the industrial investment and production activities;
- (b) Providing basic infrastructural facilities for export-oriented industries.

A successful EPZ would have a demonstration effect on foreign entities, inducing them to become more involved in the Vietnamese industrial process. There would also be a demonstration effect on the Vietnamese industrialists as to the efficient operation and costing of production. Finally, there is the possibility of attracting further resources from Vietnamese living abroad.

Locating such a zone in the middle of the country, such as the Da Nang area, would contribute to stimulating industrial growth outside the major urban areas in the North and South. The zone should eventually gradually be integrated in the domestic economy through sub-contracts and sub-deliveries.

Chapter III. A FRAMEWORK FOR FORMULATING AN INDUSTRIAL DEVELOPMENT STRATEGY

An industrial strategy can generally be described as an outline of a development course to reach set objectives over a period of 10-20 years by providing guidance to decision-making actors concerning resource mobilization and allocation. A strategy can thus be seen as providing a "vision" of the desired development process, and consistency for the measures to be taken. A strategy can be the basis for medium-term and short-term comprehensive development plans or a non-committal, general perception of prospects, challenges and desired responses by the various actors in the period concerned.

The main rationale for a strategic approach is, firstly, that the industrialization process is not spontaneous. Secondly, because of the low level of the country's development, resources are very scarce and the capabilities relatively low; therefore mobilization and co-ordination requirements are stronger. Thirdly, current market and price mechanisms can only to a limited extent serve as indicators for the decisions to be taken by the various actors in a longer time perspective. The state has, therefore, to define the preferred development path and to create the corresponding conditions. Fourthly, the strategy provides a vision and general framework for building up a broader and more systematic international co-operation for industrial development. Given the country's location, its vast resources, significant industrial and agricultural development potential as well as the large domestic market, there is a substantial and growing interest by foreign entities - public and private, academic and commercial - to take part in industrial development. This requires a clear vision of basic principles for industrial co-operation.

The type of strategy relevant or recommended for Viet Nam's industrial development will not be defined here. But an attempt is made to suggest a possible strategy framework to structure the above observations and recommendations and to specify the issues and options for which policy decisions will have to be taken. This section thereby also serves as a general guidance for the analytical work that subsequently will have to be carried out to enable such decisions.

1. Basic industrial strategy options

Viet Nam is a centrally planned economy based on socialism. Production is largely in the hands of the State and major inputs and outputs are defined according to five-year plans. A new four-year plan is currently being conceived to be covering the period 1991-1995.

The manufacturing industry sector was assigned a lead role in economic growth but has in recent years failed to attain the set objectives. Low capacity utilization, low productivity, little competitive strength and lack of innovation are the major problems. Industry did not generate a dynamic growth process, could not satisfy domestic demand and did not supply sufficient export earnings.

On the basis of the reassessment of economic policies initiated in 1986, the Government is also re-examining the framework for industrial development. With the obvious need to increase efficiency and growth of the sector, new

approaches and measures have to be conceived taking into account structural weaknesses and prospects and challenges in the domestic and foreign economies. To this end, an industrial strategy is formulated.

Building a strategy implies making choices between alternative goals for development. In principle, these fundamental choices are to be made by the political decision-makers. It is then the task of the economic planners to estimate the implications of these choices and to establish sub-systems which help to attain the chosen goal. In practice strategy-making is an iterative process in which policy-makers and planners make a series of assumptions and choices and adjust these according to constraints and the economic environment. A strategy therefore reflects a mix of views, assumptions and goals. The major strategy options are briefly illustrated below.

Growth strategy

A strategy based on the growth objective focusses on an allocation of investible and human resources to industrial subsectors, activities and projects which would together yield the highest rates of returns. This means, in the present context, a strong orientation to major export markets. This strategy requires:

- High efficiency, hence:
 - thorough commercial cost/benefit analyses;
 - the latest management methods;
 - radical modernization/upgrading of equipment;
 - full exposure to internal/external competition;
- Foreign direct investment;
- A very active marketing strategy;
- Large imports of intermediates, components, equipment;
- Acquisition of foreign know-how;
- An up-to-date support infrastructure (physical and services).

Employment would need to be reduced in overstuffed plants and far-reaching autonomy of companies would be a major prerequisite for reaching rapid growth. The locational pattern of industrial establishments would probably accentuate prevailing regional disparities as locations would be preferred which have an efficient infrastructure.

Basic needs strategy

An industrial strategy for meeting the basic needs of the population would direct resources towards the production and domestic supply of

- basic food items;
- standard clothing;
- construction materials for housing; and
- basic medicines and other products for the health system.

Some of the major characteristics or preconditions for implementing this type of strategy would be:

- Heavy emphasis on agro-industry;
- Priority in allocation of investible resources to the relevant product groups and their backward linkages (agriculture, fishery, building materials, etc.);
- Pre-investment studies with emphasis on efficient production and distribution systems for the basic needs products;
- Pricing and wage policies which allow high demand by the masses of the population;
- Foreign trade policies primarily directed to supporting domestic production for domestic needs;
- A significant role for small-scale industry.

Resource-based strategy

This strategy would aim at optimum exploitation of domestic natural resources in the agricultural, fishery, forestry and mining sectors and at processing of these resources for both domestic and foreign markets.

Major characteristics of the pursuance of this strategy would be:

- Accelerated exploration and exploitation of mineral deposits, including natural gas and petroleum;
- Emphasis on promoting cash crop production, including fruit and vegetable plantations;
- Detailed fishery surveys and systematic build-up of catching and fish farming capacities;
- Forestry surveys, introduction of sound forestry management systems and systematic reforestation with appropriate species;
- Priority allocation of investible resources to domestic processing of natural resources;
- Intensified international co-operation for acquisition of modern, large-scale equipment, know-how and financial resources as well as international marketing of processed commodities;
- Export orientation of the resource-based industries;
- Increasing level of energy demand and continued build-up of energy generation;
- Modest growth of employment and small-scale industry;

- Specialized high-skill requirements for the various processing industries;
- R&D directed to modern technological processes;
- A number of larger capital investment projects especially in the mineral-based industry (capital-intensive processes, large economies of scale, and long gestation periods);
- Special attention to the criteria of ecological sustainability in the preparation of both the strategy and the individual projects.

Employment strategy

A strategy focussing on maximum productive employment would de-emphasize efficiency and international co-operation and would concentrate on labour-intensive production processes. Some of the particular features are:

- Small-scale industries would play a major role;
- Pre-investment studies would use low-shadow prices for labour costs;
- Low degree of international co-operation except for the purpose of establishing export enclaves with foreign companies;
- Selected export-oriented activities with labour-intensive production and assembly processes with imported components and new materials (in-bond), such as electronics assembly and garment production;
- Industry would primarily use low technology or appropriate technology, except for export-oriented assembly plants;
- Rural industries would be developed;
- Decentralized decision-making, banking and distribution would be called for.

2. Need for a strategy mix

The above illustration of alternative strategy options is useful to differentiate and clarify different priorities and their implications. However, there is obviously no one single goal to be pursued. In practice, an industrial strategy is necessarily a mix of various goals, policy considerations and allocation patterns. Many choices cannot even be made once-for-all but need to be assessed in an iterative and/or disaggregated way. There is also no absolute solution but rather a space of manoeuvring, for instance in the following categories of choices:

- Market-orientation (import-substitution vs. export promotion, selection of main export target markets);
- Government role (market-oriented industrial development vs. direct government intervention; private vs. public ownership);

- Technology choice (efficient, modern or large-scale technology; as a special case: the role of high technology);
- Industry scale (large-scale industry vs. medium- and small-scale industry);
- Product lines (light vs. heavy industry; basic needs goods vs. goods for urban higher income groups; subsector priorities and linkages);
- Integration (national - with other economic sectors - vs. international integration of industrial production; regional integration);
- Factor intensity (labour vs. capital intensity in production; related to this: resource-based industrialization).

As a basis for determining the choices and the strategy mix, the structure of the economy, the economic system, the international trends and driving forces and available resource and constraints must be diagnosed and assessed.

In the case of Viet Nam, the general framework for a strategy is determined by its socialist system, with strong public ownership and government planning, and by:

- The aim to pursue a rapid industrial transformation;
- The endeavours to enlarge the scope, form and direction of international industrial co-operation, including the attraction of foreign direct investment, and foreign trade with non-traditional product groups in new markets;
- The endeavours to increase efficiency of industrial enterprises by decentralizing decision-making and giving them more autonomy.

A diagnosis of the overall economic and industrial weaknesses of the country shows:

- A complex government administrative machinery which is too rigid to enable substantive, quick responses;
- Very low efficiency and level of technology in industry;
- An industrial system with few incentives for efficiency increases and dynamism, and organizational weaknesses;
- An inefficient system of pricing and foreign exchange allocation;
- Acute foreign exchange scarcity and large external debt servicing obligations;
- Regional imbalances in terms of productive capacities and growth capabilities;
- A growing population pressure;

- A relatively isolated position in the international economic system.

These weaknesses can be contrasted with the following overall economic strengths:

- Ample human resources and availability of highly competent, skillful and hardworking industrial workers;
- Extensive natural resources, especially minerals and fish;
- Growing energy supply and untapped further sources;
- Large and growing domestic market;
- Location in the world's most dynamic region;
- Basic research and development resources in advanced technological fields;
- Ambitious policy-makers, strongly favouring new ways of industrial development and international co-operation.

The methodology proposed

The approaches suggested for the formulation of an industrial strategy can be outlined as follows:

- A set of detailed diagnoses of industrial subsectors in terms of their strengths/ weaknesses/opportunities/ threats within the international production system;
- A "filière" approach to identify interlinked chains of development in selected key branches of industry;
- A direct involvement of all concerned actors in the diagnosis and formulation of work;
- A reduction of possible inconsistencies between current short-term plans and the strategy;
- A systematic, parallel build-up of a strategic and analytical statistical data base.

As a time horizon for the industrial strategy a 15-year perspective is proposed. Three phases of gradual change and decreasing accuracy of definition of measures can be distinguished:

- 1990-1995 - with focus on rehabilitation of existing capacities;
- 1995-2000 - with focus on the build-up of integrated production and institutional support networks;
- 2000-2005 - with focus on major expansions through new ventures.

To create a sufficient initial information base for assessing the constraints of and prospects for Viet Nam's future industrial development, in-depth analyses would need to be undertaken covering, *inter alia*, recent trends and structural changes in key branches of manufacturing; patterns of trade in manufactures; size and regional distribution of enterprises by subsector; inter-industry linkages and availability of supporting industries; degree of import dependence; capacity utilization; technological level and modernization needs; ownership patterns and management practices; etc.

These branch-level analyses would need to be complemented by an analysis and assessment of the resource base for industry in a longer-term perspective, including special attention to the issues of resource depletion and, where possible, resource renewal. Furthermore, the entire environment for manufacturing activities would need to be reviewed, including financial issues, institutional support and the physical infrastructure.

3. Selection of priority "filières"

On the basis of analyses of prevailing production structures and policies and assessments of prospective developments and constraints, a first attempt is generally made to translate overall objectives into industrial priority activities. In the case of Viet Nam, the "filière" approach could be applied, utilizing specific production chains of interdependent activities which cut across a number of industrial subsectors and other sectors, such as industrial services, to build up mutually supporting interlinked growth structures.

The main reason for applying the "filière" approach in the case of Viet Nam is that the current production system and the industrial network are very poorly developed and hardly integrated. A spontaneous development of complementary activities cannot be expected.

The application of the "filière" approach for industrial strategy formulation presupposes a decision on how many and which specific "filières" have to be selected for a meaningful analysis and strategy. In the case of Viet Nam, priority "filières" selected would - apart from textiles¹ - also have to cover the agro-industry field. This would include the production of industrial inputs for agricultural production (fertilizers, pesticides), agricultural machinery and processing equipment and a range of industrial services.

Following an initial selection of "filières" to be considered for the strategy, detailed data collection and analysis would be carried out on the requirements for the development of a filière, from raw materials to industrial services and distribution. The requirements are then to be contrasted with analyses of possibilities or opportunities of Viet Nam in terms of specific advantages for developing such production activities.

After this, the benefits of "filière"-specific development could then be assessed in terms of its relative contribution to the general socio-economic objectives of Viet Nam, and alternative scenarios should be drawn up.

¹ For a specific assessment of this key subsector see UNIDO, "The Textile and Clothing Industry in Viet Nam - A Filière Approach", 20 July 1990 (mimeo).

In the characterization of the "filières" the time dimension needs to be taken into account. Some problems can be solved, and some disadvantages may be overcome only in the long run, and some advantages may disappear. It should be attempted to make relatively precise assessments of the time factor. The capacities for managing and monitoring "filières", and the current and potential development facilities in the complementary activities, will also need to be considered.

The exercise can also be split into two parts, one consisting of studying the ways and means and deciding what are considered to be the optimal modalities for developing the "filière", the other consisting of defining alternative scenarios in terms of quantitative and performance targets for different time horizons.

To arrive at the most likely scenario these different scenarios are evaluated in terms of macro-economic constraints which are likely to prevail at different points of time during the 15-year period of the strategy. Also the macro-economic consistency has to be checked, starting with the most ambitious scenario. If inconsistencies do appear - e.g. the required resources of a kind are clearly larger than those which are likely to be available - more modest scenarios have to be chosen, until scenarios remain that seem to be feasible under the constraints foreseen. In due course, these constraints will turn out to be more or less stringent, in which case the implementation of the strategy will have to be adapted.

The operational content of the strategy has in any case to be adapted continuously to changing conditions and circumstances. It will thus be possible, to introduce more ambitious scenarios for the development of the priority "filières" or to enlarge the number of "filières" as time passes. This will be essential when elaborating the part of the of the "filière" which has to be realized in the medium term, i.e. within the framework of the next five-year plan.

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78. Mr. Bui Phuoc Duc
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Planning Committee
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79. Mr. Vu Quang Hoi
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94. Mr. Hoang Thuy Loan
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96. Mr. Pham Trung Tuyen
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97. Mr. Vu Duy Thai
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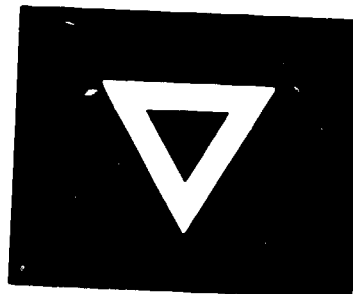
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LIST OF VIETNAMESE SEMINAR STATEMENTS

- Prof. Tran Phuong - Opening speech. "Toward a dynamic, effective industry in order to satisfy the requirements of national development in the new stage".
- Mr. Le Quoc Khanh - Some remarks on the paper "Viet Nam's industrial development".
- Mr. Nguyen Phi Hung - A comment on the document "An assessment of Viet Nam's industrial development".
- "Policy renewal and industrial development over the past two years".
- Mr. Nguyen Xuan Thu - Some remarks on the paper "Development and diversification of rural industrial activities in developing countries: Lessons for Viet Nam".
- Mr. Nguyen Duc Minh - Some ideas on the document "The economic and industrial structure of Viet Nam".
- Mr. Pham Quang Tam - Comments on the paper "The textile and clothing industry in Viet Nam: A filière approach".
- Mr. Tran Ngoc Trang - Remarks and findings by SPC.
- Dr. Nguyen Chi Vu - Some contributions to the paper prepared by UNIDO experts on Viet Nam's industrial development.
- Mr. Nguyen Van Thu - Some remarks on the part: "Science and technology at the service of industrial development".
- Mr. Pham Nhat Vung - Some remarks made by the General Office of Statistics.
- Dr. Nguyen Van Dang - Some remarks on the report made by the UNIDO experts' team.
- Eng. Vu Duy Thai - More assistance should be given to small- and medium-size industries, a favourable environment should be created to attract scattered sources of capital from the population to investment in production.
- Mr. Dang Phong - Speech delivered at the UNIDO Seminar on the industry.

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