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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

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21663

DP/ID/SER.A/1770/Rev.1
11 December 1996
ORIGINAL: ENGLISH

ASSISTANCE TO THE TUMEN RIVER ECONOMIC DEVELOPMENT AREA GOVERNMENTS IN PRIORITIZING INDUSTRIAL INVESTMENT OPPORTUNITIES

SI/RAS/95/801

Technical report: Findings and recommendations

VOLUME I

Prepared for the Governments of China, the Democratic People's Republic of Korea and the Russian Federation by the United Nations Industrial Development Organization, acting as executing agency for the United Nations Development Programme

Based on the work of J. Ayoub, Y. J. Chen, W. B. Miller, M. Nagano and S. Pigon, team leader

Programme Manager: M. Subroto
Investment Technology and Promotion Division

United Nations Industrial Development Organization
Vienna

V.96-88198T

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INTRODUCTION

This report embodies the results of work of the following consultants in the Tumen River Economic Development Area (TREDA) from August to November 1995: J. Ayoub, Y. J. Chen, W. B. Miller, M. Nagano and S. Pigon (team leader). They were supported in their work by national consultants: L. Lebedeva (Russian Federation), C. Wang (China) and Li Myong-gun, Kim Song-gyo and Li Un-jong (Democratic People's Republic of Korea). Their individual reports were integrated into this final version by the team leader under the coordination of the Programme Manager: M. Subroto, Investment Technology and Promotion Division, UNIDO.

The technical assistance was implemented by the United Nations Industrial Development Organization (UNIDO) at the request of the Governments of China, the Democratic People's Republic of Korea and the Russian Federation and financed by the United Nations Development Programme (UNDP). It focuses on industrial subsectors in manufacturing that had been selected for further studies and analysis. Like previous reports conducted for TREDA, this report aimed at the in-depth study of selected industrial sectors and did not address any macroeconomic or structural issues.

Strategically located in terms of global trading patterns, the Tumen River area possesses enormous potential for industrial development, which could be realized by cooperation among the countries in the region. Situated where China, the Democratic People's Republic of Korea and the Russian Federation meet, it has easy access to the adjacent parts of those countries as well as to Mongolia, with its abundant natural resources. The nearby Chinese provinces of Jilin and Heilongjiang form large potential markets. Moreover, the Tumen River area has the advantage of proximity to the markets of Japan and the Republic of Korea and to the large capital resources, advanced technology and managerial know-how available from those two countries. It also has access to Europe via a transcontinental railway.

The economic complementarity of these countries makes the area an ideal location for a world class transit/transport hub and processing/manufacturing centre, under cooperative management by the countries of the region. Such complementarity can also provide a basis for economic development in an even broader region through cooperative efforts, which encourage trade and investment beneficial for all the countries. Regional maritime trade will be greatly facilitated, since China will have a shorter distance over which to transport its exports to Japan, and the Russian and Chinese trade with the Republic of Korea could be accomplished more directly. Development in the area will help the Democratic People's Republic of Korea to expand its economy and its participation in world markets, and Mongolia will have easier access to the nearest ports for export purposes.

The UNDP-sponsored Tumen River Area Development Programme (TRADP) launched in 1991 primarily involved the joint formation by the Governments of China, Democratic People's Republic of Korea and the Russian Federation of a long-term, comprehensive plan for economic cooperation. TRADP initially focused on a series of studies on infrastructure, environment, legal matters and institutional management, most of which were inventories or of an exploratory nature. In 1993 UNDP asked UNIDO to prepare a profile of the industrial sector in TREDA, with a view to taking stock of the state of industry under TSS-1 funding. TRADP activities in recent years have included the promotion of industrial development and assistance in preparing pre-investment studies. UNIDO is involved in preparing specific industrial manufacturing studies to help assist TREDA authorities prioritize their industrial opportunities and implement investment promotion programmes for Yanbian Prefecture in the Tumen River area of China and the Rajin-Sonbong Free Economic and Trade Zone (hereinafter called the Rajin-Sonbong Zone or, simply, the Zone (in the Democratic People's Republic of Korea).

The main goal of this report (SI/RAS/95/801) is to analyse selected industrial subsectors and to formulate practical recommendations to assist the central and local government officials who are

responsible for TREDA in their decision-making and to improve their industrial investment strategies, priorities and incentives.

The report covers a number of light industry sectors: food processing and beverages, fish/seafood processing, textiles/garments, light engineering and plastic/household appliances, light building materials, household decorations, electronics, toys and stationery. Later, at the request of the authorities, two industrial subsectors were added: the traditional medicines sector in China and the Democratic People's Republic of Korea and the shipbuilding sector, including the conversion of factories that once produced only military vessels in the Russian Federation.

The in-depth analysis describes the current status of the sectors and their key enterprises, the extent of government support and investment plans, and assesses their potential markets as well as the business environment and its attractiveness for foreign investors. Its results may be helpful to the authorities of TREDA in formulating their short- and long-term industrial development and investment promotion planning, policies and regulations.

Owing to major differences in the level of industrial developments in the three countries, the scope and approach of the consultants' work and the structure of the report itself were adjusted to suit local circumstances and requirements. Accordingly, the report does not present developments in the three countries in the same manner, although, each country's description follows the same analytical framework to arrive at specific conclusions and recommendations. In particular, the current situation in industrial enterprises in the Zone requires careful explication. Most of these enterprises have not so far been analysed in such a detailed way. Since, by contrast, the industrial sector in China has already been presented in detail in earlier UNDP and UNIDO reports, this report focuses on the industrial programmes and priorities recently elaborated by the Chinese authorities. The analysis of industrial development in the Primorskiy Territory required surveying existing companies and studying the array of vast statistics prepared by central planning authorities.

All parts of the report have been extensively documented with statistical data, reports of site visits and evaluation sheets. A strengths-weaknesses-opportunities-threats (SWOT) analysis was conducted for a number of enterprises and sectors. Questionnaires and a summary of results are included as annexes.

Volume I presents the main findings, conclusions and recommendations of the study and contains ten annexes.

It examines the current situation in the light industry sectors in each country, taking stock of the existing production facilities and capacities and assessing the potential for and constraints on development. The issues involved in development are profiled in a separate chapter which allows in-depth analysis of selected sectors and the highlight of the outlook in the future. It goes on to recommend a number of actions for consideration by policy makers at the local and central Government levels. Some of the recommendations for specific sectors are detailed and tentative action plans are set out in various annexes.

Annexes I-X of volume I contain additional explanatory material collected by the consultants in the field as well as a selection of the most important qualitative background information. The traditional medicine sector and shipbuilding in particular are gone over in detail.

Volume II, *Enterprise Survey and Statistical Data,* has been published separately (DP/ID/SER.A/1776/Add.1). In the course of the assignment, the consultants spent a lot of time verifying and re-verifying data to assure their reliability, particularly when the information sources had to be

translated. Thus, volume II is a valuable source of information, for potential investors among others. Brief company profiles as well as other useful data are included. This is particularly the case for the Rajin-Sonbong zone in the Democratic People's Republic of Korea and the Primorskiy Kray in the Russian Federation, for which very limited information was available prior to the mission.

CONCLUSIONS

There is a vast potential for industrial development in all the countries concerned. A number of processing industries can be based on rich natural resources, relatively low labour costs and an excellent location. However, new products and services should be researched and introduced to meet growing market demand at home and abroad.

There are many areas in which the three countries should develop joint strategy for industrial growth based on specialization. Such specialization should be implemented by means of intergovernmental agreements and United Nations-sponsored measures as well as direct business agreements. Studies and activities that identify unnecessary competition should be supported.

There is an urgent need to upgrade and restructure industrial enterprises in the region, including their production, management and marketing systems. Permanent training schemes to assist companies and businesses of different sizes should be established. The internal organization and structures of existing factories and manufacturing plants need to be thoroughly reconsidered. The allocation of equipment and personnel, plant layout and essential operations need to reassessed.

Numerous project proposals and development concepts have been already identified. Active promotion measures should be adopted to attract more foreign investors to the region.

In the face of the inadequate financial support system in the region, the development of banks and financial institutions is of pressing importance. State financial support is necessary during the period of transition and change in the market system.

While there has been substantial progress in solving transportation problems in the region, most infrastructure issues have not yet been solved. Feasibility studies and financing schemes for different infrastructure projects must be initiated immediately. National, regional and local authorities should take an active part in developing the infrastructure in the region.

I. LIGHT INDUSTRY IN THE RAJIN-SONBONG DEVELOPMENT ZONE

A. Industrial stocktaking

In the Rajin-Sonbong Zone 19 of the 56 existing light industries were selected by the Government of the Democratic People's Republic of Korea to be covered (table 1).*

Table 1. Light industries selected for study

Industry	*Rajin*	*Sonbong*
Garments and textiles	Rajin Weaving Factory Rajin Knitwear Factory Rajin Clothing Export Factory	Sonbong Textile Factory Sonbong Tannery and Leather Processing Factory Sonbong Garment Factory
Daily necessities	Rajin Plasticware Factory Kwangok Ironware Cooperative Rajin Export Ironware Factory Rajin Chemical Daily Necessities	Sonbong Daily Necessities Factory
Foodstuffs	Rajin Disabled Soldiers' Factory for Foodstuff Processing Rajin Bean Paste Factory Rajin Meat and Fish Processing Factory	Sonbong Foodstuff Processing Factory Sonbong Sodium Carbonate Factory
Wood products	Rajin Paper Mill Rajin Furniture Production Cooperative	Tumangang Sleeper Sawmill

The overall industrial picture for the Zone is as presented in table 2.

Table 2. Number of factories in the Zone

Industrial group	*Number of factories*	*Rajin area*	*Sonbong area*
Machinery[a]	10	6	4
Chemical	8	4	4
Building materials	9	4	5
Garment and textiles	7	4	3
Foodstuffs	7	4	3
Daily necessities	11	4	7
Total	52	26	26

Source: Commission for the Promotion of External Economic Cooperation, August 1995.
[a]Includes ship repair, small-scale spare parts and agricultural machinery.

*Two fish/seafood catching/processing enterprises and two building materials enterprises were added by the consultant. The information for the building materials enterprises is incomplete and the consultant did not visit these enterprises. The main criteria for the selection were the availability and quality of buildings, the possibility for expansion and the quality of the existing equipment.

Ten of the 56 light industry enterprises are planned and administered by the central Government, and of these ten, seven are small and medium-sized enterprises (SMEs). The Sungri Chemical Complex is by far the largest, having contributed significantly to the chemical industry's 70 million won (US$ 32 million) share of a total gross national product (GNP) of 100 million won (US$ 45 million) in 1991 in the Zone. The remaining 46 enterprises are controlled, administered and operated locally and are geared to local consumption. According to government officials, the enterprises selected are a good representation of the situation throughout the Rajin-Sonbong Zone: there are 29 enterprises in the three industrial groups (garments and textiles, foodstuffs and "daily necessities"), and the 16 selected and analysed closely reflect the remaining 13 enterprises.*

To achieve self-sufficiency, the Zone, which has a population of approximately 139,000 (63,000 in Rajin and 26,000 in Sonbong) has followed the policy that local enterprises should maximize the use of local resources. Each city is responsible for providing its own basic requirements, and the local factories' products are consumed primarily by local consumers living near the factories.**

Exceptionally, some factories orient their production to meet domestic or export demand. The Rajin Export Garment Factory, the Rajin Export Ironware Factory and the Rajin Wood Processing Factory*** are export-oriented factories, although at present only the Rajin Export Ironware Factory exports its products (to Africa). The other two processed raw materials imported from the former Union of Soviet Socialist Republics are not currently available. (See the individual enterprise account, in annex, for detailed information.)

Industrial output in 1991 is shown in table 3.

Table 3. Production of major industry groups in the Zone, 1991

Industrial group	*Design capacity*	*Actual production*	*Proportion of full capacity (percentage)*
Processing of crude oil (tonnes)	2 000 000	800 000	40
Shipbuilding (number of ships)	86	30	35
Ship repairing (number of ships >10,000 tons)	270/42	160/16	38
Condensers (pieces)	2 400 000	480 000	20
Wood processing (m^3)	170 000	110 000	65
Cement (tonnes)	10 000	8 000	80
Bricks (pieces)	1 000 000	30 000	3
Paper (tonnes)	1 100	200	18
Soda ash (tonnes)	2 000	50	3
Caustic soda (tonnes)	30	22	73
Textiles (m)	900 00	130 000	14
Knitwear (pieces)	370 000	55 000	15

*According to government officials, some enterprises in other groups are in a better overall situation than those in the light industries.

**For this reason, according to the local authorities, the industry and the quality of products in the region is not representative of industry in the Democratic People's Republic of Korea.

***This was a branch of a factory outside the Zone and has now been closed.

Industrial group	*Design capacity*	*Actual production*	*Proportion of full capacity (percentage)*
Garments (pieces)	3 350 000	2 530 000	76
Bean paste (tonnes)	2 500	2 270	91
Soy sauce (l)	2 100 000	1 470 000	70
Candy (tonnes)	1 060	80	8
Cake (tonnes)	1 080	130	12
Grain processing (tonnes)	65 000	47 000	72
Soap (tonnes)	1 600	220	14

Source: Committee for the Promotion of External Economic Cooperation, August 1995.

Output since 1991 has decreased in most of industrial groups because of the lack of raw materials, although some groups such as bean paste and soy sauce have remained relatively stable. (See the individual enterprise account, later, for detailed information.)

B. The present system

1. Product allocation and marketing

The present marketing system in the Rajin-Sonbong Zone demands that a factory produce goods according to the available raw materials and national requirements to meet local needs. Based on past requirements and population, future requirements are decided by local authorities. The central Government determines which raw materials are to be made available to enterprises and in what quantities. When local production is not enough to meet local needs, the central Government provides assistance. When surpluses are produced by local factories, these are made available to meet national requirements. From time to time, when demand justifies or a lack of raw material so necessitates, enterprises may produce products other than those specified by the Government. Designs and styles are decided at the central level, e.g. leather shoe designs come from the Shoe Institute of the Academy of Light Industry.

The present system of product and materials allocation is generally as follows:* the State Planning Commission, which is responsible for strategic planning, policy and production and the relevant ministries (coal and transport for example) are at the centre of the Government. At the provincial level are the provincial planning Committees, which have departments in charge of industrial production. At the city and county level administrative and economic committees have departments responsible for industrial operation. Since the Democratic People's Republic of Korea is a centrally planned economy, all factories and enterprises must adhere to the policy set by the central authorities.

The State Planning Commission drafts production plans for the country's most important products. Provincial planning committees prepare plans for products that are important at that level. More specifically, the system works like this:

- Periodically, the State Planning Commission sets out target figures for individual products, i.e. the amounts required.

*The explanation was given to the consultant by a Rajin-Sonbong city official.

- The State advises the provinces of those amounts and tentatively allocates an amount to each province and industry.

- The provinces and industries review the amounts and comment on them.

For example, steel mills run by the central authorities produce most of the steel in the Democratic People's Republic of Korea, so most of the target amounts will be assigned to those mills. Cigarette lighters and locks/keys, by contrast, can be made by either central industry or provincial industries. An allocation is made to central industry and to each province. If, for example, a province has been assigned 10,000 lighters and 5,000 locks/keys, the provincial authorities in turn allocate the lighters and locks/keys to cities and counties according to the equipment and materials available. If, say, Rajin city is allocated 5,000 lighters, the city authorities assign the production to a factory or factories. If, for instance, the Kwangok Ironware Cooperative is assigned 5,000 lighters and 5,000 locks/keys, this is a notification only, not a directive to produce. The director of the factory confers with the employees to discuss the amount and the way to produce the products, given the cooperative's equipment, supply of materials and human resources. The discussions must be oriented to finding all possible solutions to implement the assigned figures. The director and the employees may conclude the factory could produce more lighters, say 6,000 instead of 5,000, and fewer locks/keys, say 4,000 instead of 5,000. The city government is informed of this conclusion. It then reallocates the amounts to factories within its jurisdiction. If other firms cannot produce the additional assigned locks/keys, the provincial planning committee is informed. At the provincial level, all information is collated and adjustments are made. The State Planning Commission is then informed by the provincial authorities.

The State Planning Commission then puts together all the information, makes the required adjustments and issues the final and binding* figure to central industry and the provinces. The economic and administrative committees in each county or city will allocate the products and monthly quotas to enterprises according to monthly plans. Again, the factory director is legally responsible for producing the allocated amounts but may vary the monthly outputs as long as the annual total is achieved. Each factory keeps two types of plans:

- A product plan for each product.

- A turnover plan, which reveals if the factory is making the prescribed amount of money.** If the director finds the factory cannot fulfil the product plan, he or she can modify the product figures to meet the turnover figure required.

At the time the production agreement is signed, other agreements are also signed to support the production plan, e.g. material supply, labour, equipment, costs and profits agreements. The economic and administrative committees oversee departments that support the plans, such as the materials and supply department, the transport fleet department, the technical and engineering departments and training schools. In the above example, the industry department will direct the relevant department to arrange transport and will direct the technical and engineering department to provide designs etc. and, if necessary, organize training classes.

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*The figure is legally binding on the State and on factory management. If the factory fails to produce the binding amounts, not for reasons beyond its control, management salaries will be reduced in proportion to the failure and managers could be removed from their positions. The State is legally bound to purchase the allocated amounts.

**This does not mean the factory must make a profit. Because all enterprises are under one central area, some enterprises will make profits and some will not.

2. Industrial management

In this way, the economic and administrative committees manage local industry (under their control and responsible for industry) that does not fall directly under central industry. Factory managers must know how to produce, improve quality, cut costs, incorporate new technologies etc. for the prescribed products, given the materials and equipment available. Furthermore, they must do this with the welfare of the employees in mind.

At present, the authorities in the Rajin-Sonbong city have the same authority as the economic and administrative committees but in addition are empowered to approve, without consulting the provincial or central levels, joint ventures not exceeding US$ 10 million (infrastructure) or US$ 5 million (other sectors, including light industry). Local joint ventures will no longer be bound by the system described above, although non-joint venture factories in the Zone will be, even though the output is consumed or in other parts of the Democratic People's Republic of Korea locally, or in other parts of the Democratic People's Republic of Korea. Authorities may give advice to the joint venture firm, e.g. about standards, amounts, but the advice will not be legally binding. The Zone authorities will help the joint venture by, for instance, providing workers and buildings and by appointing young, competent managers for the joint venture firms. The Zone authorities will visit the companies to assist where they can (with labour, for example),* but the joint venture cannot benefit from other facilities provided to non-joint venture firms by the Rajin-Sonbong economic and administrative committees.

3. Distribution and pricing

In general terms, the distribution system involves a local distribution centre that collects the finished product(s) from the factory. The centre makes the product(s) available (sells them) to the local shops that sell to the local consumers. All allocated volumes produced by the factories are guaranteed to be bought by the local distribution centre if the products meet the established standards. The factory can be fined for failing to produce to standard. Likewise, if the centre fails to buy all the products meeting the standards, it may have to compensate the factory.

Prices are set according to established margins from the factory through to the consumer. That is, the factory adds a margin on top of its costs, the distribution centre adds another margin and the shop selling the product, another. Included in the costs is a payment to the Government for the use of the factory (in proportion to the output, of which a portion is for the direct use of the factory). Some necessities are subsidized for consumers by adding higher margins on luxury items such as jewellery and tobacco goods. Pricing is determined at the central government level. In the future, if, and only if, a local enterprise enters into a joint venture, it is envisaged that the system will work through negotiated prices; that is, it will respond to demand and supply mechanisms in the market. For example, if a joint venture produces more than can be exported, the surplus may be sold to the local trading company at a negotiated price. Shops will purchase the product from the trading company at a negotiated price and will set their margin on the product according to what the market will pay. Thus, market pricing will be the norm.

Quality is maintained by the factory management. In some cases, such as in the foodstuffs group, government inspectors are also involved on a day-to-day basis. When products are exported, government export inspectors are employed to ensure quality.

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*The only experience to date is with a one-month old soap joint venture, where according to authorities, the manager has already been trained and is acceptable to the joint venture partner.

4. Human resources

The educational level of the human resources in the Rajin-Sonbong Zone is very high, as it is throughout the Democratic People's Republic of Korea. Each worker has completed a minimum of 11 years of free compulsory education. Technicians have done additional free training at a technical college, while engineers have graduated from university. Management staff usually have university degrees. Other workers may have participated in a one-year training programme at one of the training centres (e.g. Rajin-Sonbong Training Centre) or in an apprenticeship scheme. There are eight levels of skilled workers, ranging from "general", levels 1-4 (e.g. clerical); "skilled", levels 5-6; "highly skilled", levels 7-8. Furthermore, workers in the Democratic People's Republic of Korea are not only well educated and trained but are known to be diligent, honest, dedicated and unselfish. Women who are not working in the factories do not remain idle. For example, the wives of men working in a knitting factory form their own knitting groups and hand knit at home.

The average monthly minimum rates of pay (25 days/month) are as follows:

Level	*Wage/salary (won)*
Management	200
Technicians	220
Skilled (7-8)	210
Skilled (5-6)	180
Skilled (1-4	160

The national Government is responsible for a 15-day holiday each year, medical care and medicine, education, housing and bonuses.

*5. Individual enterprise account**

The consultants assigned to the Zone carried out an in-depth analysis of the prioritized enterprises, identifying the basic problems and developing tentative recommendations and action plans for the sectors. This was accomplished by visits to the enterprises (and discussions with management), to ports and to infrastructure developments and lengthy, open and frank, meetings with the Commission for the Promotion of External Economic Cooperation (CPEEC) representative and local Zone authorities, where written data was checked and checked again until all parties were satisfied with its reliability. Although the selected sectors were light industries, building materials (excluding timber) and fish/seafood processing, officials of the Democratic People's Republic of Korea did not prioritize enterprises in the building materials and fish/seafood sectors. However, information was collected but not with the same depth as with the initially prioritized enterprises. Details on individual enterprises in the Zone are presented in volume II.

C. The traditional medicine sector in Rajin-Sonbong

1. Existing production capacity and market orientation

The pharmaceutical industry, both modern and traditional, plays a more important role than any other industry in the Zone. Over 100 kinds of medicines are produced in this area, including injections,

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**Source:* CPEEC, Rajin and Sonbong officials and national consultants.

tablets, pills, tea bags, powders and medicinal wines. The total value of the production (sale) of the Sonbong Pharmaceutical Factory and the Rajin Pharmaceutical Factory reached 2.25 million won in 1994, which accounted for 2 per cent of total output value of all industries in the area. The financial performance in this sector is good with a profit margin of about 30 per cent. Traditional Korean medicines account for about 50 per cent of the total sales of medicines produced in the two pharmaceutical factories. All of the exported medicines are traditional, for example, Korean ginseng products, diosgenin and starfish products

The production of medicines in the Rajin-Sonbong Zone has grown steadily in the 1990s, as shown in table 4. Although the growth rate is slow, pharmaceutical production is relatively in good shape compared to other industries, some of which decreased their output in the 1990s.

Table 4. Growth of pharmaceutical production

Year	*Output value (won)*
1990	2 000 000
1991	2 060 000
1992	2 080 000
1993	2 100 000
1994	2 250 000
1995 (first half)	1 200 000

The central Government and local authorities have been encouraging the traditional Korean medicine industry. The development and modernization of the Sonbong Pharmaceutical Factory, one of two pharmaceutical factories in the Rajin-Sonbong area (both are described in detail in volume II), is considered as a priority by the authorities of the Zone. Of the 25 enterprises at the top of the priority list, it occupies the tenth position. In April 1995, Moscow Pantochrin Company, Russian Federation, sent a delegation to the Zone to discuss a possible joint venture pharmaceutical company.

2. The sector's development concepts and future plans

The sector's development concept includes a further expansion and modernization of the traditional Korean medicine industry, biopharmaceutical industry to make full use of the rich supply of medicinal plants, marine animals and ginseng; the full exploitation of potential markets; and the full use of existing production capacities by establishment of joint-venture companies with foreign investors. The plans will be implemented in two stages.

(a) First stage (by 2000)

In the dioscorea industry, the scale of production will be expanded to 20 tonnes diosgenin, more advanced technology (enzyme method) will be introduced and production equipment and quality control instrumentation will be modernized. A joint venture company is to be established to implement this plan. In the Korean red ginseng industry: the cultivation base for ginseng will be improved, the processing technology and production equipment of red ginseng will be modernized and advanced instruments for quality control, such as HPLC will be introduced along with new ginseng products, such as ginseng tea capsules and tablets. In the biopharmaceutical industry a joint venture company will be set up with the Moscow Pantochrin Company or other potential investors and existing production conditions will be

modernized. The marine medicine industry envisages the expansion and modernization of existing workshops.

(b) Second stage (2000-2010)

The dioscorea industry will continue to produce diosgenin in large quantities for export, to establish a new hormone medicine industrial base using diosgenin as the raw material from which to produce hydrocortisone, prednisone and prednisolone. In the Korean red ginseng industry, workshops for the production of ginseng products will be improved to meet GMP requirements and export a higher quality of ginseng products. The biopharmaceutical industry expects to modernize all its capacities to meet GMP requirements and export more. In the marine medicine industry new products, such as a blood substitute from starfish (for domestic markets), will be developed. Other subsectors of the traditional Korean medicine industry will be modernized to serve domestic health care. Future development plans will concentrate on the following traditional pharmaceuticals:

- Diosgenin, which is extracted from *Dioscorea nipponica*, is exported to the Netherlands and Germany. The potential market is China and Japan. The competitive advantage is that although diosgenin is required in large quantities (ca. 880 tonnes/yr) by big pharmaceutical companies in the world, it is distributed only in the Democratic People's Republic of Korea, China and the eastern Russian Federation. Thus, it would be a great advantage for the Zone to expand its production of diosgenin to meet the large international demand.

- The main markets for Korean red ginseng are Hong Kong, South-east Asia and China. The main competitor in international markets is the Republic of Korea.*

- The leading marine medicine is *sambali*, which is extracted from starfish. This medicine is oriented to the Inner Mongolia and China markets.

- Biopharmaceuticals such as cytochrome C are produced for the local market. The main competitor is the biopharmaceutical factory at the Pyongyang Meat Processing Company, which is the first biggest biopharmaceutical factory in the country.

3. Human resources and the technological base

Although human resources are abundant, there are several weaknesses to be overcome:

- The lack of international marketing personnel.

- The lack of highly qualified personnel who have international advanced high technology education and can operate modern equipment and instruments.

- The lack of highly qualified managers to run modern pharmaceutical enterprises according to GMP standards.

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*The ginseng products of the Republic of Korea are well packed, and their quality is well controlled. But the quality of ginseng grown there is not as good as that of ginseng grown in the Democratic People's Republic of Korea because ginseng prefers a cool climate. If more attention is paid to quality control and packaging by introducing advanced analytical instruments and packing materials and machines, the ginseng products of the Democratic People's Republic of Korea compete better in international markets.

Training and upgrading of the personnel is therefore a prerequisite for the Zone necessary to develop a competitive industry.

As mentioned above, the existing technological base consists of two factories: the Sonbong Pharmaceutical Factory and the Rajin Pharmaceutical Factory (see volume II for details). The Sonbong Pharmaceutical Factory has the technologies and experience to produce about 60 kinds of medicines. However, since these technologies and the equipment are more than 30 years old, it will be vital to introduce advanced technologies and modern equipment by establishment of a joint venture or some other kind of international cooperation.

4. Current limitations and scope for improvement

It is obvious from the industrial stocktaking document (see volume II) that the lack of a steady, controlled flow of crucial materials to the enterprises analysed has extensively disrupted production:* 37 per cent of the enterprises report such problems. Unfortunately, the most severely affected enterprises within the subsector are the ones most likely to be export-oriented, i.e. the garment and textile enterprises. Of the 35 main materials used by the six factories analysed in the garments/textiles subsector, 24 (69 per cent) were found to be not sufficiently available to maintain production levels. Furthermore, if coal (available in abundance from Onsong, just outside the Zone, and under the control of Rajin-Sonbong city) is excluded from the list of materials, nearly 100 per cent of the materials would fall under the category of "insufficient".

The next most affected sector is the "Daily necessities" group (plastics, ironware and soaps), with 9 of the 31materials used (29 per cent) not sufficiently available. If the Rajin Export Ironware Factory is excluded, the amount is 43 per cent (by the nature of its products, all the 10 major materials it uses are sufficiently available). The four enterprises in the foodstuffs group follow, reporting 20 per cent of their materials as insufficient. The three wood products factories report 17 per cent. The two organizations dealing with the harvesting (catching) and processing (preparing the catch for live and frozen shipments) of fish and seafood have no problems with the amount of fish and seafood available, other than that some are seasonal. However, such areas as ice-making need to be addressed.

Some other factors are as follows:

- Since the region operates under a centrally controlled system, most enterprises rely on materials from one supplier.
- The local market in Rajin-Sonbong city is small, because the population totals only about 139,000. However, surplus products can be sold to other parts of the country.
- Factories duplicate products. As an example, all four foodstuffs enterprises analysed produce vodka and two produce candies and cakes.
- The design capacities of nearly all the enterprises analysed exceed their outputs, some by large amounts.
- Most enterprises analysed produce for local consumers, and their quality, by international standards, would be considered not competitive.

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*Sometimes the problem is that a factory has an abundance of some materials but a lack of others. For example, a knitwear factory could have enough yarn but no needles.

- Most factory buildings appear to be structurally sound and the equipment well maintained.

- Without exception, the machinery is old, most of it having been made in the 1970s,* and labour-intensive; some is manually operated.

- The staff appear to be well trained and highly skilled. Factory management, after consultations with local authorities and with the cooperation and advice of skilled staff, implement collaborative decisions.

- While seeking joint ventures, local authorities are moving to solve the raw material and equipment problems with, for example, local projects to obtain foreign exchange with which to purchase foreign materials are under way. This includes collecting mushrooms, producing handicraft items and farming mink to sell abroad.

- Little is known about the Rajin-Sonbong Zone outside TREDA, although over 100 foreign delegations have come through the Zone this year.

- At the time of this report, there is considerable activity in the Zone (see annex for a detailed list). Owing to the heavy workload, however, no improvements are immediately evident.

From discussions with the CPEEC and local authorities, the plan for the Zone is that joint venture enterprises will operate under a market system, while non-joint-venture enterprises will continue to operate under the central planning system. In effect, this means a dual economy will operate within the Zone. Such a scheme could adversely affect the region's working population: for example, working conditions, equipment and renumerations in the joint ventures may be better than those in the non-joint ventures, causing unwanted friction. Furthermore, non-joint-venture firms may find that they are unable to obtain materials for which joint venture firms are negotiating. As an example, suppose a joint venture is producing acorn-flavoured vodka for export and is therefore competing with non-joint-venture firms in the region for rice and acorns (via the purchasing authority). It is likely that the joint venture firm will be able to offer higher prices for the materials, reducing the amount and probably the quality, of rice and acorns available to non-joint venture firms. A similar scenario could be foreseen for vegetables, fish/seafood, building materials etc.

*The machinery may have been made in the 1970s or 1980s but appears to be modelled on earlier versions, perhaps USSR versions of the 1950s.

II. LIGHT INDUSTRY IN YANBIAN PREFECTURE

A. Development trends

At the beginning of the 1990s the role of light industry in the industrial structure of Yanbian Prefecture became more important (tables 5 and 6). Its share in total output had reached almost 55 per cent by 1994. The light industries sector enterprises accounted for 53.17 per cent of all industrial enterprises in the region. This trend has been determined by two factors:

- Economic reforms and opening up of the region.
- Development of the Hunchun Border Economic and Cooperation Zone (referred to hereinafter as the Hunchun Zone or, simply, the Zone).

Table 5. Yanbian light industry enterprises and their output

Indicator	*1980*	*1990*	*1991*	*1992*	*1993*	*1994*
Light industry	53 801	198 308	316 886	349 267	373 870	432 978
Heavy industry	51 452	157 904	265 284	294 643	344 857	354 787
Output (thousands of Y[a])	105 253	356 212	582 170	643 910	718 727	787 765
Light industry	573	904	894	876	826	923
Heavy industry	422	729	729	738	747	813
Total number of enterprises	995	1 633	1 623	1 614	1 573	1 736

[a]Y = yuan renminbi.

Table 6. Structural changes of Yanbian industry in the 1990s
(Percentage)

Indicator	*1980*	*1990*	*1991*	*1992*	*1993*	*1994*
Light industry	51.12	55.67	54.43	54.24	52.02	54.96
Heavy industry	48.88	44.33	45.57	45.76	47.98	45.04
Output	100	100	100	100	100	100
Light industry	57.59	55.36	55.08	54.28	52.51	53.17
Heavy industry	42.41	44.64	44.92	45.72	47.49	46.83
Total number of enterprises	100	100	100	100	100	100

The general outline of the industrial structure does not reveal all problems facing the development of light industry in Yanbian Prefecture. A more detailed analysis of statistical data does, however, allow identifying them. Table 7 presents basic statistical data on the various light industry sectors.

Light industry grew faster than GNP. However the relative importance of light industry's contribution to GNP has not changed much. Also, the ambitious plans of the Hunchun Zone has not so far considerably changed the share of the light industry sector of Yanbian Prefecture in Jilin Province light industry output. The increase in the total number of light industry enterprises was impressive, but

this quantitative change has not been accompanied by a qualitative change, as can be seen from the fact that 227 light industry enterprises (e.g. 24.6 per cent of all enterprises in this sector) are in a deficit situation. The data in table 7 show the scope of the economic and financial problems faced by the sector in Yanbian.

Table 7. Basic statistical data for Yanbian light industry

Indicator	*1990*	*1991*	*1992*	*1993*	*1994*
Output value of light industry ('000 Y)	1 983 080		3 492 670	3 738 700	4 329 780
Growth rate of GNP (%)		2.6	8	10.5	12.7
Growth rate of light industry (%)		3	10.2	7	15.8
Proportion of light industry in GNP (%)	46.6	44.2	44.7	45.1	45.9
Proportion of Yanbian light industry in Jilin province (%)	12.71	12.4	12.36	12.03	12.10
Number of light industry enterprises	904	894	876	826	923
Number of light industry enterprises in deficit		208	194	198	227
Number of food processing enterprises		--	--	63	64
Number of food processing enterprises in deficit		--	--	21	13
Number of food manufacturing enterprises		98	101	59	67
Number of food manufacturing enterprises in deficit		30	34	19	22
Number of beverage enterprises		73	73	73	81
Number of beverage enterprises in deficit		30	24	20	33
Number of textile enterprises		32	30	37	43
Number of textile enterprises in deficit		18	17	15	16
Total benefit of light industry ('000 Y)		23 740	4 610	264 641	-13 270
Total benefit of food processing industry ('000 Y)		--	--	16 626	-2 070
Total benefit of food manufacturing industry ('000 Y)		7 740	3 940	1 262	-6 050
Total benefit of beverage industry ('000 Y)		2 600	1 060	21 254	-5 410
Total benefit of textile industry ('000 Y)		-12 170	-6 120	17 100	2 080

Source: *Statistical Yearbook of Yanbian Prefecture, 1991, 1992, 1993 and 1994.*

B. Strategic position of the sector

A survey of 100 large enterprises in the light industry sector in Yanbian Prefecture (see volume II of report for details) reveals the financial and economic weaknesses of the sector. The most important observation is that there is not a specific subsector that generates deficits. In every branch there are both profit- and loss-making enterprises.

The structure of Yanbian light industry is dominated by textile and garment, foodstuff and beverages, and daily use products (electric and chemical). A significant share is taken by the traditional medicine sector which is analysed later in this chapter.

The geographical distribution of light industry in Yanbian shows that the Hunchun Zone has not yet become the centre for Yanbian manufacturing. Enterprises located in Yanji, 30.23 per cent of all enterprises in the prefecture, account for 39.1 per cent of the total industrial output, while those located in the Hunchun Zone have contributed only a tenth as much (table 9). Thus, Yanji remains the hub for the development of light industry in the region.

Another important feature of the light industry structure in Yanbian Prefecture is that the products are raw-material-intensive rather than processing-intensive. More than 85 per cent of Yanbian light industry is based on agricultural raw materials compared to 69.1 per cent in all of China. The share of highly processed and technologically advanced goods with high value added is still relatively low. As a result, light industry production in Yanbian is not competitive, even in the domestic market.

This report concentrates on selected industrial branches and briefly discusses development-related issues. The detailed characteristics of the major enterprises in the specific branch is presented in volume II of the report.

The Yanbian industrial structure is still dominated by agro-based and raw material/minerals-based industries: food and tobacco processing, textile and garment manufacturing, pulp and paper processing and traditional medicines. In recent years, household chemicals and electrical appliances have started to be manufactured. This diversification does not meet growing local demand nor is it sufficient to stimulate further development of the region or the better utilization of its resources.

Table 8. Composition of Yanbian light industry, 1994

Branch	*Sector*	*Number of enterprises*	*Output value ('0000 constant 1990 Y)*
Textile	Cotton	12	14 138
	Wool	3	3 826
	Hemp	2	4 608
	Knitting	25	9 105
	Chemical fibres	5	33 140
Paper and printing	Paper making	26	41 116
	Printing	66	10 239
	Pulp	-	
Garment	Garments and shoes	56	10 465
Non-metal product	Cement and cement products	48	13 034
	Glass and ceramic	14	14 880
	Isolation and construction materials	128	7 864
Electrical and electronics	Electrical equipment	5	3 745
	Lighting appliances and daily use equipment	11	927
	Devices	6	262

Branch	*Sector*	*Number of enterprises*	*Output value ('0000 constant 1990 Y)*
	Telecommunication equipment and electronic components	9	602
Foodstuffs	Food processing	64	16 903
	Food manufacturing	67	5 207
	Beverages	81	19 679
Chemicals	Rubber	9	1 800
	Chemical household products	15	4 042
Tobacco		3	69 211
Metal products	Metal household products	20	1 388
	Metal construction materials	27	2 923
Plastic products		15	12 719
Stationery		27	2 088

Table 9. Geographical distribution of Yanbian light industry

County	*Number of enterprises*	*Share of total (%)*	*Output value ('0000 constant 1990 Y)*	*Share of total (%)*
Yanji	279	30.23	137 115	39.10
Longjin	113	12.24	59 580	16.99
Dunhua	103	11.16	48 012	13.69
Hunchun	63	6.83	13 987	3.99
Tumen	82	8.88	51 510	14.69
Helong	101	10.94	11 243	3.21
Wangqing	114	12.35	15 667	4.47
Antu	68	7.37	13 561	3.87
Total	923	100	350 675	100

This chapter analyses the overall SWOT situation of selected industrial branches based on site visits and studies by the experts in the field as well as on numerous discussions with the authorities and managers.

An industrial survey of major industrial enterprises and the growth of output in the sector is presented in volume II. The relative importance of specific manufacturing branches is shown in table 10.

Table 10. Share of output value accounted for by different branches in Yanbian Prefecture
(Percentage)

Branch	*1992*	*1993*	*1995*	*1996*	*1998*	*2000*
Food processing	5.3	5.4	5.6	5.6	6.2	6.7
Beverage	3.1	3.3	3.7	3.9	5.0	6.3
Tobacco	12.1	13.3	16.1	17.6	19.8	21.8

Branch	*1992*	*1993*	*1995*	*1996*	*1998*	*2000*
Textiles	3.2	2.8	2.2	1.9	1.6	1.4
Sewing and leather	2.4	2.5	2.7	2.8	3.5	4.3
Furniture	0.5	0.5	0.4	0.4	0.4	0.4
Paper making	6.6	6.3	5.7	5.4	5.3	5.1
Printing and stationery	1.9	1.9	1.8	1.8	2.1	2.4
Medical industry	7.0	7.3	7.8	8.0	8.6	9.0
Rubber and plastic	2.7	2.4	2.0	1.8	1.4	1.1
Electronic devices	0.9	1.8	1.5	1.3	1.2	1.2
Coal industry	1.9	1.9	2.0	2.1	2.0	2.0
Metal and non-metal industry	1.4	1.4	1.2	1.1	1.0	1.0
Wood industry	8.7	8.1	7.0	6.5	5.3	4.2
Timber and artificial board particle	5.7	5.2	4.4	3.9	2.9	2.1
Electricity	3.9	3.8	3.5	3.4	3.1	2.7
Petrochemicals industry	5.8	5.7	5.0	4.7	3.8	3.1
Synthetic fibres	4.0	4.0	3.8	3.7	3.3	2.6
Building materials	7.7	8.8	10.7	11.6	12.4	12.9
Metallurgy industry	1.1	1.0	0.9	0.9	0.8	0.8
Metal product processing	2.7	2.5	2.1	1.9	1.6	1.4
Machinery manufacturing	6.3	6.0	5.5	5.2	4.3	3.6
Transportation equipment manufacturing	1.6	1.7	2.0	2.1	2.3	2.4
Equipment repair	2.6	2.5	2.3	2.2	2.0	1.8
Total	100	100	100	100	100	100

C. Dominant industrial sectors

1. Food and tobacco processing

Rapid growth in the food and tobacco processing in the 1990s was attributed to the increased availability of raw materials. Yanbian is a major producer of agriculture crops, including beans, grains, tobacco and fruit. Local forest and wild plant resources are available in abundance, especially in the Changbai area. The strong raw material basis supports a number of large food and tobacco processing companies in all parts of the Prefecture, with a significant concentration around Yanji. Alcohol and beverages production, including beer and wines, has a considerable share of the total output. This production has recently been strengthened by soft drinks production and mineral water bottling.

There is no dispute as to the importance of the region as a domestic and regional supplier of staple products and semi-processed food products, and its unutilized potential remains to be further developed. The value added to the exported raw material is still too low, and the technological level of processing, preserving and packaging is not competitive. A very important characteristic of this subsector is the domination of tobacco processing, the output of which amounts to 62.9 per cent of total output.

Two major factors are determining the development of this subsector: (a) the availability of abundant local raw materials and (b) the proximity of markets. The dynamic development of the Tumen River area will create additional demand for high-quality food products. Cross-border markets in the Russian Federation and the Democratic People's Republic of Korea are becoming more accessible as new transport connections are established. A new stimulus for food processing in the region is a growing demand for health food products. Enormous resources of wild plants, herbs and animals are still

processed in a very traditional way and consequently sold or exported in semi-processed form. Similarly, the growing demand for instant food products is also stimulating development in this subsector.

The main obstacle to development is the lack of capital for modernization and rehabilitation as well as for the introduction of new technologies. The lack of managerial skills also adversely affects the development of this branch. The plant-site visits and the SWOT analysis for the branch show that the lack of modern managerial skills and technological innovation are the weaknesses of most enterprises. In most of the food processing enterprises storage facilities are inadequate, which makes production cycles highly seasonal and sometimes leads to major losses of resources or/and decreases the quality of the products. Sometimes this is accompanied by the lack of sufficient funds to purchase raw materials including inventories.

2. Textiles and garments

The textile and garment industry developed rapidly in the 1980s but slowed down in the beginning of the 1990s, showing slower growth than the rest of the light industry. The textile branch is yarn-oriented, with garment manufacturing lagging behind. Flax and synthetic (viscose) yarn production is the most advanced. Yanbian has very favourable conditions for flax cultivation and also has abundant wood resources. The production capacities, created in the 1980s, are large (Yanji Flax Complex and Kaishantun Chemical Fibre). Attempts to introduce natural silk and wool processing have not been successful owing to technological and quality problems. Yanji garment factories have not reached the quality level of factories in the other parts of China; however the recent garment project in the Hunchun Zone and other parts of Yanbian are very promising.

The low-cost labour and the potential advantages of the Tumen River area development are the most important advantages, apart from raw material availability. The recent boom on the flax textile market is enhancing growth in this branch.

The upgrading of quality and the introduction of new technologies are most immediately needed. This calls for a large injection of capital, similarly to that needed by other light industry sectors. Although some investment in textile machines equipment was made in the 1980s, the equipment is obsolete now. It is estimated that only 10 per cent of the machinery and equipment meets modern international standards. Yanji textiles will also benefit from product innovation and better horizontal integration of industries. The development of garment manufacturing will add value to the products of this branch, which is having more success in exporting yarn and textiles than garments and knitted products. Another obstacle to be overcome is the lack of qualified human resources, especially those with technical and managerial skills. The number of technicians and engineers employed in this sector is less than average for Jilin Province and China.

3. Paper and pulp production

Ample forestry resources have created a natural base for pulp and paper production as well as for the manufacture of different kinds of paper products. Two large scale enterprises dominate the branch-sector: Shiyan Paper Mill and KaiShanTun Chemical Fibre Pulp Plant. Existing production capacities supply a wide variety of products, from newsprint and offset print paper to different packaging products.

The basis for further development of the paper industry in Yanbian is quite solid. Full utilization of existing natural resources, combined with measures for the protection of the environment, will secure steady growth.

The industry suffered some decline at the end of the 1980s, but growing domestic demand for packaging products, mainly caused by the development of the Hunchun Zone and other export-oriented industries will cause the industry to grow. The paper and pulp industry will continue to be one of the pillars of industrial development in Yanbian.

4. Construction and building materials (except wood products)

The construction and building materials base in Yanbian is vast. Deposits of 58 different kinds of non-metallic minerals have been found to be suitable for mining and extraction. Yanbian is endowed with a variety of mineral resources: diatomaceous earth for the chemical industry, raw materials for glass production, ceramic title and elements as well as limestone, granite, marble and other stones used in construction. The Prefecture faces a strong competition in the market since other Chinese provinces possessing similar raw materials have already managed to set up processing facilities.

The development programme for the Tumen River area, including its transport network, has created new opportunities for the development of this subsector.

Apart from non-metallic products Yanbian Prefecture also possesses a good basis for the production of plastic and aluminium building construction materials. This branch is growing rapidly as a consequence of growing demand from the new companies established in the region.

D. Current limitations and scope for improvement

The survey of selected industrial sectors in Yanbian Prefecture reveals several common problems that need to be addressed to enhance the industrial development process:

- Low value added production dominates in most of the sectors. Mostly they manufacture and export semi-finished products.

- The technological level of production is relatively obsolete. There is an urgent need to upgrade existing technologies and to introduce new, competitive ones.

- In many industries, the lack of managerial and technical skills creates an obstacle to innovation and technological progress. As a result, abundant natural resources are not properly exploited and the share of high quality products is not satisfactory (especially, middle- and high-grade products).

- There is a lack of financial resources for restructuring unprofitable (the deficit) companies.

- The export orientation of industries still has not reached the level needed to achieve economies of scale.

In restructuring the industry and determining a strategy for its development, a number of comparative advantages can, however, be recognized:

- Very favourable location, especially in the context of closer cooperation between the three bordering countries to improve transport facilities.

- Abundant agricultural and mineral resources.

- An existing industrial base suitable for restructuring and modernization.

- All these advantages, together with policies and strategies recently implemented by the authorities with support from the provincial and central government levels, can greatly accelerate the development of light industry. The strategies elaborated by local authorities seem to be working as intended, i.e. they are strengthening the processing and manufacturing of basic industrial sectors.

- Reform-oriented industrial policies to development in the region (the establishment of a development and export processing zone).

- Growing market demand in both domestic and foreign markets.

E. Strategic plans and options

Two elements of the strategy should be emphasized:

- Further support and development of the Hunchun Border Economic and Cooperation Zone, to capitalize on the special economic status and export processing capacities.

- Balanced development in the whole Prefecture to make the best use of abundant natural resources and human resources.

After the initial spurt of growth that accompanied the start-up of the Hunchun Zone, the last few years have seen some slowdown in industrial development. One reason is that the transportation network leading to the Russian Federation and the Democratic People's Republic of Korea was not created as scheduled. The other is the overoptimistic assumption that the Hunchun Zone would rapidly adopt advanced technology. There is also a need to shift the zone development's concept from state development and trade facilities construction into wider introduction of processing industries. The long-term goal, which is to introduce the newest technologies, should be linked in the short and medium term with the enhancement of different type processing, which will create a critical industrial base.

The share of light industry in the Hunchun Zone is still lower than in other parts of the Prefecture (47.8 per cent of total industrial output in 1994). The start-up phase of the light industry enterprises revealed marketing weaknesses, which only some of the companies, like the Sino-Korean joint venture for knitted garments, have been able to overcome. The development plans for light industry in the Hunchun Zone envisage the introduction of a number of new products such as high-quality household appliances, packaging materials, synthetic textiles and canned food.

The expansion of the Hunchun Zone should not in any way hamper the development of the other regions. The plan presented by Prefecture authorities, which focuses on developing all of the region along the railway axis running from the border through the entire Prefecture, seems to be a good one. Since to concentrate all resources on the Hunchun Zone would increase the risk of economic failure should the development of transport systems and complementary industries across the border be further delayed, the plan emphasizes promoting the industrialization of five other centres within the Prefecture: Antu, Dunhua, Chunchun, Tumen and Yanji.

There are signs that the authorities have fully understood the importance of balancing growth in the entire Prefecture rather that concentrating solely on the Zone. The light industries development strategy elaborated in 1995 (goals: Y 4 billion output value, 60 key enterprises, 30 new products and 200 million investment) calls for balanced development, with optimal use of natural resources, effective manufacturing and marketing systems and export orientation.

F. Traditional medicine sector

1. Existing production capacity and market orientation

Yanbian Korean Autonomous Prefecture has a strong traditional Chinese pharmaceutical sector. There are 23 pharmaceutical enterprises in Yanbian, 13 of which produce traditional Chinese medicines. More than 700 kinds of traditional medicines are made in form of injections, tablets, oral liquids, tea bags, capsules, granules, pills etc. The total production value in 1994 was Y 423 million, which accounted for 6 per cent of the total output value of all industries in the Prefecture. Traditional Chinese medicine contributed 80 per cent of the total output value of pharmaceutical products. The production supplied both the local market, including other provinces of China, and the export market, e.g. Japan, Republic of Korea, the Russian Federation, Hong Kong and Singapore. Some products, such as *xueshuan-xinmaining* (an anti-thrombus drug), have very strong domestic market demand. The output value of that particular drug reached Y 108 million in 1994.

The traditional Chinese medicine industry in Yanbian Prefecture has been growing very fast in the 1990s. The output value in 1994 was 2.1 times that in 1990, with an average growth rate of 23 per cent a year. The profit in 1994 was Y 66 million, which was 3.1 times that in 1990. The average annual increase of profits was 32.5 per cent. It can be said that traditional Chinese medicine industries make an important contribution to the health care of the local population as well as the population in other parts of China and abroad.

Although the traditional Chinese medicine industry in Yanbian has developed good production systems, most of the enterprises have inadequate R and D capacities and lack advanced equipment and modern analytical instruments. Consequently, they are not able to manufacture high-quality, competitive products.

The 13 enterprises for the production of traditional Chinese medicines in Yanbian Prefecture manufacture 23 dosage forms. The production capacities of the main dosage forms and their market orientation are listed in table 11.

Table 11. Production capacities and market orientation of the traditional medicine sector, 1994

Dosage form	*Unit*	*Annual production capacity*	*Actual output*	*Market orientation*
Oral liquids	Bottle	500 million	263 million	Domestic and local
Injections	Ampoule	70 million	14 million	Local and domestic
Tablets	Tablet	1 300 billion	245 billion	Domestic and local
Granules	Tonne	750	270	Domestic and local
Capsules	Capsule	1 billion	570 million	Domestic and local
Pills	Tonne	250	75	Domestic and local

Most traditional Chinese medicines produced by Yanbian enterprises are exported to other provinces of China, especially to the southern provinces such as Canton, Fuzen and Zhejang. Some products have very strong domestic demand. Only a small percentage is exported, to the Republic of Korea, Japan, the Russian Federation, Singapore, Hong Kong and Taiwan Province of China.

The key enterprises making traditional Chinese medicine are Dunhua Pharmaceutical Factory (DPF), Hunchun Pharmaceutical Company (HPC), Yanji Second Pharmaceutical Factory (YSonbong Pharmaceutical Factory), Antu Pharmaceutical Factory (ATPF), Aodong Pharmaceutical Company (APC) and Huakan Pharmaceutical Factory (HKPF). Brief descriptions of those enterprises and their priority projects are given in volume II.

2. Sector development concepts and future plans

There is a vast potential for Yanbian to further develop its traditional Chinese medicines industry. The Prefecture has two important competitive advantages:

- *Rich natural resources of medicinal plants.* Botanical investigations have indicated that 1,412 species of medicinal plants grow in the Changbai mountain area, including such important plant-drugs as dioscorea, ginseng, astragalus and schizandra. So far, only 14 per cent of the natural resources are utilized for industrial production. For example, there is a large enough supply of dioscorea for further development of the dioscorea industry, and more than 800 ha of land are suitable for cultivating ginseng.

- *Robust domestic and foreign markets.* Fifteen traditional Chinese medicines and natural products, such as *aotaile*, *xueshuang-xinmaining*, anshenbunoye and diosgenin have robust markets in the southern parts of China, and demand for some of them remains unsatisfied. Most of these traditional Chinese medicines have especially good therapeutic effects in difficult diseases, such as *aotaile* for anti-hepatitis, *xueshuang-xinmaining* for embolisms, *xingnodan* for brain thrombus. There is potentially a good demand for them in international markets, as the treatment of such difficult diseases with chemicals often fails.

3. Human resources and the technological base

There are 7,130 staff working in the pharmaceutical enterprises, including 570 well-educated and highly qualified personnel. Yanbian Prefecture has the human resource base to conduct advanced R and D on new drugs and to produce and control the quality of traditional Chinese medicine.* The weak area in human resources is the lack of international marketing personnel and GMP management personnel.

All of the traditional Chinese medicine enterprises are situated near railways or roads linked to the major parts of China and are connected to the Russian Federation and the Democratic People's Republic of Korea. Yanji airport has regular flights to the large cities of China. DPF, HKPF, YSonbong Pharmaceutical Factory, HPF, ATPF and YPF have large factory campuses that can be further expanded. DPF and APC have rehabilitated their factories' infrastructures, and they possess a great deal of space for production.

DPF and APC also have the most advanced equipment–for example, computer-controlled extractors and fully automatic production lines–for the production of oral liquids and granules. The two enterprises have reached, or nearly so, GMP standard. Although the equipment of the other traditional Chinese medicine enterprises is more than 25 years old, they have integrated, rich technologies and experience for the production of 700 kinds of medicine, and they all have the appropriate instruments for analysing the quality of those medicines.

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*Yanbian University, the Yanbian Medical College, the Yanbian Agriculture University and the Shenyang Pharmaceutical University can provide the traditional Chinese medicine industry in Yanbian with appropriately educated personnel.

4. Development concepts and priority enterprises

The Yanbian Pharmaceutical Administration's concepts for developing the traditional Chinese medicine industry include the following:

- The establishment of technologically advanced industries to produce medicaments and special traditional Chinese medicines for the treatment of difficult diseases, making full use of the natural resources in the Changbai mountain area.
- Modernization of equipment.
- Strengthening of R and D capability for new traditional Chinese medicine.
- Improved quality control for traditional Chinese medicines.
- The development of high quality, technologically advanced high technical content, high value added new products and special patented products.
- The development of tonics and health foods.

The development goal is to reach a production value of Y 1 billion by the year 2000. All enterprises should achieve GMP standards at that time. The main signs of modernization are the ability to attract capital, including running joint-venture companies, corporations and companies, a larger manufacturing scale, improved quality and R and D capability for new traditional Chinese medicine.

The following recommendation based on factory visits, may be formulated for the traditional Chinese medicine sector in Yanbian. The enterprises with the greatest potential are DPF, YSonbong Pharmaceutical Factory, HPC and ATPF. All four have projects with big market potential, good human resources, integrated technologies and equipment and instruments for production and quality control. They also have a strong market position in China. Most of the raw materials required are from the Changbai mountain area, which is rich in natural resources. Of the 23 projects selected by Yanbian Prefecture authorities, four could be selected as priority projects at the present stage: *guyang* granules (anti-cancer, immunostimulant drug), traditional Chinese medicines for apoplexy, the dioscorea industry and the ginseng industry.

III. LIGHT INDUSTRY IN PRIMORSKIY KRAY

A. Overview

Tables 12 and 13 present figures for three main industrial subsectors in Primorskiy Kray.

Table 12. Global autonomous enterprises, 1993

	Combustibles and energy industry	*Forestry and pulp industry*	*Fishing industry*
Value of output (million R)	154 594	80 668	469 434
Number of enterprises	18	35	10
Total human resources	31 868	18 886	42 979
Of which, workers	24 988	16 187	30 384
Capitals production[a] (million R)	60 088	12 395	264 705
Return on capital (%)	3.10	8.70	3.30
Equipment value (million R)	1 563	482	3 336
Return on investment (% change from year N-1)	36.10	2.07	(0.38)
Profit (million R)	(39 210)	17 908	78 585
Profitability (%)	(17.65)	32.46	31.04

[a]December 1993.

Table 13. Distribution of the total workforce in the other industrial subsectors
(Percentage)

Industrial sectors (1995)	*Production output*	*Workforce*
Food processing, including seafood processing and fisheries	51.50	31.40
Machinery and tools	13.20	16.30
Coal, mining	4.30	13.10
Forestry and lumbering	5.60	10.20
Building materials	5.40	7.50
Mechanical works	4.80	6.00
Chemical industry	2.70	4.50
Meal and grits processing	3.70	3.40
Light industries	1.00	3.30
Energy	7.20	2.20
Porcelain and faience	0.20	1.00
Macrobiological industries	0.60	0.40
Printing and stationery	0.20	0.30
Heavy metallurgy	0.12	0.13
Medical industries	0.10	0.30
Total	100.00	100.00

B. Textile industry

1. Overview

A number of shortages have characterized the clothing sector in Primorskiy Kray during the transition to a free market economy:

- The existing structures lack technical, commercial and product definition skills, and they need new technologies and methodologies. The abolition of all central and regional government subsidies has forced private businesses to operate independently for profit.

- Most companies are in financial deficit, and the lack of funds has forced them to borrow at a very high interest rate (180-200 per cent for six months). At such rates, no medium- or long-term investments can be proposed by local bankers.

- Large segments of the clothing market, including the military uniforms market have been drastically reduced as these uses decline in the Primorskiy region. The market for schools uniforms has also declined owing to legislation changes.

- The general decrease in purchasing power has reduced the market penetration of all products.

- As the existing inappropriate commercial networks are dismantled, they are being replaced by a new kind of network that uses very aggressive door-to-door sales techniques.

- The liberalization policy has increased the volume of all imported goods. This rapid growth of imported products reduces profit margins and market penetration of national products in local markets. The imported goods, which are more fashionable, adversely affect the local products. The situation was in a continuous decline and reached a critical level in 1995.

2. Industrial stocktaking

In Primorskiy Kray, the textile and clothing sector has a low strategic volume that accounts for about 1 per cent of the GNP: production output for the first 9 months of 1995 was 34 billion Roubles (R). In 1995, only 3 per cent of the industrial workforce (7,167 persons in 1994) were involved in the whole light industries sector (clothing, leather and shoes, fur processing). In 1990, there were 18,743 persons; in 1991, 16,644; and in 1993, 9,402.

Official regional statistics for underwear, clothing and raw material shows that imports in this subsector amounted to US$ 39 million in 1993 and US$ 19 million in 1992. This increase of 211 per cent in one year was a result of the reduction of the local production output. The estimated global market in the sector at that time was US$ 150 million.

The imports of raw materials in this sector was US$ 2.9 million in 1992 and US$ 1.3 million in 1993, caused by the same reduction of local production.

The information obtained from company managers during interviews can be summarized as follows:

- The reduction of production in the sector from production in 1985 was 111.90 per cent in 1990, 50.70 per cent in 1993 and about 35 per cent (estimate) in 1994.

- The reduction of productivity in the light industry sector from production in 1985 was 131.8 per cent in 1990 and 62.4 per cent in 1993.

- The increase of prices in constant Roubles 1994/1993: 180 per cent for clothes and 256 per cent for raw materials.

- A large volume of goods remained unsold owing to the increase in their sales price and the loss of purchasing power.

- The financial difficulties of enterprises and the amount of their debts increased owing to unpaid customer invoices for delivered goods, longer credit terms, the increase of financial costs/fees due to short-term loans etc.

- All moderately and highly skilled and experienced workers have left local enterprises without any replacement, which might lead to problems 3-5 years from now.

The existing garment enterprises in eastern part of the Russian Federation were designed for monopolistic markets protected by national legislation, where the supply in every case was lower than the demand.* Development in this sector in the Primorskiy Kray is presented in volume II of the report.

3. Existing production capacities and market orientation

All privatized enterprises (six major factories in 1995) in the garment sector were established on a joint-stock basis (100 per cent owned by the State). They follow the previous system's business strategies, and production plants were spread over several large towns in Primorskiy Kray (Vladivostok, Spaask, Ussuriysk and Partizansk), with small production units in Slavyanka. The facilities were designed in the 1970s to produce large output using unskilled and moderately skilled manual labour with a minimum of automation.

The existing facilities are not suitable for current market definitions. The only way to survival is to re-engineer and downsize the facilities, taking into consideration the flow of goods, the internal management of raw materials and the rationalization of the production process. The reorganization and modernization of institutional framework might recoup the 15 per cent loss in productivity.

It is recommended that all the production lines and their related facilities should be downsized and upgraded.

4. Current limitations and scope for improvement

Technology and equipment

The lack of appropriate investments in the last 20 years means the equipment is not up to international standards. The technology used is mostly 15 years old (1980s) and out of date for industrial needs. Modern designing tools (computerized systems), and cutting tools are practically nonexistent in the sector and the system of raw material management has never been optimized. A very low level of

*The rapid switch from a centrally planned economy to a market economy caused problems for this sector. The economic crisis (inflation rate 15,204 per cent in 1994, 800 per cent in 1993 and 1,353 per cent in 1992) discouraged any new initiatives, and the output, sales and purchasing power dropped drastically. The highly and moderately skilled personnel resigned from the companies or were fired, and many of them even left the sector.

automation equipment should be re-evaluated gradually, taking into consideration the need to upgrade along with intensive training of the existing workforce.

There is a shortage of spare parts for equipment and tools manufactured in the former USSR, and many of equipment suppliers have ceased their production or disappeared. The equipment acquired in 1989 (standard cutting machines, standard sewing machines) is totally unsuitable for large-scale industry.

New investments are indispensable to introduce a new generation of products based on new technology. Consultations and negotiations with major international suppliers to this sector should be conducted to re-evaluate the existing equipment.

Management and administrative duties

There is also an urgent need to introduce new methods of management, reporting, financial control, on-line stock management etc. in existing companies. Plant managers should be trained internationally to acquaint them with the competitive production methods in the garment sector.

Despite the drastic reduction of personnel in these enterprises, the number of unproductive technical people (not workers) is still too high: 28 per cent excess for Zaria and 16 per cent for Zodiaq. Reformulating their job description could reduce the workforce by at least 25 per cent, without technology management (computers). They should be trained and switched into commercial marketing activities.*

The job of commercial staff in existing enterprises was simply to follow up and manage orders. There was no open-market economy and no business structures such as a marketing/sales force or a purchasing department. Currently the commercial people sell the output and collect the payments. They do not interact with the marketing department (if one exists) or the production department.

The rigidity of commercial conditions (payment, credit terms etc.) deters many retailers from doing business with existing production enterprises, some of which demand cash payment for the delivery of goods. Many retail shops are unable to settle their invoices and had their accounts closed owing to outstanding invoices. A barter system has been introduced that permits such enterprises to be paid directly in goods.

Commercial activities in the garment sector have specific characteristics, even at the local scale. These characteristics play a crucial role in export activity: the lack of aggressive efforts to capture new markets is a structural weakness. A special training programme for commercial staff and networks should be prepared by international specialists.

5. Potential for the future

Marketing, product mix and diversification

The sector seems to have a lower priority in the mind of governmental bodies than the other major sectors, seafood and food industry, whose 65 000 employees account for 31.4 per cent of the industrial workforce and 51.5 per cent of GNP.

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*Formerly, management was not given any financial objectives. There were no aggressive commercial structures, no strategies and no marketing departments to improve products or to increase market share. Technical specifications and designs came from the central authorities in Moscow. No initiatives were taken by local management.

The volume of production output is planned on the market needs. Except for RITM at Nakhodka, no new business proposals have been presented.*

Half of the output of the garment industry is distributed to Primorskiy Kray and the remainder to Khabarovsk, Sakhalin, Kamchatka, other parts of Siberia and as far west as the Urals. The products and production capabilities are given in volume II of the report.

The kinds of products are decided exclusively by the management and designers of each enterprise. The factories do not compete with one another. Before 1993 there was no dual market, as mentioned in the previous chapter. All the garments produced are basic, everyday clothing. A change of mentality on the part of management in the newly privatized companies is required to match product types to social and economic realities.

Product types are not attuned to demand. There have been no licence agreements that would allow producing garments with internationally recognized trademarks to satisfy the wishes of customers in Primorskiy Kray. All production is on long integrated cycles and require the management of complete stock and components. This means an immobilization of huge amount in circulating funds and a concentration with a big risk of unsold products.

Many existing enterprises have some experience in short-cycle products earmarked for export, especially Palp brand men's shirts and Molodojnaya brand men's, children's and women's shirts). In 1994, 80 per cent of production was exported compared to no exports in 1990. The aim is to increase the export rate to 100 per cent, based on short-cycle products. This experience was the first to make use of subcontracting. There were many start-up problems including the lack of an international level of quality and delays on delivery times. The lessons learned will help with new products and to start the licensing system for the next product.** The main aim is to earn some hard currency to allow management to revamp existing facilities and to introduce new technologies for each new contract. The optimal solution would be for each project to at least partly pay for itself. The second aim is to allow the workforce in this part of the Russian Federation to put its skills to use in the international market. The third aim is to eventually recapture the local market now largely served by the so-called shuttle trade market.

Prices and taxes

With all subsidies stopped, enterprises now calculate their sale prices based on their real costs, taking into consideration the facility's productivity level, the availability of equipment and balance equilibrium. Sales prices of products manufactured for the local market are defined by the price level of the similar imported goods, without any elasticity. Retail profit margins for Primorskiy products are lower than similar goods imported by the shuttle trade market. All of the factories have had difficulties in bringing their prices down to international levels owing to the high taxes in Primorskiy.***

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*In 1994 and 1995, RITM proposed the total renovation of the existing facilities at a cost of US$ 400 million in order to increase the output of gloves to 4 million pairs per year. (The gloves are of the kind worn by fishermen.) This proposal was prepared in connection with efforts to attract foreign investors, who need to see, at a minimum, some basic information and accurate figures.

**All designs, raw materials, haberdashery and packaging materials will be supplied by the purchaser. The value added by Primorskiy Kray industry has been very limited, so this will set production on the path to free market competition. These subcontracting arrangements are carried out with very small profit margins. Productivity gains, e.g. if orders double, would increase these margins.

***Owing to the rigorous accounting system only official companies are obliged to pay these federal and regional taxes on their incomes, profits and production, even if it has not been sold. The parallel underground

(continued...)

Production of some items (mostly knitwear) has already been stopped because it is uneconomical.

Business services and investment climate

There is no investment climate in the light industries sector at present. No local investors are ready to take risks and to start new businesses given the current socio-political situation. Instead, they prefer to start projects in the services sector and in commerce: the importation of manufactured goods presents minimal risks. The average profit margin in the garment sector–with its high risk–is at most 6 per cent maximum compared with 20-25 per cent for commercial activities, with their quick return on investment.

Many Russian managers in the garment sector are waiting for foreign investors to invest in Primorskiy Kray without any local charter for participation in capital, except land. Business services are very poor. "Even for local transactions, bank transfers can take two weeks to reach their destination", says one of the important managers in the sector. Commercial banks cannot play their banking role as interest rates (180-200 per cent in September 1995) are so high.

Human resources and training

All plants have their own specialists and technologists: designers, production managers, senior management, strategists (sometimes even too many of them).

The moderately skilled workers have an acceptable level of training on the existing equipment, but despite their long experience in the sector, new training programmes for new technology should be set up soon.

The major far eastern technological institutes and universities should be more involved with the development and training programmes especially in computer-aided design (CAD). It is necessary to increase the cooperation between industries and technological institutes.

The training at these institutes should be adapted to suit industrial needs. The technological courses should be reevaluated. They should include components in international economics, marketing, sales and purchasing.

The average month salary in Primorskiy in September 1995 was different at the different companies:

Salary	*Company*
US$ 57	Zodiaq
US$ 83	Zarya
US$ 109	Molodojnaya

It is estimated that the average monthly wage for moderately skilled workers is US$ 120. This figure is continually increasing, especially as automation in the sector is scheduled to increase. Over the next three years, the wage level is expected to increase around 15 per cent in real terms.

***(...continued)
markets companies are able to avoid paying some of the taxes. This competition deters more law-abiding people from carrying on with a normal and regular way of work. Retail shop owners prefer to be supplied by the parallel market to avoid paying taxes which creates a de facto impediment to local products.

Table 14. Evolution of average wages in the textile sector (United States dollars per hour)[a]

Country/area	*1980*	*1990*
United States	6.37	10.02
China, Taiwan Province	1.26	4.56
Republic of Korea	0.78	3.22
Hong Kong	1.91	3.05
Turkey	0.95	1.82
Thailand	0.33	0.92
India	0.60	0.72
China	0.26 (1984)	0.37

[a]*Source*: Werner International.

There are no reports of any wage system based on unit production or other methods that give an incentive to increase productivity and quality. It seems that all salaries are on a flat monthly basis.

Wages for workers with minimal skills in Primorskiy Kray fall between those in Turkey and those in the Republic of Korea, while the living costs in the Russian Federation, due to social regulations, are higher than in either of those two countries. It is impossible to compare these wage levels with India, Bangladesh or China. This is the major factor impeding competitivity and weakening the garment sector in industrialized countries.

This wage gap should, however, be offset by a productivity gain due to the higher average level of the Primorskiy Kray workforce. The use of unskilled workers in the garment sector has reached the minimum sustainable state, as processes become more and more automated.

Their is no official provision for temporary or part-time workers in Primorskiy Kray, which reinforces the inertia of enterprises.

A number of institutes provide training for garment sector specialists (see volume 2 of the report for details). Unfortunately, it seems there is no feedback or coordination between these institutes and the factories, and the gap between the educational programme and the industry's needs is large. The majority of those who complete training find employment in the factories.

Technological base and process organization

All the plant facilities have a fully integrated system for marketing, design, raw material supply, production, commercialization and sales and there is no flexibility to lay off or have workers to suit demand. All enterprises had to generate tasks internally and no system of subcontracting was ever put in place, even after privatization.

It is necessary to introduce flexible structures to supply process tasks such as cutting works, optimization of raw material design, and to start fragmentation of processes. The high cost of new technology or equipment and the training time needed to achieve good technical performance has changed the economic parameters imposed on the garment sector in European countries and Japan, leading them to regroup their activities by task and achieve an economically viable volume of production. It is too early to adopt the just-in-time method for managing supplies, which would reduce

costs because the method requires near-perfect organization up- and downstream, which is not the case in Primorskiy Kray. If just-in-time methods were introduced it would increase the vulnerability of the garment sector at the moment.

To ensure the quality of components bought from subcontractors, quality assurance methods should be implemented. In future, international quality control standards must be applied for all exports: failure to do this has been a technical barrier to buyers until now. It is time to start a conversion programme for unproductive managers with a wide experience in the garment sector and to prepare them (to train all workers) for their new jobs with new methodologies (quality task force meetings).

Material base

The shortage of power in Primorskiy Kray is a crucial problem for existing facilities and future investors.* It has been responsible for many delays in delivery time and for the cancellation of some confirmed export orders. The other infrastructure components (road network, telecommunications) should be improved to allow flexibility and speed in supplying the purchased components and subcontracted goods.

No raw materials for the textile/garment sector are manufactured in Primorskiy Kray, which totally depends on the Russian Federation, other members of the Commonwealth or international imports. In Soviet times, all materials were imported from the more western parts of the country (Siberia, Khrasnodar, the Black Sea area and the Urals). All imported raw materials was transported over the Transiberian Railway, which has a terminus in Vladivostok. Also at that time, the Primorskiy Kray garment sector imported the high quality raw materials from Japan and all haberdashery from Hong Kong and China.

The raw materials production situation in Primorskiy Kray has not changed. After privatization, all importation of raw materials from the western part of the Russian Federation was ceased, for a number of reasons:

- Reduction production of raw materials.
- Cancellation of subsidies for transportation.
- Drastically higher prices for railways transportation, making it uneconomical.

The raw materials for this sector now come mainly from China, the Republic of Korea, Lithuania and Japan. The volume of raw material imports decreased 50 per cent between 1992 (US$ 2.8 million) and 1993 (US$ 1.4 million). No figures were available for later years.

The biggest problem for the garment sector in Primorskiy Kray is the instability of the raw materials supply. Despite planned improvements to the infrastructure (road networks, telecommunications etc.) the region is expected to remain in the second rank in this respect, making it difficult to compete with

*Electrical current is cut off often without any warning, for three to five hours every day. This practice would deter any prospective foreign investor. Substitute energy (motor/generator set) is not economical and has adverse environmental consequences. During our interviews and visits, that day without electrical current or workers due to power cut, Zarya told us it had not received authorization from the local administration (for environmental and security reasons) to install oil tanks or generators.

countries and areas that have the potential to produce both the raw materials (textiles) and the clothing: Republic of Korea, China, Hong Kong and Lithuania.

C. Seafood processing

1. Industrial stocktaking

Primorskiy Kray is one of the nation's leading suppliers of fish and other seafood (fresh and canned). It insures 55 per cent of the total (basic) fish catch (assets fish held) by all Russian producers. It accounts for Primorskiy Kray provides 33 per cent of the total Russian fish processing capacity, 34 per cent of the fish commerce (frozen, salted), 45 per cent of the canned fish and 38 per cent of the fish flour.

Total production output in 1995 is expected to be.1,200,000 tonnes, including 300 million cans of seafood. The value of this production is estimated at R 266 billion.

In 1995, the food processing sector in Primorskiy Kray employed 50,000 persons, including 7,500 persons working in the non-marine foods sector. One fifth of the total number work at catching the fish.

The volume of the catch is decreasing, as can be seen in table 15.

Table 15. Fish catch in the Primorskiy Kray
(Millions of tonnes)

1988	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*
5.0	5.0	4.8	4.0	3.1	2.7	2.2

The main reasons for these decreasing figures are as follows:

- Depletion of fish resources (for example, the 1.2 tonne catch of pollack has dropped to 0.5 tonnes in the same area).
- Random displacement of fish resources and the lack of modern detection instruments.
- Reduction in the extent of Russian territory: fishing was formerly carried on in international waters.
- Restrictions on sending the fleet beyond the 200-mile limit.
- Technical status of the existing fleet.
- Political and economic changes.

New international quotas, especially in the Baring Sea and in the Sea of Okhotsk. Negotiations are still under way, with no compromise having been reached. The current Russian fleet cannot compete with the fleet of China and the Republic of Korea.

2. Processing capacities and market orientation

Despite privatization in 1992 and 1993, the fishing sector is still controlled by the Ministry of Fishing, which makes all strategic decisions and sets the objectives. The first reorganization rationalization of the fishing industry was done during the privatization period. Most of the existing plants have been merged and now form 10 large-scale enterprises. The management of the main fishing ports was also handed over to these groups.

Two major holding groups emerged: Dalmoreproduct (DMP) and Dalryba, which had first been formed in former times. Large foreign companies agreed to invest in these holdings and become shareholders. For example, Nippon, Suisan, Morikawa, Mitsui, Nipporos, Maruha and Taito Seiko (Japan), Hansung (Republic of Korea), Darco (France) and some United States companies now participate in DMP. Non-Russian capital in DMP amounts to 36 per cent. This international support allows DMP to compete internationally in the sector and is proof of the high level of foreign interest in the Russian fishing sector.

These foreign companies are involved in all aspects of the fishing industries: Mitsui is involved in ship building, construction and repairs, Maruha is involved in fishing and Darco is involved in trading. The technical assistance and financial and management support they provide should form a sound basis for restarting the sector.

Dalryba is supported by a financial and banking holding. In the Nakhodka region, the Free Economic Zone committee has provided part of the charter capital of small and medium-sized companies, for example Kven and BAMR. Some small and medium-sized private companies retain their autonomy, for example, Rybobkombinat.

There has been a great deal of continuity in the management of these companies. The former boards, with their long experience, are still in charge. Their knowledge of local and international markets allow them to carry on with absolute autonomy, and their relationship with the federal and local administrations goes deep. Despite their absolute decision making power, they have suffered from the cessation of government subsidies.

Some, young operational managers, educated in the Russian Federation and the United States, have set up training programmes in these companies. They have introduced new management methodologies as well as up-to-date information technologies that allow them to track performance, as was required by their international parent companies, to bring them up to international management standards.

The increase in exports has reinforced the commercial organization's structures and forced them to modernize. The growing number of direct transactions with international companies, the market share and competition in the fishing sector have not allowed commercial departments to continue treating the export market as they had once treated the domestic market.

The new organizational structures are suited to those of its partners. The commercial structures of international holdings in the fishing sector are reported to have been absorbed into the scheme of the parent companies.

Technology and equipment

Two fishing areas, Karayansky and Chovkodsk, provide two thirds of the catch for the Primorskiy Kray region. The other third comes from the following regions: Kamchatka, Sakhalin, Magadan, Khaboarovsk. Dedicated fishing ports in Vladivostok, Nakhodka, Troitsa Bay and Khasan County are

devoted primarily to handling seafood shipments. New private perths have been built on the same coasts by BAMR at Nakhodka and by Dalemoreproduct at Vladivostok.

The fishing fleet was constructed and equipped in the 1950s. Since the 1970s shipbuilding companies at Vladivostok, Nakhodka and Slavyanka have designed and equipped vessels for the fishing sector.

Ten production plants are located in the specially equipped port of Nakhodka: Svetlaiu, Kamenla, Vladimir, Valentin, Preobrazenia, Uznomorsk, Putiatin, Popov, Slavyanka and Zarubino. The facilities were designed to process 5 million tonnes of fish per year but are now running at less than 50 per cent capacity and in 1993 were processing only about 2.2 million tonnes. In 1994, the volume of product being processed rose to 2.9 million tonnes for a total fish catch of 1.077 million tonnes. Processing continues in existing factories, which have more capacity than is needed for current production levels.

Based on the visits to Yuzhmorrybflot (Nakhodka), Rebokombinat (Vladivostok), Prymorrybprom (Slavyanka), Dal Nivostochnaya Basa Flotta Po Ribeloustvoviobrabbodke More Producto (Zarubino), the following observations were made:

- Over extensive work space surface areas are used especially for the nominal production levels of the 1990s. At least some storage and refrigeration units should be revamped.

- The maintenance of the facilities does not conform to international standards. Housekeeping (leaks, insulation cladding, waste treatment etc.) could be improved at minimal cost.

- The treatment of marine pollution and wastes could be improved. A detailed audit is advised. Certain environmental problems have been noticed.

- An experienced workforce with low level skills is extensively used, and there is a minimal use of automation in the production process.

- Several neglected production lines lack spare parts, a situation made worse by the drop in production. Some of them need prompt modernization work.

- Buildings were left half completed and then neglected following a decision to stop investments or as a result of the failure of a recent joint venture.

- Although the rules of hygiene supposedly conform to Russian standards for food hygiene, it is doubtful whether they are being applied rigorously.*

- The urgent need for equipment and packaging materials was voiced repeatedly during our field visits. Likewise, requests were made for the revamping of existing equipment. The firms were for the most part equipped with canning production lines. Dried and smoked fish are delivered with a minimum of packaging.

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*We were assured that the required quality controls occur regularly, but we were unable to check this ourselves. We were also assured that a strict control is conducted regularly by the regional health and safety authorities, that the results are held by the central Primorskiy Kray administration and that no serious breach had occurred in the last five years.

- Most factories are equipped with the back-up power needed for the freezers and to insure the continuity of cold processing.

Several firms have installed processing units in the parts of the ports that belong to them: BAMR treats 80 per cent of its catch in Nakhodka and exports 20 per cent to be treated in Japan, the Republic of Korea, China and Europe.

Dalmoreproduct is starting work on a new port dedicated to fishing at Vladivostok. They own factory-ships that make long fishing trips (4-8 months), and that process and package the catch on board.

Yuzhmorrbyflot is located in a small settlement near Nakhodka.

From visits made to outlets distributing seafood products in Vladivostok, it seems important to mention that the modernization of existing packaging and retail equipment (open frozen fringes) must be audited taking into account maintenance of the cooling chain, the traceability of end products and adherence to international standards of sterilization and hygiene.

Vladivostok is located at the terminus of the trans-Siberian railway line. The railway link has been the only viable method of transport for products throughout the regions of the former USSR. The cessation of all government subsidies has forced the railway companies to charge real prices for freight. As the new prices are much higher and cannot be borne, the railway network is no longer used for the transportation of marine and seafood products to other parts of the Russian Federation.

In the Primorskiy Kray, there are no ships dedicated to the transport of fish. The fishing vessels themselves are used for such transportation, which is a far from efficient solution. Vostock Transflot is the only company to offer this form of transport, but its prices are prohibitive.

Marketing and products

As mentioned previously, the market share of the region's seafood products has fallen for technical and economic reasons, in addition to the reason that fish resources in the region have been depleted. Only, 1,078,000 tonnes were caught in 1994 in all fish and seafood sectors, of which 26,000 tonnes was seafood (crabs, prawns and shrimps).

The fish are taken from Russian territorial waters by small firms or from waters off the coast of Argentina by firms with more powerful fleets. The fleet capacity of the biggest groups, Dalryba and Dalmoreproduct, allows them to make much bigger catches.

Some firms do can fish for non-Russian firms in the Far East. This applies especially to raw fish foods for local consumption (sardines, seaweed and herring).

It is worth noting that the waters off the coasts of the Primorskiy Kray hold a rich diversity of seafood resources. Fifty different varieties appear in fishermen's nets and seafood.

3. Fish processing

In 1994, nine principal companies shared the fishing market in the Primorskiy Kray. They do not fish in equal proportion, but three bands can be distinguished. The lead is taken by VBTRF, followed by three companies of roughly equal size: PKRKS, Dalmoreproduct and BAMR, each accounting for 16-19 per cent of the volume. Then comes DFCBTF, a medium-sized company with 11.2 per cent of the volume. This leaves three small companies each with under 2 per cent.

Pollack is the most common fish variety off the coast of the Primorskiy Kray. The total quantity caught, around 902,000 tonnes, accounts for 83 per cent of all catches. This fish is very popular in the Russian Far East; it is sold tinned, dried, smoked and cooked.

Much further behind, 31,000 tonnes of herring are caught, while tuna, sardines and cod account for between 13,000 and 17,000 tonnes each. Flat fishes (e.g. burbot and narga, are up to between 1,000 and 7,000 tonnes.

The data for 1994 show that the fish is processed in four different ways: canning, cooling, freezing and other methods. Canned products accounted for 25.5 per cent of the total catch in 1994. Frozen products accounted for 20.3 per cent. Both the above are destined in large part for export. The proportion of products processed by other methods (refrigerating, smoking, salting and in ready-cooked dishes) also amounts to 25 per cent. These products are destined for local consumption.*

4. Seafood processing

Large companies also dominate the market when it comes to seafood. Effective market share is determined by the size and efficiency of their medium-sized tonnage fleets. In volume terms, two main products are enjoyed most by the consumer: calamari and crab, which in 1994 accounted for 59.46 per cent and 31.8 per cent respectively of the seafood caught.

In 1994, BAMR alone accounted for 92.13 per cent of the calamari catch: 24,352 out of a total of 27,000 tonnes. Two small companies, Turntf and DVBF, took 893 and 1,022 tonnes, respectively.

Calamari is a top-of-the-range product sold mainly for export. The same goes for the crab.

The Dalmoreproduct company is first in collecting crab. Its fleet takes 11,308 of the total of 13,861 tonnes (81 per cent), followed by four small companies, which take 383 tonnes (2 per cent). Independent fishermen accounted for 15 per cent of the volume in 1994 (2,170 tonnes).

Seafoods is either canned or partly cooked for freezing, but it was not possible to obtain accurate figures for the proportion of each product processed under each method. Furthermore, the new high-value-added product was launched in 1993 at Nakhodka: crab-flavoured sticks.**

The share of export products is increasing to the detriment of local consumption, mainly owing to the following:

- A price increase on the domestic market, for seafood products, which have become a luxury item. The relative cheapness of the price of imported meat (beef, pork and chicken) has meant that they

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*As an example, Rybokombinat in Vladivostok is a medium-sized company employing 500 persons. It had a production in 1994 of 3,133 tonnes and has a maximum production capacity of 12,000 tonnes. It produces products with high value added: ready-cooked dishes. This company, unique in the Primorskiy Kray region, is in crisis over the definition of its products as well as its market. It has lost a large market (which accounted for 20 per cent of its production) in ready-cooked meals for the Russian Navy based in Vladivostock. A thorough reappraisal of this plant's products for the local market or for export is recommended.

**This product is made with sliced treated fish and flavoured with crab, an interesting example of the new seafood products to be encouraged and promoted. The Kven company manufactures it from raw materials supplied by Dalmoreproduct. The results have been encouraging (116 tonnes in 1994 and a prospected 169 tonnes in 1995, with a workforce of 62 people). Further new products are also under development (one is fish sausage, which was scheduled to be launched in 1996).

are replacing sea products in the Primorskiy Kray market. The expedition of sea products by rail to the western Russian Federation and the Commonwealth of Independent States, has almost totally ceased owing to the high rail freight costs.

- The unannounced but de facto policy whereby management wants to export most of the output to earn the means of revamping and modernizing existing equipment and fleets.

Commercial and distribution infrastructures for seafood products are being completely rebuilt, and financial difficulties (such as unpaid bills) can arise. Fortunately, the price of seafood products in Primorskiy Kray are not yet at international levels, which gives them an advantage on international markets. People in neighbouring countries (Japan and the Republic of Korea) are big consumers of seafood products and have far greater purchasing power than people in the Primorskiy Kray. Several cargoes of live seafood products (crab, prawn, Sushi and other much sought after seafood) are sold and delivered direct to Japanese companies without passing through Primorskiy Kray processing plants.

Table 16 shows official export figures for seafood products processed by Primorskiy Kray companies.

Table 16. Official export figures for all Primorskiy Kray companies

	1992		*1993*	
Product	*Amount (thousand tonnes)*	*Value (thousand US$)*	*Amount (thousand tonnes)*	*Value (thousand US$)*
Frozen fish	59.8	34.508	105.7	138 048
Canned fish and seafood	1.5	43 623	1.9	58 305
Seafood products	0.1	170	2.6	7 020
Fish flour (1 000 tonnes)			7.0	3 739
Oily and fatty fish			4.0	1 330
Caviar and fish liver			18.9[a]	117

[a]Tonnes, not thousand tonnes.

By way of example, BAMR exports a major part of its crab and calamari production to Japan, China, the Republic of Korea and New Zealand. These desirable products return a greater profit than fish. BAMR's export share is 20 per cent but is largely compensated in price by the difference between seafood and fish. Dalmoreproduct, which has more powerful vessels and some sizeable ships adopts the same strategy: export to earn hard currency. The products made for export are for the most part canned crab, salmon, sardines and fish fillets, all of which are much prized in Europe and the United States. A large volume of derived products is exported for industrial consumption as well (fish flour, fish oil, fat products).

Under the former system, commercial and fishing cooperatives ensured the sale of sea products in specialized shops. These organizations were not adequately equipped for storage, packaging and distribution. Once they were privatized, which happened to all the large fishing cooperatives, they were bought up by the large fishing companies to complete the cycle from producer to consumer. The small

retailer tends to refuse to accept seafood products not properly packaged or canned as they may be damaged in transit. They do not have enough refrigerators and cannot ensure cold storage. A big effort needs to be made to improve the storage of frozen, chilled and preserved products which are sorely lacking in Primorskiy Kray.

Some of the new organizations have acquired shops equipped to international standards to insure the distribution of their own products. A showcase restaurant is attached to the shop. They have started to acquire equipment such as refrigerators and freezers so as to be able to sell the fresh and frozen products.

The last sector is the ready-cooked meals made by Rebobkominat, whose products are reputed to be high quality, even luxury, items. The disappearance of the market for this product has caused the company grievous problems.

Prices and taxes

Prices are set for the domestic market based on the following variables:

- Size of the catch.
- Size and quality of the fish.
- Cost of the fuel.
- State of modernization of the fleet.

(Two price settings) characterizes the fish markets. The price of fish following world trends in natural reserves of fish has fluctuated considerably over the last 20 years. The price of a tonne of pollack in 1990 was US$ 700-750 but fell to under US$ 200-300 in 1995. International competition forces producers to resort to (price) dumping to sell their products. The average price to the consumer in Vladivostok in 1988 was R 1.3 (about US$ 0.14/kg), and it was considered a popular basic food. The average price in 1995 was more than R 15,000/kg (US$ 3.33 in 1995, as per the average rate of exchange given by the Central Bank of the Russian Federation).

The price increase has weighed heavily on the local consumer, noticeably decreasing the per capita fish consumption. At the start of 1990, fish consumption in the region was estimated at 51 kg/yr/person, which has since fallen to 24 kg/yr/person, a decrease of 50 per cent. It should be noted that the Russian national average consumption was estimated at 18.6 kg/yr/person in 1990 and dropped to 9 kg/yr/person in 1995. The minimal annual consumption recommended by the FAO for a balance diet is 18.2 kg/yr/person.

The consumption of meat has tended to replace that of fish and marine products. In 1988, the price of fish was one seventh the price of meat. In 1995, the price of fish was double the price of meat.

Entrepreneurs, accustomed as they were to being heavily subsidized, expressed surprise at the different taxes imposed on the price of fish. The domestic and local fish market is protected by a VAT on imported goods of 18 to 2 per cent, which reduces imports for local consumption to a negligible amount.

Business services, new investments and investment climate

As already mentioned, the current trend is to sell most of the seafood production for export, which allows the products to be sold for much more that they would bring on the local or regional market. This strategy maximizes hard currency revenues, allowing factories to revamp and modernize. Decisions on new investments are made by the administrative councils of each group and depend on their own funds and the financial support of new shareholders. So far, no overall restructuring has been planned. Only urgently required action has been undertaken.

Some fishing companies have been bought up by banking groups recently installed in the Russian Federation, such as Dalryba. For example, 36 per cent of Dalemoreproduct's capital is held by foreign firms located *outside* Russian territory. The parent companies ensure financing from abroad and can avoid administrative and banking formalities, which are burdensome in the Russian Federation. Although the investments go through the Russian banking system, the administrative overheads are reduced to a minimum. It should be noted that any investment above R 100 million (US$ 23,000 in 1995) requires long authorization procedures imposed by federal and regional authorities.

The amounts and nature of the investments are decided by the administrative councils of each group where the representative of foreign parent companies are members. Investments are decided on the basis of group strategy, taking into account the interests of both the parent companies and the Russian subsidiaries. Loans to investors in certain companies are granted at international interest rates (6-10 per cent short-term), particularly for urgent repairs or maintenance. Some loans are reimbursed by exchange (barter system).

The support of parent companies for their Russian subsidiaries allows large groups not to be penalized by interest rates (180-200 per cent) is charged by Russian commercial banks.

By not belonging to a group with an international presence, small companies in the fishing sector find themselves penalized in their capacity to invest. Three alternatives are open to them in the short and medium term:

- Regroup to attain at least a medium scale.
- Allow themselves to be bought by large groups.
- In the medium term, disappear for lack of funds to modernize the existing plants.

The committee of the free economic zone at Nakhodka has also contributed to certain Primorskiy Kray fishing companies and has consented to granting loans at a preferential rate, but the sums it offers are not on the same scale as those offered by the international groups mentioned above. No investments of significant value have been made to allow Russian firms to buy new fishing vessels.

It was also reported that several joint ventures with foreign firms, United States, Japan and the Republic of Korea, among other countries are already underway or being considered. The range of investments is quite broad and reaches in several directions, principally in the acquisition of new canning technologies, new fishing equipment and factory ships and new processes for ready-cooked frozen meals.

Human resources

Some indicators for the seafood processing workforce in the Primorskiy Kray are shown in table 17. The number of employees was significantly reduced following privatization in the sector, with the reduction having been cushioned only by trade union intervention and with unskilled workers and skippers being equally affected. Although the overall volume of fishing and processing was slashed by half between 1990 and 1995, the size of the workforce shrunk by only 15 per cent. A considerable number of employees turned up at work but are non-productive: this is a welfare benefit in disguise. The situation cannot last indefinitely.

Fishing trips are long in duration and occupy the crews for 6-8 months of the year. For the rest of the year, the ships are in docks where they are overhauled and maintained.

A significant number of moderately skilled workers (for example, skippers of small ships) have left their profession to work in the commercial sector. Those who have the skills and know-how start up small commercial operations.

Table 17. Workforce characteristics in the seafood processing sector, 1990-1993

Indicator	*1990*	*1991*	*1992*	*1993*
Workforce (persons)	46 625	45 891	45 213	43 012
Average salary in the region (R/year)				
All sectors	363	677	7 354	84 305
Fishing/seafood sector	653	1 104	11 325	157 649
Industrial growth rate < 1 (%)		97.2	106.6	94.1
Productivity (base 1985 = 100)	119.6	113.4	122.6	114.5
Output (base 1985 = 100)	115.7	112.5	119.9	112.9

The fishing sector in the Primorskiy Kray has adequate structures to train personnel for all fishing and processing activities. One section of the Academy of Sciences, the Marine Section, is located in Vladivostok, and there are other specialist training centres and technology institutes as well. Most people in the profession come from these establishments.

Some investors insisted in the case of partnership and investment products, on intensive training for whole crews of Russian sailors and workers, as was the case for BAMR.The trainees were specially chosen and were taught by German Commanders. The training was tailored to their needs. It introduced them to the standards for products such as frozen fillets, much prized for export. A training programme for quality control should be undertaken to improve product quality and procedures to meet international standards.

The average salary in the seafood sector is practically double the national average. Large firms (Dalmoreproduct) wishing to achieve the same performance as foreign firms have raised salary levels for their senior management (captains and production managers), bringing them to the level of similar personnel in other countries. They are paid only during the fishing season. A skipper earns R 20-47 million per month and receives a bonus and products or stock option. Salaries in 1995 for moderately skilled workers were R 6-11 million per month. A bonus system operates to increase the productivity of workers at all levels.

D. Food processing

1. Overview

Table 18 gives an overview of the food processing sector.

Table 18. The food processing sector in Primorskiy Kray

	1990	*1991*	*1992*	*1993*	*1994*	*1995*[a]
Number of workers and employees	10 966	10 577	9 341	9 264	8 688	8 300
Average monthly salary (thousand R)	0.309	0.584	8.957	191.748	433.814	--
Value of output (million R)	576	1 532	15 107	162 684	370 000	820 000
Quantity of output						
Sugar (tonnes)	209 047	188 643	170 456	166 938	53 319	70 000
Vegetable oil (tonnes)	7 491	10 052	12 359	12 232	7 203	12 200
Margarine (tonnes)	18 630	19 776	17 646	12 677	6 649	7 000
Alcoholic beverages (thousand dal)[b]	2 175	2 034	2 030	2 169	1 430	1 000
Beer (thousand dal)[b]	6 967	6 987	5 279	3 619	2 758	3 000
Non-alcoholic beverages (thousand dal)[b]	4 494	3 301	872	638	435	350
Meat products (tonnes)	37 940	23 471	11 579	9 614	6 503	3 700
Sausages (tonnes)	27 454	23 737	16 204	15 120	16 596	14 600
Milk products (tonnes)	--	204 206	95 474	68 790	59 225	38 500
Fat (tonnes)	--	746	2 410	2 231	1 030	510
Confectionery (tonnes)	22 773	22 980	20 657	16 679	13 978	14 000

[a]Estimated.
[b]Decalitre.

2. Industrial stocktaking

The structural and economic changes brought about by the abrupt liberalization of the Russian Federation cannot be ignored. The import of foodstuffs has been liberalized, and a number of people have left production in the sector to take up commercial importation activities, still in the food sector, which bring them greater revenues.

The food industry sector is of strategic importance to the Primorskiy Kray, although in economic terms it is less important than other industrial sectors in the region. The food sector was the only industrial sector to benefit from federal subsidies in 1994, amounting to R 3 billion. This exceptional subsidy was intended to finance construction work on several retail projects whose completion had been delayed by restructuring. Federal subsidies were not, however, continued in 1995. Only R 0.2 billion was taken from the regional budget; this went into the development of an industrial milk processing plant.

In 1994, 8,600 people worked in this sector and produced an output worth R 370 000 million, equivalent to about US$ 104 million. Employment is in continuous decline. Production has likewise fallen. Figures provided in the annex show historical trends by product subsector.

3. Existing production capacities and market orientation

Fifty-one companies that had been privatized in 1992 and 1993 produce food in the Primorskiy Kray. They fall into three categories:

- Meat processing factories (9): sausages, semi prepared dishes.
- Milk and dairy products (cream, butter, ice cream) factories (19).
- Factories for processing foodstuffs such as vegetables, alcoholic and non-alcoholic beverages and confectionery (23).

The existing facilities are largely underutilized and some factories run below a profitable utilization rate (table 19).

Table 19. Production capacities of factories in the food processing sector

Food	*Nominal capacity*	*Capacity utilization (%)*
Confectionery	23 800 tonnes/yr	61.0
Alcoholic beverages	2 348 million dal/yr	61.0
Beer	9.8 million dal/yr	28.0
Non-alcoholic beverages	7.6 million dal/yr	6.0
Vegetable oil	16 000 tonnes/yr	45.0
Margarine	22 400 tonnes/yr	22.4

Retail prices have been put up to try to balance running costs and to earn money to revamp existing facilities. The profit margins have remained small, however, so that the products stay competitive with similar imported products. It should be pointed out that foodstuffs imported from South-east Asia or industrialized countries are manufactured in ultramodern automated factories.

The retail prices of imported products are highly competitive; this gives them the following advantages over local products:

- Lower sales price.
- Equivalent or superior quality.
- Good presentation (packing, conditioning).

Technology and equipment

Based on only a few visits and consultation with the Committee for the Food and Food Processing Industries, the following observations can be made:*

*This study deals with information collected in the course of two visits to facilities established before privatization. Both facilities are located at Nakhodka (the Gormolokozavod milk factory and the Nakhodinski meat factory). It would be unwise to extend our conclusions to all facilities having only visited two sites.

- The factories are too large for the current output and run below cost-efficient utilization levels. Reorganization of the sector is indispensable. Some were designed in the 1970s and use technology that is nearing the end of its life in 1995.

- Most processes were installed by local workers, and the products are exclusively for local and regional consumption. The level of automation is rudimentary. All tasks are done by hand, using a workforce with average skills trained on the spot to do these tasks.

- Conditioning and packaging machinery is virtually non-existent in the sector. Finished products destined for sale are delivered unpacked directly to retailers. The chain of distribution from manufacturer to consumer is simple and direct. No short- or medium-terms storage has been allowed for. All production is geared to direct sale to retailer and the daily delivery of goods, with a minimum of storage.

A detailed breakdown of the principal activities of the sector mentioning production volumes over the last three years is provided in volume II.

Material base

The alimentary sector of the Primorskiy Kray is dependent on imports from abroad or neighbouring regions for all its raw materials. Very few raw materials are brought from the western part of the Russian Federation as prohibitive railway freight costs make this uneconomical.

Local and imported alimentary products and their manufacture are described in detail in volume II.

All imported products manufactured abroad (for instance in China, the Republic of Korea and Australia) benefit from advanced technology, noticeable particularly in the way they are preserved and packaged. This has had a devastating effect, causing sales of certain similar local products to tumble, as they are considered to be outdated.

Many local products do not conform with the hygiene standards, not opportunity to check their conformity to the GHOST standard. Although a noticeable effort has been made, especially for new milk products, a global action plan and concerted effort are required in this sector. Apart from ensuring that the preservation and packaging methods satisfy food hygiene norms, it is also necessary to improve package design and to create new forms of presentation for the products.

Industrial management

The managements of privatized companies have teams of highly qualified technologists at their disposal who have extensive and detailed experience of the job. Before privatization, some technologists were promoted to executive management posts but did not have the opportunity to learn about market economy methods, product definition and modern management techniques. Their main objective at that time was to manage production in a protected market.

"Inexplicable sales losses" have made them aware of the need to reorganize management in line with the new realities of the market. Young management trained at specialized institutes have started to take the reins and are trying to reorganize the sector.

Product mix and diversification

As soon as privatization occurred and imports were liberalized, the Primorskiy market was flooded with new products from many countries, including European countries, the United States, Australia and Thailand but especially China and the Republic of Korea.

Of all the local products, meat products such as sausages and ham are the most popular and are considered delicacies. However their share of the market has dropped sharply, for the following reasons:

- Diminishing purchasing power of the local population.
- Increase in price to the public is attributable to the cessation of state and regional subsidies for energy and water, and the drop in productivity owing to working methods and obsolescent equipment.
- Increase in the price of raw material payable in hard currencies.
- Decrease in the volume of products manufactured and distributed to the market, from 27,454 tonnes in 1990 to 16,596 tonnes in 1994.
- Introduction of substitute products imported from China (canned meat, considered a staple, and certain bottom-of-the-range products), which are cheaper than local products.

The volume of dairy milk products experienced the same reduction, from 204,206 tonnes in 1991 to 60,000 tonnes in 1994. The Golmolokozavod milk factory has reorganized production. It is equipped with basic new equipment and buys its raw material (milk) outside the peak season at a reasonable price. It has been granted special aid in the form of a short-term loan of R 600 million at the preferential interest rate of 110 per cent from the Nakhodka Free Economic Zone committee.* The Golmolokozavod milk factory data furnished during the visit are given in table 20.

This example serves to illustrate the vulnerabilities and the opportunities of the food sector as a whole. The run-down facilities have been compensated for by the creation of new products, an overall reorganization of the workforce and the decision to invest in and install at least basic pasteurizing or sterilizing equipment. All this became possible once the shareholders and local and regional authorities had provided financing.

Products made in the Primorskiy Kray are mainly destined for local and regional consumption in the Primorskiy Kray. Official statistics do not show any significant exports, except in the seafoods processing sector.

The official distribution outlets for food products, scattered throughout the city centres and along major arteries, were also privatized. They were urged to retain most of their staff to avoid social problems, and they have also kept their same organization as before. Some have started to display imported products.

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*This loan was part of the launch of 10 new dairy milk and soya products (cheese, ice cream, chocolate cream, cakes etc.) inspired by similar foreign products already available on the market. Although a very special case, this example is nevertheless a promising one. The factory does have the advantage of a monopoly on dairy milk and soya products in Nakhodka.

Table 20. Recent dairy products volume

	1995 (first quarter)	1994 First quarter	1994 Entire year	1993
Number of staff	202	172	174	172
Volume of products sold (tonnes)	8 475	2 987	6 576	
Butter				
Cheese	6	9	14	32
Milk products	3 371	4 855	9 103	10 696
Ice Cream	85	47	181	214
Raw material processed (tonnes)				
Raw material from farmers	951	1 407	2 065	4 089
Raw material from plants	1 833	2 792	7 095	5 980
Others	737	677	740	420
Total	3 521	4 876	9 900	10 487

Prices and taxes

The selling price of locally produced food products is determined by three factors:

- Production overheads, including financial costs (interest payments).
- World prices for imported raw materials, paid in hard currencies that fluctuate in relation to the rouble.
- The selling price of similar imported goods.

The need to raise prices and reduce profit margins is also due to non-optimized production tasks, the poor state of the equipment and the high cost of raw materials and energy. This is not true in every case, particularly for products for mass consumption (alcoholic drinks, beers and soft drinks, ice cream and confectionery), where two distinct markets exist and two price tiers have been established: imported goods are sold for considerably more than equivalent local products.

Of course the taxes imposed on local manufactured goods seem higher than those imposed on imported products. For social regulations the Russian Federation imposes taxes on production volumes instead of on the value, as is the case with imported goods from China or the Republic of Korea, which end up being less taxed than local goods.

Business services and investment climate

Local investors are involved primarily with the import, advertising, sale and distribution of their imported goods. They have adopted modern marketing methods and installed efficient distribution and sales networks. The profit margins of products are greater. In due course, it is expected that some of these investors will rationalize their activities and begin to take an interest in the existing local food processing companies.

With short-term interest rates at 180-200 per cent, local commercial banks cannot support the revamping of existing facilities or commercial retail infrastructures. The Nakhodka free economic zone committee tries to finance some of the most urgent work. The lack of funds forces local investors to wait for foreign investors to bring in new technologies and take an interest in the existing companies. Once a more favourable and trusting climate has been restored, the zone could welcome new factories to be established and proceed to a new phase of manufacturing food products as much for the home market as for export.

Several contacts have already been established with investors from Japan, the United States and the Republic of Korea in the food processing sector. The activities currently focus on professional seminars, allowing investors to evaluate the situation and to propose cooperative solutions. It is judged that only the massive involvement of large, worldwide groups on a license brand name basis would allow radically reorganizing and restarting the food processing industries in Primorskiy Kray. These large groups could afford to finance all revamping operations by entering in the charter capital of the existing companies.

Human resources and training

All the technicians in the food processing sector were trained at specialized schools where the theory and practice were taught by professionals in the sector. Instruction on new technologies (automation, packing, quality control, promotion and marketing) need to be added to their courses, but the region already has technical expertise in engineering and the design of machine tools and other specialized equipment for the food industry sector.

The average salary in 1994 in the food processing sector was R 370,000. It is not easy to compare this sector with the seafood processing sector. In the course of revamping and introducing new technologies, this figure should be increased by an average of 25 per cent for this sector, and there will be further considerable reductions in the workforce, who will be replaced by a new generation of production tools.

4. Future potential

The massive import of all products in all ranges and the aggressive tactics of importers and distributors who use modern marketing and advertising techniques have changed the culinary habits of the population. Several new products that were unknown and impossible to find before perestroika, were introduced to the market at very competitive prices and have been widely distributed in the shops.

Some long-standing importers have found their local market niches after three years of experience in imports, and intend to become investors at the national level. After having acquired a perfect understanding of the local market, they are drawing up investment plans with international firms to produce under licence the products they are now importing and distributing. The best of this is Acfes.

Several niches could be very rewarding and require only medium-sized investments: beer and ice cream, for instance, are two opportunities being looked at. The Nakhodka Free Economic Zone committee project to install a plant to make tin cans with easy-open lids and to add a pasteurizing process to an existing beer factory should enable existing facilities to increase their capacity from the current 28 per cent and to produce beer similar to that imported from Thailand or Australia.*

*Furthermore, two brand-new, fully automated breweries are under construction at Nakhodka. They have a capital of R 10 billion. They employ 26 people and have a capacity of 660 tonnes.

There are proposals for several new high value added products (frozen and semi-prepared dishes) that could be launched using the flexibility and capacities of the Lesozavodsk plant: purchasing of sublimate lines for fruit and vegetable freezing.

Contacts between the Nakhodka Free Economic Zone and international groups need to be reinforced to improve promotion and marketing. Investment opportunities need to be offered to the far east regions of Russia and Sakhalin.

The need for a complete revamping and considerable investments seems obvious. International companies will not wait to offer their services but will instead take shares in existing companies after they have evaluated the market and rationalized their direct interests.

E. Shipbuilding and ship repair

1. Overview

Since 1992, the Government of the Russian Federation and the Kray have promoted the transformation of enterprises and accelerated the transition to a market-oriented economy. In the same way, the large State-owned enterprises or naval military industry shipbuilding and the ship repair industry sector were transformed into joint-stock companies.*

There are extensive facilities and quays for shipbuilding and ship repair in the cities of Vladivostok, Nakhodka and Slavyanka. These huge facilities have large floating docks, dry docks, slipways and cranes, including supporting factories, shops, machinery and equipment. Although they have been somewhat neglected for lack of financial support and are in need of investment for upgrading, they are still normally serviceable.

There is an abundance of local middle management and skilled workers for these facilities in the Kray. There are also material and equipment supply businesses that are capable of supporting their operation. However, they need to improve their professional management capability and fundamental technical skills and to convince potential customers that their business is viable.

Though there is no documentary evidence, it is said that ship repair costs more in the Kray than other districts and overseas. There is, however, a comparative advantage in the machine work, price and quality of ship machinery repair, which are well appreciated by domestic shipowners. It is, however, doubtful if domestic demand can be sustained over a long period, and the workload of the facility needs to be increased and supported by more work for overseas clients.

Future growth therefore depends on entering the international market. A large market certainly exists, but competition on a worldwide basis is keen.

The sector is confronted with a number of difficulties:

- Small sales volume compared with the scale of the facilities.
- High interest rate for loans, lack of a stable financing system.

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*The shortage of financial support from the Government has caused the national economy to decline significantly owing to the collapse of the production, distribution and financial systems. Constraints on financing for new investment and preparing operational expenditure of both the Government and the sector remain.

- Poor competitiveness, e.g. the docking period is longer than that of foreign competitors.
- Difficulty in procuring materials and equipment.
- Insufficient utilization of machinery owing to a shortage of spare parts.

To achieve sustainable growth and improve competitiveness, a number of measures are recommended:

- To establish clear strategy, a target and market planning.
- To create specialties that have obvious advantages.
- To specialize and diversify by downsizing.
- To upgrade facilities and basic techniques, raising them to the international level.

Based on the in-depth study of the sector and the recommendations contained in this report, the Government of the Kray has to develop an overall plan and clear guidelines for upgrading not only facilities but also support services, including a sound financial system. Both management and labour should have a good understanding of the market structure in the shipbuilding and ship repair industry and in a market-oriented economy generally.

*2. Current situation in the sector**

Mechanical engineering enterprises account for 13.2 per cent of total industrial output, and of this share shipbuilding and ship repair accounted for 19.2 per cent in 1994. Since 1989, the volume of work on warship construction and repair has declined sharply, but some of the lost volume has been replaced by non-military orders. The main facilities are shown in table 21.

The sector is controlled by the Committee of Industry within the Department of Shipbuilding; the Committee of the Fisheries Industry within the Ministry of Transport; and the Department of Sea Transport.**

The Government has taken seriously its programme of privatization and has welcomed and encouraged direct foreign investment to introduce advanced technologies into domestic industries and to increase productivity and competitiveness in the world market.

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*The only converted naval facility that could be visited in connection with this report was a former military shipyard.

**The Committee of Industry is in charge of ex-navy shipyards (for example Daljzavod), the Committee of the Fisheries Industry is in charge of Gaidamak and Diamid and the Department of Sea Transport is in charge of VSRP, NSRY and SSRZ. Each committee and department conduct administrative functions such as forming investment plans, providing fund subsidy before privatization.

Table 21. Major shipbuilding and ship repair yards in Primorskiy Kray, 1995

City	*Name of Shipyard*	*Business*	*Area (ha)*	*Main facilities and equipment for ship repair and shipbuilding*
Vladivostok	Daljzavod (ex-navy)	R and N	60.0	Mooring line: 1,600 m, 8 m depth Dry dock: No. 1, 170 m, H 34 m No. 2, 250 m, H 50 m FD: No. 1, 250 m, H 50 m No. 2, 200 m, H 32 m FC: 150 tonnes H 1 Cranes: 40 tonnes jib crane H 3 15 tonnes jib crane H 2 80 tonnes portal crane H 1
	(6,200 employees)			
	Vladivostokskiy Ship Repair Plant (VSRP)	R	4.0	Mooring line: 1,100 m, 8 m depth No. 1, 130 m, H 21 m FD: No. 2, 155 m, H 24 m FC: 25 tonnes H 2
	(1,100 employees)			
	No. 178 (navy)	R and N	..	..
	Diamidovskiy Ship Repair Plant (Diamid)	R	6.0	Mooring Line: 700 m, 8 m depth FD: No. 1, LCT 5,000 H 1 No. 2, LCT 1,200 H 1 No. 3, LCT 1,200 H 1 FC: 30 tonnes H 1 Cranes: 6 tonnes H 4
	(1,100 employees)			
	Pervomaiskiy Sudoremontny Zavod	R	4.9	Mooring line: 617 m, 8 m depth FD: No. 1, LCT 8,500 H 1 FC: 50 tonnes H 1 Cranes: 32 tonnes jib crane H 2 15 tonnes jib crane H 2
	(667 employees)			
	Vostochnaya Sudoverf Shipyard (VSZ) (ex-navy)	R and N	..	..
	ZVEZDA (navy)	R and N	..	..
Nakhodka	Nakhodka Ship Repair Yard (NSRY)	R and N	6.0	Mooring line: 800 m, 7 m depth Mooring pier: 210 m, H 1 and 170 m, H 1 FD: No. 1, 140 m, H 23 m No. 2, 170 m, H 30 m Slipway: LCT 2,000 tonnes H 1 FC: 50 tonnes H 1, 25 tonnes H 1 Cranes: 10-13 ton H 21
	(2,200 employees)			
	Primorskiy Zavod (PSRZ) Ship Repair Plant	R	1.0	Mooring line: 1,800 m, 7.5 m depth FD: No. 1-No. 4 total: 4 5,800-27.00 DWT FC: 50 tonnes H 1, 25 tonnes H 1 Cranes: 30 tonnes jib crane H 3 15 tonnes jib crane H 3 5 tonnes jib crane H 3
	(667 employees)			

City	*Name of Shipyard*	*Business*	*Area (ha)*	*Main facilities and equipment for ship repair and shipbuilding*	
	Daltexflot	R and N	..		...
	Primorremrybflot	R and N	..		..
	Gaidamaksky Ship Repair Plant (Gaidamak)	R and N	18.0	Mooring line: FD:	1,800 m, 7.5 m depth No. 1, 75 m, H 25 m No. 2, 50 m, H 20 m
	(600 employees)			Slipway: FC: Cranes:	LCT 3,000 60 tonnes H 1 30 tonnes jib crane H 4 15 tonnes jib crane H 1 10 tonnes jib crane H 1
	Active Fishery Co. (BAMR)	R	..		..
	Preobrazenie	R	..		..
Slavyanka	Slavyanka Ship Repair Yard (SSRZ)	R and N	60.0	Mooring line: Mooring pier: FD:	1,200 m, 9.5 m depth 300 m, H 1, 80 m, H 1 No. 1, 155.0 m, H 25.5 m
	(1,885 employees)				No. 2, 250.0 m, H 34.0 m No. 3, 266.0 m, H 35.4 m
				Slipway: FC:	LCT 2,000 100 tonnes H 2, 25 tonnes H 1
				Cranes:	30 tonnes jib crane H 3

Key: FD = floating dock, FC = floating crane, R = ship repair, N = new ships, LCT = lifting capacity in tonnes.

The following basic policies and development strategies have been put forth:

In view of its location, the distinctive features of its economy and its advanced development relative to other regions of the Russian Far East, the Primorskiy Kray should concentrate its efforts as follows:

- Intensive development of international cooperation for the purpose of transforming Vladivostok into a major commercial and financial centre with the necessary business infrastructure.
- Development of the transportation system, primarily sea transport, through active penetration of world shipping markets, renovation of seaports and modernization of the fleet.
- Conversion of the local defence industry, with its emphasis on mechanical engineering, to non-military, technology-intensive mechanical engineering applications, particularly in support of maritime industries.

The subsidies that have been granted to encourage the sector are as follows:

- The Conversion Program Fund Subsidy.
- Subsidies for modernization of the Russian fleet.

- Supporting fund for important sectors and businesses (R 30 million).

3. Output of the shipyard sector

The shipyard sector cannot be fully understood unless its relationship with the defence industry sector is looked into. The Kray's defence industry consists of 16 producers in the fields of shipbuilding and ship repair, mechanical engineering and aircraft construction etc.

According to government statistics, the outputs of the manufacturing sector in 1993 and 1994 accounted for 61.7 per cent and 59.0 per cent of GNP and R 1,846.1 billion and R 6,757.3 billion, respectively. The shares of machine-building and metal working in the output of the manufacturing sector were 13.9 per cent and 13.2 per cent and the sectors' shares of machine-building and metal working were 27.0 per cent and 19.2 per cent in 1993 and in 1994, respectively. Thus, the shares of the shipbuilding and repair sector were 2.3 per cent and 1.5 per cent of GNP and 3.7 per cent and 2.5 per cent of the manufacturing sector of the Kray in 1993 and in 1994, respectively (detailed data are presented in the annex).

For the fiscal years 1993 and 1994, machine-building and metal working outputs decreased 16.6 per cent and 25.5 per cent, respectively. In 1993 and 1994, the outputs of the shipbuilding and repair sector were R 69,248 million and R 171,553 million on a current price basis.

In 1993 and in 1994, the share of total employment in the Primorskiy Kray and the number of employees in the manufacturing sector were 27.3 per cent and 25.2 per cent, and 276,500 persons and 240,000 persons, respectively. The number of persons employed in the shipbuilding and repair sector was 25,428 and 21,648, and the share of the sector was 9.1 per cent and 9.0 per cent in overall manufacturing in 1993 and 1994. Both the absolute number of employees and share of the sector have declined.

4. Existing production facilities and capacities

The shipbuilding and ship repair industry in the Primorskiy Kray is spread out among Vladivostok, Nakhodka and Slavyanka, with the largest shipbuilding and ship repair companies and their plants being located within these cities. Since each shipyard is closely associated with the industrial condition of the city in which it is located, the workforce and labour costs differ from shipyard to shipyard leading to slightly different costs of shipbuilding and ship repair.

The 15 large shipyards in the three cities are listed in table 21. The shipyards are large and eminently suitable for shipbuilding and ship repair for their targeted customers. Data on the capacities of shipyards and the facilities they offer are shown in volume II of the report.

Except for welding sets, hand tools etc., the main facilities in the shipyards are about 20 years old and more. There has been insufficient capital investment in the past 8-10 years, with the present docking facilities and machinery being in need of investment to maintain them in good condition, for example as to floating dock, hull repairing, replacement of machines, some painting and clean- up. However, the main facilities, such as the floating docks, launching systems, cranes and most of the machinery, are for the most part serviceable.

When most of the shipyards were built and expanded, in the 1950s and 1960s, there was no supporting infrastructure or industries. It was planned from the beginning that the shipyards should be autonomous. Workshops such as the machine shop were equipped with all kinds of machines to handle everything from small pieces to large ones 12-14 m long and 2.4-3.5 m in diameter. Steel foundry shops,

electrical shops and hull shops were also incorporated amongst others. In other words, the shipyards were built without regard for the concept of optimizing use of facilities and equipment, instead aimed to be autonomous and be able to meet all contingencies.

At the beginning of the 1980s, new building and repairing of warships for the naval fleet and growth in the fisheries industry gave a sufficient workload and high productivity as well. In the latter half of 1980s, however, owing to the reduction in armaments and the decline of the fisheries industry, the capacity utilization rate fell sharply, from a high of 70-80 per cent at that time to 30-60 per cent at present. The shipyards of the Kray (have been confronted with threat of becoming mammoths ruined themselves because of their gigantic figure).

5. Potential for development

The Kray has a significant potential for industrial development because of its natural and human resources, its existing manufacturing plants and its favourable geographical location with respect to the TREDA countries. One fourth of the workforce is engaged in the industrial sector, providing a potential pool of labour.

The education level is comparatively high and the labour quality is also reasonably high in spite of the fact that labour costs are comparatively low, resulting in a significant potential for industrial development.

Most of shipbuilding and ship repair yards are old and decrepit, having operated for 20-30 years. However, the capacity and productivity of these shipyards will increase if they are upgraded, and most are conveniently located and provided with infrastructure.

Planning the reconstruction of these manufacturing plants will take a long time and a huge investment. However, they can be turned into a competitive industry by introducing new management, new technology and production control and adding of new products and services.

The Primorskiy Kray is bounded on the east and south by the Sea of Japan, on the west by China and on the south-east by the Democratic People's Republic of Korea, with TREDA connecting all four countries. Its proximity to these countries and to other Asian countries that have attained rapid development in the shipbuilding industry enhance the potential of its shipbuilding sector.

The market-oriented shipbuilding industry that already exists in China, the Republic of Korea and other Asian countries, where labour costs have been increasing, could collaborate with the industry in the Kray, where the labour costs are lower.

The companies in the sector can promote their own industrial development by establishing technical collaboration agreements with foreign investors and with countries such as Singapore, the Republic of Korea and China.

6. Sectoral development concept and future plans

The Government's development concept for the Kray and its policies and direct subsidies to the sector are not well articulated or generally understood. (Due to the absolute lack of budget allocation managers in the Sector have no clear positive guidelines to help them to implement the policy).

As a result, there has been no cooperation between the shipbuilding industry and the Government in the development of the sector.

After the start-up of privatization, both the Government of the Kray and enterprises in the Sector have been seriously soliciting foreign investment. They also welcome and encourage international cooperation through direct foreign investment that would introduce advanced technologies and increase productivity and competitiveness in the world market. However, the facilities to promote and encourage the flow of investment are insufficient. Among other measures, the establishment of a special agency to receive investment applications and the setting up of clear procedures, incentive systems and guarantees would make it more convenient for foreigners to invest.

Market structure

The ship repair and shipbuilding market, especially the international market, is adversely affected by structural factors as well as uncontrollable external factors, and it is very difficult to maintain a stable workload for long periods in a ship repair yard.

There are a number of large shipowners such as the Far Eastern Shipping Company (FESCO, Vladivostok), the Primorsk Shipping Company (Nakhodka), the Active Marine Fishery Co. (BAMR, Nakhodka), and Dalmoreprodukt (Vladivostok).

They rate the shipyards of the Kray as follows:

- Price (cheap → expensive): China → Russia → Republic of Korea.
- Technical level (poorer → better): mechanical machining: China → Republic of Korea = Russian Federation; painting: Russian Federation → China → Republic of Korea.
- Docking period (short → long): Republic of Korea → China → Russian Federation.
- Labour cost index: Democratic People's Republic of Korea (50-60) → China (60-70) → Russian Federation (100)

As labour costs account for 55-70 per cent of the basic cost of ship repair, it will be necessary to increase productivity and rationalize procedures in the shipyards of the Kray.

According to local shipowners, some of the weaknesses of the shipyards are as follows:

- Delivery and docking periods are longer than those of competitors.
- The quality of the paint work is poorer.
- There is a lot of obsolete equipment.

The significant comparative advantage is that the main shipyards of the Kray are located in Vladivostok, Nakhodka and Slavyanka, which have excellent regional and international ports and which are the base for large shipping and fishery industries. The cities are also strategically located at a gateway to the Pacific and in relation to the other countries of TREDA.

The disadvantages of the location have to do with the procurement of raw materials, machinery and equipment and the weather conditions. The places where machinery, steel products, and equipment are made, in eastern Europe, are far away. Because of the severe climate in winter, the ship buildings were constructed very strongly to protect against snowfall and necessary to heat by steam.

Management system and organization

There are two kinds of organizational structure in the shipyards of the Kray. One such structure is exemplified by the PSRZ and NSRY shipyards, which have already started downsizing and have established small or medium-scale companies on its workshops basis. This is a simple horizontal structure. The other is a vertical structure which is found at the other shipyards and ex-navy shipyards.

In both type of organizations, power and responsibility are over concentrated in the president or general directors and are not delegated to the heads of departments, who must therefore wait for the orders and directions from above on even petty matters. Such organization does not function without orders and direction from top management and seems to be a relic of the old centralized economic structure.

The following changes should be made:

- In the former type of organization, which is the preferable one, the heads of departments should be responsible directly to managing director.
- All policies or decisions are to be made through discussion at the top management level.
- All levels below heads of departments should also have power delegated to them.
- Every post, from managing director to the lowest ranked post, should have a job description that spells out the assignment, the responsibilities and the qualifications required for the post.

All shipyards transformed into joint stock entities began to prepare annual reports and annual corporate plans for shareholder meetings. The annual corporate plans describe the production plan, the facilities maintenance schedule, manpower, annual investment plan, financial plan and so forth, but do not contain any systematic medium- or long-term plan.*

The shipyards have different systems for managing production planning and process control, design control, material control, man-hour control, cost control, quality control and scheduling.

The volume of ship repair work, which is the main business of the sector in the Kray, fluctuates, as mentioned above, owing to uncontrollable factors and is closely related to production planning and process control. For this purpose, each shipyard makes an effort to secure orders from potential domestic shipowners. Each company and its management have to convince potential customers of its ability to control the duration, quality and cost of ship repair.

Now NSRY, PSRZ and others have reformed their organizations and control systems. A new management system is being introduced to the sector through the efforts of the companies themselves, along with technical collaboration by influential foreign shipyards or international organizations.

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*According to discussions at the shipyards visited, few shipyards have corporate strategies or policies in matters such as, participation in the shipbuilding market, maintenance of a good reputation, expansion of order, improvement of productivity etc. In addition, the business environment must be assessed in order to carry out the marketing planning that is inevitable in a market-oriented economy.

Marketing and sales function

In most shipyards, 3-4 persons are in charge of marketing and sales targeted at domestic clients and 7-10 technical persons help them to draw up technical plans and documents. Their promotion efforts for the local market mainly consist of the following:

- Sending tariffs and sales promotion letters.
- Quoting prices for ship repair work requested by shipowners.
- Enter into ship repair contracts on an annual basis.

To increase sales and to enter the international market, further efforts must be made in a number of areas:

- Marketing planning, including the study of trends in the world economy.
- Engineering and technical capabilities.
- Productivity.
- Information on trends in other industries related to shipbuilding and ship repair.
- Technical agreements.

The shipyards of the Kray have been exploring the possibility of entering the international market, and some of them have talked with shipyards in the Republic of Korea, Singapore and other countries about possible technical collaboration and the establishment of a joint venture. At present there is only technical collaboration and assistance from foreign machinery suppliers on a job-by-job basis. Collaboration with foreign suppliers and shipbuilders should take place on a licensing agreement basis so as to quickly acquire overseas technical and marketing expertise.

To avoid manufacturing pirated parts, the managers should convince potential partners of their ability to manage and perform technical assistance agreements. The following technical agreements with foreign corporations are necessary to enter the international market:

- Licensing agreements for diesel engines (MAN-B & W, MAK, Wartila etc.).
- Licensing agreements for boilers, cranes and materials handling equipment.
- Technical assistance agreements, including management systems for building new commercial ships and repairing them.

Technology and engineering

The basic design work for new ships is usually done by institutes such as the Marine Fleet Research Institute (St. Petersburg) and the Far Eastern Marine Research Institute. Detail designs, mainly for ship repair work, machining plans, piece drawings, outfitting plans etc. are provided by the design bureaux

of the technical departments, which employ 20-40 persons including manufacturing, mechanical and electrical engineers, naval architects, other engineers and draughtsmen.*

The shipyards that intend to enter the market for building new commercial vessels must reorganize their technical departments so they can manage the basic design. For instance, Slavyanka Ship Repair Yard intends to build 5,000 DWT general cargo vessel in cooperation with the Komsomolstk na Amure Shipyard. The diversification of products should be promoted and the basic design capability, including research and development, should be enhanced through technical collaboration with advanced shipbuilders.

Production

Recently, shipyards in the Kray have been working at only 30-60 per cent of capacity and there are seasonal workload fluctuations. They are obliged to produce in their own workshops all kinds of machinery parts and outfitting equipment, including furniture and sofas, because no shipbuilding-related industries exist in the Kray.

As there are inevitably gaps in the workload, a lot of employees have had to be dismissed. However, some shops are holding on to more workers than they need to do the jobs. VSRP has started to diversify the skills of its skilled workers to avoid idle hours.

The ability to control both productivity and cost can be improved by the following measures:

- Standardizing the working hours required for all production tasks and for each job.
- Monitoring material and labour costs for each job accurately and reporting them at periodic management meetings.

Shipbuilding and ship repair are basically assembly tasks requiring many kinds of materials, machinery, equipment etc. to be prepared in time prior to starting each task. The shipyards of the Kray purchase steel from Cheliabinsk, Chezepovetsk, pipes from Sinarsky Zavod, electrodes from Dazel and Komsomolstk na Amure and 70 per cent of the paint from abroad. Machinery parts for ship repair are supplied by a shipowner and the used equipment which is possible to be repaired reach 20-30 per cent on average. For domestic procurement, delivery times (on average, 5 months) and transportation costs are the two main problems. The average length of time for which steel is kept in stock is over 4 months in order to avoid the present lengthy procurement procedures.

One countermeasure would be to purchase materials and machinery of good quality at low prices and in time by localization and diversifying sources. The inventory of stock should be managed by computer, with withdrawal being accurately monitored. Inventory costs should be calculated for each job.

Repairs take a long time and docking periods are often lengthy owing to a shortage of material and spare parts. It is important to shorten the docking period in ship repair and to deliver the ship on schedule in shipbuilding, because a delayed docking schedule and delivery mean big losses for the shipowner and delay and disturb the working schedule, reducing the shipyard's productivity.

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*A design bureau has two functions: preliminary cost estimation during the discussion stage with customers and detailed design for repair and manufacturing.

The main causes of delay are as follows:

- Shortage of materials, equipment, component, spare parts.
- Delay in the issuance of drawings and plans.
- Poor climate.
- Lack of work force.
- Insufficient control of quality.

Scheduling consists of preparing, in bar chart form, a comprehensive schedule, master schedule, a materials purchasing schedule etc., and scheduling methods should be mastered.

Quality control

The quality of work is controlled by the Department of Technical Control and the Central Plant Laboratory in VSRP; other shipyards have similar departments and laboratories consisting of 14-25 inspectors in charge of quality control and testing. Daljzavod obtained an ISO 9000 certificate for its machinery shop.

Since the work volume of ship repair fluctuates according to economical and seasonal conditions and is expected to continue to do so, the employment of seasonal labour, subcontractors and training to give workers multiple skills should be considered.

Costing system and price offers

There is little documentary evidence on the costing system used, but according to those interviewed and anecdotal evidence, about 60 per cent of ship repair costs is for materials, labour and utilities and 18 per cent is for value added tax, profit and others.

When shipyards receive an inquiry for ship repair work, they review the specification. Once they have decided to quote, the documents are handed over to cost estimators, who figure out the work item by item, mostly based on their experience. They base the material cost of each item on a unit price list, the labour cost on a man-hour standard and the utilities cost on their estimated total expense per fiscal year and past records. After getting all the estimates, they add the general expenses and the company's profit to arrive at a quote, which takes into account current market price.

It is said that shipyards in the Kray are less price competitive than those of China, which are 10-15 per cent cheaper. The cost estimation system for ship repair work should clearly state the composition of the total cost.

Human resources

Whether or not an enterprise is able to conduct its business activities smoothly depends on the ability of its managers. The following management system should be introduced:

- Corporate strategies and medium- and long-term planning.
- Marketing planning.
- Decision making based on reliable data.

While there is no single best method of management, the resources of an organization are important in changing the management system. The shipyards Daljzavod, VSRP and Gaidamak recruit their staff and officers from universities and vocational institutes. Technical skilled labour is recruited from vocational technical institutes, and every year, 30-80 new employees are retrained at a training center for 3-4 months. VSRP has a course to teach skilled technical labour additional skills.

IV. PREREQUISITES FOR DEVELOPMENT

A. General

The most general recommendation for the further development of the sectors discussed above is to formulate the appropriate policies and to create a business environment in which a market-oriented economy can work effectively to ensure the economic benefits of investment.

It is very important to realize that the effectiveness of the measures and action plans recommended here depend crucially on the desire of the people concerned to improve the industries of TREDA in cooperation with the governments. The governments, in turn, must bring their legislative process and legal standards into line with internationally recognized rules and standards.

B. Issues and tasks for development

1. External factors

External factors such as socio-economic conditions, government policy, infrastructure, market, institutional condition etc. form the business environment in which an industrial organization operates. They affect the management of an organization but cannot be directly managed and controlled by a manager. While socio-economic conditions in the three countries are different, to some extent the problems are the same.

In Yanbian Prefecture the overall economic situation is better than in the Primorskiy Kray and the Rajin-Sonbong Zone. However the main issues-controlling inflation and promoting growth-remain the most important task of the authorities in all these places.

In the Primorskiy Kray, price inflation has increased rapidly, among other reasons because of the introduction of value-added tax and the abolition of budgetary subsidies for transportation. Unemployment is gradually increasing year by year. The Government of the Kray should take all measures to improve political and economical stability in cooperation with the Government of the Russian Federation.

The Rajin-Sonbong Zone has been declared as the region where a more liberalized economic system will be in force. The decentralization of decision-making is of immediate importance. Apart from that, price distortions and the influence of central planning still make the economic conditions in the Zone unspecified in real terms.

The Governments should encourage the growth, coordinated development and promotion of TREDA and in doing so should issue a comprehensive statement of the promotion policy for all the sectors.

2. Supporting financial system

The lack of a suitable financing and banking system for industry has retarded economic development in TREDA, so the need to establish one is very urgent. One of the most important tasks is to generate local funds to match expected foreign investment. In all countries the most important obstacle to creating a joint venture is the structural financial weakness of the local partner. All possibilities for generating local funds should be explored.

3. Infrastructure and related industries

The shortage and low quality of electric power, fresh water supply and loads etc. has inhibited the stable development of the various sectors. The transport network has not yet reached the requisite level. To ensure stable growth in all the sectors it is necessary to generate more resources for infrastructure development and to coordinate efforts to develop the transport system.

C. Internal factors

Internal factors refers to the resources of an existing organization, i.e. its facilities, management, organization, product, technology, sales, cost and location, all of which can be directly managed and controlled by a manager. An analysis of the strengths and weaknesses of the enterprises in the sector shows that there is much room for improvement of these industrial development aspects.*

1. Facilities and equipment

Facilities and equipment in existing companies are generally old and need investment to allow modernization and upgrading. As described in chapters I-III, there are big differences between individual countries and sectors. A long-term strategy for the policy makers should be to create modern processing facilities based on technology that meets world standards.

Bearing in mind financial constraints and the need to set priorities, two aspects should be carefully examined when making decisions:

- Investment in equipment and technology in the most sensitive parts of technological processes as well as in improved packaging and quality control should be considered first.

- The technology level adopted should reflect the labour intensity appropriate to take full advantage of low labour costs in the region.

2. Management systems and organization

Management systems and organizational structure are normally two of the weakest elements of company culture in the region. A few companies in TREDA are now managed according to modern standards, but for the most part market-oriented management systems do not exist.

The introduction of modern management systems geared to exploiting comparative advantages of quality, cost, design and performance is urgent. In many cases such changes are less costly and will increase productivity and sales more than costly capital investments.

Corporate strategies and long-term plans should be introduced and mastered for all sectors, subsectors and companies. They should be based on government policy, industrial management systems and marketing planning, and should be associated with management reforms, the delegation of power, and accountability on the part of managers for the commercial decisions made by them.

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*See details in volume II of the report.

3. Products and technology

Products and services in the sector should not only match the resources available but should reflect market demand and determined competitiveness levels. In many cases these basic rules are ignored and replaced by a desire to introduce ultramodern equipment and technologies not taking into account the existing competition on the world market.

New production technology and computerization should also be introduced to less advanced and more labour-intensive enterprises.

4. Sales and marketing

In all three countries there is a heritage of neglecting active marketing when the demand is greater than production capacities. In extreme cases all the production has been distributed according to a central plan.

Many companies and branches have already been exposed to sharp, if not shocking market conditions. Despite this, marketing skills and strategies have neither been developed nor adopted in most of them, although some good examples already exist, mostly in the private sector. This is one reason why sales are in many cases less than production capacities.

The introduction of modern marketing concepts will immediately improve the strategic position of most companies, exploiting TREDA's location as a gateway to the Pacific. Cost estimation and monitoring systems should be introduced to bring productivity up to international standards.

D. Specialization between the three countries

In many areas the existing industries compete with each other, for example, in textiles and garments, traditional medicines, building materials and fish processing. On the other hand, however, there is already some specialization between the countries. As mentioned in the first three chapters, there is a substantial machinery and metal processing industry and a marine food processing industry in the Vladivostok, Nakhodka and Slavyanka area, steel making and light industries at Chongjin, and an oil refinery in the Rajin-Sonbong Zone (both in the Democratic People's Republic of Korea), and paper, chemical and food processing and light industries in Yanbian Prefecture.

Development plans must be coordinated immediately. It is difficult to predict to what extent such coordination will be based on intra regional agreements and integration strategies. That adds even more importance to any internationally sponsored activities and studies showing dangers and obstacles coming from short-sighted and wrongly conceived competition.

It is very important for the TREDA Governments to elaborate their sectoral development strategies and to make best use of their considerable basic identification, their market niches and their comparative advantages. Companies should study for themselves the market prospects instead of grabbing and copying some ideas that already have been successful in the region, which in the medium and long term could even eliminate them from the market.

V. RECOMMENDATIONS FOR A SPECIFIC SECTOR IN THE THREE COUNTRIES

A. Recommendations for industrial development in the Rajin-Sonbong Zone

1. Light industry

The following recommendations are made:

- Rajin-Sonbong City should be considered one market rather than fragmented into two local markets, Rajin City and Sonbong City.

- Factories should specialize in order to achieve better efficiency through economies of scale. In the textile and garment group:

  - The Sonbong Textile Factory should concentrate on producing artificial silk/lining cloth and relinquish the production of knitted underwear to Rajin Knitwear, which has more underexploited design capacity and specializes in knitwear.

  - The Sonbong Garment Factory should merge with the Rajin Clothing Export Factory. The Rajin factory has better machinery (e.g. power-driven rather than manual buttonhole makers and button sewing machines). Also, the Rajin factory will have the future advantage of container facilities at the Rajin port and it already has the advantage of a railway goods station. These advantages will become more critical as foreign contract customers (customers wanting garments made from material they supply and looking for the fast turnaround of that material) are actively sought. Such a merger would also mean that the factories no longer compete against each other for very scarce materials.

- In the foodstuffs group:

  - The Sonbong Foodstuff Processing Factory should merge with the Rajin Disabled Soldiers' Foodstuff Processing Factory. The Sonbong equipment is old and the capacity is smaller than that of the Rajin factory. The Rajin Meat and Fish Processing Factory should stop making vodka, allowing the Bean Paste Factory and the Disabled Soldiers' Factory to use more of their capacity. Rajin Bean Paste may also consider eventually relinquishing the production of vodka to the Disabled Soldier's Factory.

- In the garments and textiles subsector, enterprises in joint ventures will be able to undertake market-type negotiations, those not in joint ventures will retain the present centrally planned system of operation. At present, enterprises can make non-stipulated products or other than normal products and obtain materials for such production outside of prescribed procedures when special situations arise, such as a deficiency of materials at the factory. A critical deficiency of materials has existed in the subsector for some time. Waiting for a joint venture to develop would only prolong the inefficiencies that now exist by virtual low capacity utilization.

- For the purpose of exploiting underutilized facilities, it is proposed that enterprises in the subsector be permitted to use private corporation management techniques but retain State ownership, control and accountability. That is, they would have boards of directors appointed by the Government that function like boards in a private firm or like boards in joint ventures in the Zone. As well, a firm would have a team of managers, accountable to the board, that would function as managers do in a market system. The enterprise's senior management would be reoriented to address the total management problem as dictated by the market. (For more comprehensive coverage of the

recommendation and actions needed, see "Sectorial assessment-garments and textiles" in Volume 2.) Such reorientation would open the way for the firm to borrow funds to obtain materials, to negotiate directly with customers and suppliers of materials (e.g. it might have an employee or agent stationed in, say, China to negotiate contracts and source raw materials) and to control their staff requirements.

- Although two joint ventures already exist with Japanese partners, there is considerable room for additional investment in the fish and shellfish subsector to take advantage of the export potential. Nearly every facet of the industry must be modernized to realize the potential, particularly as regards sales to Japan. The United Nations and non-governmental organizations could be asked for assistance, particularly for the fishing cooperatives in the Zone.

- The Rajin-Sonbong Zone should be publicized outside TREDA as well as within. One method is to advertise in financial publications, e.g. *The Economist, The Financial Times* and the *Far Eastern Review*. Furthermore, the Investment Promotion Service of UNIDO should publicize subsector enterprises in the Zone by advertising for joint venture partners.

- At least one of the nine planned industrial estates should be constructed immediately. Potential investors need to see actual development rather than just hear about plans.

- Some training, e.g. in the English language and in management techniques, to acquaint national employees with the new roles they will play in the Zone is already being conducted by the Democratic People's Republic of Korea at Chongjin. However, various other types of specialized training will need to be conducted, e.g. all facets of management training, training for directors of boards, and training in marketing, distribution, materials supply, logistics, financial decision-making, computers and software, corporate strategy and monitoring. A donor organization could be approached about building a facility for this purpose. In the meantime, UNIDO should be asked to identify the specific needs in the Zone and put together a strategy for the implementation of such training.

- If the Government does not have contingency plans to deal with potential problems stemming from the effects of a dual economy in the Zone, it should draw them up as soon as possible. A policy of corporatizing the non-joint-venture firms in the Zone should be considered in the deliberations. This would give non-joint-venture firms in the Zone access to management and marketing tools similar to those available to joint-venture firms. UNIDO's cooperation and advice should be made available to the Government to assist in the development of such policy.

2. Traditional Korean medicine

The future development of the traditional medicine industry in the Democratic People's Republic of Korea should start with the restructuring of the existing industrial base and should exploit rich natural resources in the region. The following actions seem to be most urgent:

- Sonbong Pharmaceutical Factory should be given priority over the Rajin Pharmaceutical Factory because it is larger, has enough land for expansion, more space to house advanced equipment, a larger number of qualified personnel, better equipment and better production technology. Since some of its products have strong domestic or international markets, the Sonbong Pharmaceutical Factory is worth improving and modernizing

- Of the many subsectors of the pharmaceutical and traditional pharmaceutical industries in the Rajin-Sonbong Zone, the dioscorea subsector, the Korean ginseng subsector, the biopharmaceutical

subsector and the marine medicine subsector should be given priority because of the abundance of raw materials and strong existing and potential international markets in the Netherlands, Germany, China, Japan and South-East Asia.

Based on these priorities the following measures are recommended:

- Establishment of a dioscorea industry by the full utilization and modernization of existing capacities at the Sonbong Pharmaceutical Factory. The workshop for diosgenin production should be expanded and modernized as the existing capacity is too small: only one tonne of diosgenin can be produced a year, but it could be expanded up to twenty tonnes. The existing workshop should be revamped and expanded by introducing new technology and advanced equipment from abroad

- Development of the gingseng industry at the Sonbong Pharmaceutical Factory, with full and steady supply of ginseng raw material meeting World Health Organization (WHO) standards for agrochemical residues in the product. Establishment of a workshop for the production of standardized ginseng extract and its preparations.

- Modernization of the biopharmaceutical industry at the Sonbong Pharmaceutical Factory, which has a certain technological base and production capacity for manufacturing biopharmaceutical preparations. In the long term, the Factory should introduce modern biotechnology, including the engineering of enzymes, genes, cells and so on to produce advanced biopharmaceutical products such as tumour necrosis factor, human growth factor, interferon to meet the health care needs of the country's people in the twenty-first century.

A tentative action plan for the development of traditional Korean medicine in the Rajin-Sonbong Zone is presented in annex II.

B. Recommendations for the development of light industry in Yanbian Prefecture

1. Light industry

As far as the development of industrial strategies and concepts is concerned, Yanbian Prefecture seems to be the most advanced of the three areas. In the wake of numerous studies the basic direction of industrial development has already been set. At the current stage, implementation and aspects and regional distribution of the industry have to be considered the most important.

Yanbian Prefecture has already experienced some negative consequences as a result of the emphasis on development at Hunchun. The development of that Zone, which undoubtedly has enormous potential, has produced some distortion in resource allocation. The current concept of geographically balanced industrial growth seems to be much more advantageous for the region. This is especially important now, because the transportation systems through and in the Democratic People's Republic of Korea and the Russian Federation ports are not fully developed.

The chosen development strategy should ensure the full utilization of natural resources. A review of potential investment projects before the Investors Forum in 1995 revealed that the light industry development in Yanbian should go far beyond traditional products based on Changbai Mountain biological resources and the processing of minerals.

The development of light industries based on abundant raw materials seems to be inevitable. The long-term priority is to strengthen the high-tech industries. The medium- and short-term priority is to make the optimal use of existing natural resources and increase the share of high-grade industrial

products. According to the studies that evaluated different factors, the following industries should be given a priority:

- Food processing should concentrate on developing more higher-value-added products and on supplying new processed products to the domestic and international markets. Special emphasis should be placed on soft drinks, instant food and health foods.

- The manufacture of building materials should not be limited to the simple processing of minerals and stones, but should concentrate on high-grade products such as insulation materials and tiles.

- The textile and garments industry should follow world trends in natural and mixed fibres, taking advantage of existing facilities, natural resources and the labour force.

- Various subsectors of the chemical industry as well as paper and pulp processing also have a good potential for development.

As important as it is to optimize development strategies at the current stage, the management and marketing systems will need further reform and permanent monitoring and adjustment of industrial policies will be needed. Two aspects seem to be most important:

- The active promotion of industrial projects both within and outside the country.

- The creation of permanent training schemes to help introduce new technologies, marketing and management concepts.

Structural concepts for industrial development in Yanbian Prefecture are presented in annex I.

2. Traditional Chinese medicine

The future development of the traditional Chinese medicine industry should start with the restructuring of the existing industrial base and should exploit the rich natural resources in the region. The following actions seem to be most urgent:

- Development and modernization of the traditional Chinese medicine industry so as to allow the manufacture of medicines for the treatment of difficult diseases.

- Development of the dioscorea industry at the Hunchun Pharmaceutical Factory and the Yanji Phytochemical Factory, which now have production capacities of 30 tonnes of diosgenin each. These capacities should be fully utilized, to produce 60 tonnes of diosgenin.

- Development of the production of hydrocortisone.

- Development and modernization of the ginseng industry at the Antu Pharmaceutical Factory to exploit the potential markets for ginseng products in China and abroad, including the introduction of new technology for the production of ginsana (G115).

- Modernization of the subsectors for other traditional Chinese medicines, such as *xueshuang-ximaning* (anti-embolism and cholesterol-lowering medicine) made at the HuaKang Pharmaceutical Factory and the heart-protecting milk made at the Antu Pharmaceutical Factory.

- Development and modernization of the health foods and drinks subsector.

These steps should be combined with a number of technical refinements, including the following:

- The introduction of GMP standards and enhancement of quality control.
- The diversification of dosage forms (so far, the enterprises have developed too many oral liquids).

A tentative action plan is presented in annex II.

C. Recommendations for light industry and shipbuilding in Primorskiy Kray

1. Textile industry

More than one strategy should be laid out, depending on the short-, medium- and long-term interests and potentials.* The main elements to be considered include the following:

- Type and volume of markets: international, local (Primorskiy Kray), regional (Siberia, Mongolia, TREDA) or national (Russian Federation, Commonwealth of Independent States).
- Distribution network: discounters, supermarkets, hypermarkets, retail sales to individuals, small and medium enterprises, mail-order sales.
- Technical choices and levels of investment: high-tech industries (with fully automated systems) including design, processing, management and inventory management, or fully manual systems with the same functionality or an optimal mixture of theses choices.
- Competitiveness factors: fashion, price and quality.

It seems quite clear that the proposed strategy should allow the Primorskiy Kray garment sector to implement and launch plans that take into account the following factors:

- Lack of raw materials in the Kray.
- Availability of highly skilled workers and the shortage of low skilled labour.
- Moderate wage demands of the work force.
- Existing equipment unsuited for expansion or to access new markets alone.
- Temporary insufficiency of funds and lack of new investors.
- Small and non-aggressive sales force.
- Modest volume of the regional market (the far eastern part of the Russian Federation).

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*The optimal strategy should be set taking into consideration the market characteristics: range of products and type of consumer (men, women, children and domestical utilities); purpose of clothing: official daily clothes, sport, leisure time, "at home", work time; type (low, medium and high) and design: non-brand-name products, brand-name products, basic generic products.

- Competition from the rest of the region, including the Republic of Korea and China.*

Clearly the existing garment companies in Primorskiy Kray will not be able to continue producing inappropriate products by inefficient processes (see annex III). The restructuring tasks should consider the multiplicity of market types and competitiveness factors.** Training, including retraining, by international specialists of all management staff is one of the top priorities. Scenarios and action plans for the sector are presented in annex IV.

The clothing business sector in the Primorskiy Kray can only be sustained if the community as a whole–producers, suppliers and public authorities–are willing and able to accept their new position and to overcome the considerable challenges facing them. It would be a considerable benefit to the community at large if they can find a way to reinvigorate the sector.

2. Food and fish processing

The Primorskiy Kray has come to develop its food processing sector, firstly to provide for the home market and secondly to limit imports. In case of fish processing, there is already a big export potential.

The key supports for the food processing and seafood processing industries in the region are evident, and all are in need of revitalization:

- The facilities (shipbuilding yard, docks and processing plants) need to be reorganized. Some need closing down and others need modernizing to increase efficiency. The workforce needs to be trained to work on updated equipment and for the products to meet international hygiene standards.

- Transportation and storage system.

- Financial resources. New international joint ventures could be an important form of cooperation to compensate the lack of proper funds. A better climate of implementation would attract international investors; for instance, the complicated formalities and taxes outside the Nakhodka Free Economic Zone could be reduced. The internal market should interest medium-size international groups willing to be shareholders in existing companies.

In conclusion, the redevelopment of the sector would require the commitment of local investors supported by the expertise of worldwide leaders in the sector. Setting up new joint ventures on a licence basis should enable revamping and modernizing the existing facilities. That would also allow the Primorskiy Kray branch companies to have access to the methodologies of the parent companies.

Clearly there is a need for a complete revamping, requiring considerable investment. International concerns will not wait to offer their services but will instead take shares in existing companies, following a market evaluation and a rationalization of their direct interests.

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*The new policy of the Japanese sewing and garment industry is to relocate production outside Japan. This could be beneficial for the Kray and could give it a good chance for restructuring the sector.

**It is time to start splitting up the huge *kombinat* structures and facilities into dedicated smaller process-based units with sectoral niche specialization: Men, Women and Child clothing, Underwear, Mattresses, Blankets, Furniture etc. Each sub-segment and each product has its own rules and markets. There is not yet the wide distribution networks for clothing (supermarkets, hypermarkets, or discounters) in the Russian market. Only one level of broker exists between the producer and consumer. No intermediate structures (wholesaler, half-wholesaler) exist in the sector. The new free market rules and distribution methods take a long time to start. Training including retraining, by international field specialists, of all management staff is one of the first priorities.

Action plans for the sector are presented in annex VI.

3. Shipbuilding and ship repair

The shipbuilding and ship repair industries are comprehensive industries with relation to materials, machinery, equipment of advanced technology and labour-intensive industry. There are no restrictions on the customers. The shipyards of the Primorskiy Kray have started to be reorganized and to be privatized as joint stock companies (annexes VIII and IX).

The shipyards can play important roles both in the Kray and in TREDA, serving as a core for the industrialization of the region and promoting maritime industries in cooperation with the marine fishery and shipping industries, and as main manufacturer of industrial machinery for the consolidation of infrastructure development.

Various constraints retard the growth of the sector. A lack of clear and comprehensive government policies causes inactivity and stagnation, which is why the government should organize a development task force to encourage the implementation of the Policy Statement.

The following measures would help to restructure the sector:

- Establishment of an industrial financing scheme, to redress the lack of a stable financing system and high interest rates on loans for privatized industries.

- Introduction of education and training programmes to raise the level of engineers and to improve the skills of workers.

- Elaboration of strategies for survival and growth, including measures to improve productivity and growth.

It is recommended that the restructuring should be started immediately in cooperation with advanced foreign shipyards or consultants based on the feasibility study and implementation programme.

A detailed description of programmes and action plans is presented in annex X.

Annex I

DEVELOPMENT PLANS FOR LIGHT INDUSTRY IN YANBIAN PREFECTURE

Table A.1. Economic development plan of Second Light Industry Bureau
(Tens of thousands of yuan renminbi/tens of thousands of United States dollars)

Project title	*Name of enterprise*	*Total investment*	*Loan*	*Equity*	*Planned production capacity (tonnes)*	*Planned output value*	*Planned tax and profit*
Melanmine powder production line	Tumen National Plastic Factory	700/85.4	540	140	4 000T	3 500/426.8	751/91.6
Three-layer compound film	Tumen National Plastic Plant	3 000/365.9	2 540	140	5 000T	8 000/975.6	1 640/200
Fresh keeping film	Yanji Resin Plant	7 522/917.3	6 772	750	1 600	22 000/2 682.9	4 000/478.3
PVC pipe	Yanji Plastic Plant	1 000/122	850	150	3 000T	21 000/2 560.9	3 600/439
Steel and plastic component pipe	Helong Household Products Plant	267/32.6	207	60	1 000T	1 500/183	254/30.9
Electric cookers	Longjing Household Appliances Plant	1 500/183	1 200	300	20	8 000/975.6	1 440/175.6
Leather products	Longjing Leather Plant	1 000/122	800	200	30	7 000/854	680/82.9
Total		14 989/1 828.2	12 929	2 060		71 000/8 658.8	12 365/1 508.3

Note: Exchange rate US$: 1 = Y 8.2.

Table A.2. Investment plans for selected sectors
(Tens of thousands of yuan renminbi)

Sector	*1992*	*1993*	*1995*	*1996*	*1998*	*2000*
Food processing	8 751.278	11 342.11	19 709.46	25 890.18	48 785.835	91 285.054
Beverage	9 712.954	13 096.85	24 634.21	33 666.16	73 151.421	157 834.32
Tobacco	21 616.22	30 303.24	61 608.97	87 537.03	167 939.23	319 935.03
Textile	8 231.845	9 273.230	12 174.04	13 899.78	20 180.164	29 093.232
Sewing and leather	3 351.813	4 443.308	8 077.735	10 853.10	23 474.191	50 416.894
Furniture	913.0955	1 124.167	1 762.868	2 199.851	3 708.502	6 208.081
Paper making	23 393.87	28 429.74	43 435.91	53 500.35	89 722.773	149 416.37
Printing and stationery	2 704.054	3 387.671	5 500.575	6 984.45	14 061.23	28 110.179
Medical industry	12 181.6	16 079.12	28 980.9	38 770.92	70 797.70	128 375.2
Rubber and plastic	5 124.432	5 889.322	8 047.153	9 373.493	12 610.27	16 846.003
Electronic devices	2 699.83	3 133.516	4 366.826	5 136.951	8 317.8408	13 374.15
Coal industry	22 684.93	29 684.59	52 585.14	69 742.1	11 696.53	194 776.93
Metal and non-metals industry	8 667.897	10 366.19	15 337.68	18 590.74	29 836.685	47 550.671
Wood industry	43 848.43	51 840.42	74 960.65	89 822.74	125 578.45	174 338.23
Timber and artificial board	21 223.83	24 633.33	34 328.62	40 382.5	51 106.347	64 225.195
Electricity	27 501.11	33 996.96	53 746.84	67 341	103 327.22	157 434.56
Petrochemical industry	24 633.12	30 886.19	45 611.81	55 233.62	77 220.578	107 203.64
Chemical fibres	19 842.74	24 836.64	40 254.19	51 067.09	78 356.687	103 662.97
Building materials	32 542.47	46 838	96 116.74	134 975.1	247 669.73	443 134.4
Metallurgy industry	6 116.032	7 376.816	11 102.54	13 572.63	21 976.984	35 386.667
Metal product processing	5 880.331	6 891.862	9 793.658	11 633.71	16 890.312	24 350.300
Machinery manufacturing	15 677.00	19 087.33	29 271.64	36 121.68	51 467.011	72 818.242
Transportation equipment manufacturing	3 377.548	4 611.920	8 895.688	12 311.13	22 480.707	40 763.562
Equipment repair industry	4 136.296	5 083.165	7 941.748	9 891.828	15 177.851	23 125.806
Total	334 812.87	422 635.93	698 245.56	898 498.25	1 490 799.1	2 479 615.5

Source: *Industry Development Strategy for Year 2000 in Yanbian Prefecture.*

Table A.3. Output value of different industrial sectors
(Tens of thousands of yuan renminbi in constant 1980 price)

Sector	*1992*	*1993*	*1995*	*1996*	*1998*	*2000*	*Growth rate (%)* *Eighth Five-Year Plan*	*Growth rate (%)* *Ninth Five-Year Plan*
Food processing	20 422.40	23 261.09	30 177.09	34 371.69	51 075.10	75 895.5	13.90	20.26
Beverage	12 204.09	14 461.79	20 307.69	24 064.59	41 234.19	70 654	18.50	28.32
Tobacco	46 717.10	57 555.39	87 359	107 626.2	162 827.7	246 342.2	23.20	23.04
Textile	12 288.5	12 165.59	11 923.5	11 804.29	13 514.70	15 473	-1.00	5.35
Sewing and leather	9 124.599	10 630.20	14 427.5	16 808.09	28 668.5	48 898	16.5	27.65
Furniture	1 828.699	1 978.599	2 316.399	2 506.399	3 332	4 429.6	8.20	13.84
Paper making	25 393.69	27 120.5	30 034.3	33 037.80	43 692.5	57 783.39	6.80	13.31
Printing and stationery	7 290.200	8 026.5	9 729.7	10 712.4	17 007	27 000.3	10.10	22.65
Medical industry	27 115.19	31 453.69	42 324.10	49 095.89	70 698.10	101 805.2	16.0	19.19
Rubber and plastic	10 412.20	10 516.29	10 727.70	10 835	11 494.79	12 194.79	1.00	2.60
Electronic devices	7 423.299	7 571.700	7 877.600	8 085.200	10 260.09	13 101.09	2.00	10.71
Coal industry	7 275.100	8 366.299	11 064.5	12 724.09	16 827.69	22 254.59	15.00	15.00
Metal and non-metals industry	5 553.899	5 837.200	6 447.799	6 776.600	8 576.599	10 854.79	5.10	10.98
Wood industry	33 823.5	35 142.60	37 937.19	39 416.80	43 457	47 911.30	3.90	4.78
Timber and artificial board	22 234.40	22 679.09	23 595.30	24 067.19	24 019.09	23 971.09	2.00	0.32
Electricity	14 924.4	16 213.90	19 136.69	2 079.09	25 156	30 438.80	8.64	9.73
Petrochemical industry	22 312	24 585.8	27 105.90	2 846.19	31 378.5	34 594.69	9.95	5.00
Chemical fibres	15 518.29	17 070.09	20 654.80	22 720.30	27 491.5	28 883.30	10.00	6.94
Building materials	29 913.40	37 836.80	57 967.10	70 582.89	102 133.5	145 121.4	28.20	20.15
Metallurgy industry	4 184.299	4 435.299	4 983.600	5 282.600	6 745.299	8 613.099	6.00	11.56
Metal product processing	10 488.09	10 802.70	11 460.59	11 804.40	13 514.90	15 473.20	3.00	6.19
Machinery manufacturing	24 334.80	26 038.19	29 811.19	31 898	35 840.5	40 270.39	7.00	6.20
Transportation equipment manufacturing	6 239.5	7 487.399	10 781.90	12 938.29	18 631.08	2 682.80	20.0	20.0
Equipment repair industry	9 991.400	10 790.70	12 586.29	13 593.20	16 447.69	19 901.80	8.00	9.60
Total/average	387 013.2	432 027.5	541 637.5	609 953.4	824 024.2	1 128 695	11.86	16.63

Source: Industral Development Strategy for Year 2000 in Yanbian Prefecture.

Table A.4. The structure of the major industrial sectors in Yanbian Prefecture

Sector	*Output value in 1990 (constant 1980 Y)*	*Share structure (%)*	*Growth rate 1986-1990*
Wood processing	31 332	8.80	2.54
Tobacco processing	30 779	8.64	32.28
Paper making	22 263	6.25	8.15
Handicrafts	21 371	6.00	13.95
Machinery	21 255	5.97	11.59
Medical	20 151	5.66	34.43
Building materials	16 741	4.70	14.14
Food manufacturing	15 742	4.42	9.85
Chemical fabric	12 825	3.60	5.46
Power	12 645	3.55	19.49
Textile	12 538	3.52	2.77
Chemicals	10 610	2.98	9.45
Metal products processing	9 886	2.77	19.94
Beverages	8 691	2.44	13.24
Plastic products	7 208	2.02	28.97
Petroleum processing	6 261	1.76	86.60
Coal	5 501	1.54	3.00
Sewing industry	5 319	1.49	16.31
Total	271 118	76.11	

Annex II

TRADITIONAL MEDICINE IN THE DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA AND CHINA

A. Traditional medicine in the Democratic People's Republic of Korea

Owing to its geographical diversity, the Democratic People's Republic of Korea has 1,200 species of medicinal plants growing in its mountain regions, plains, plateaux and in the seas. Many wild indigenous plants are very rich in natural resources. In addition, 100 kinds of medicinal plants are cultivated at 12 large state farms for medicinal plants and at some small cultivation stations. Three-hundred-thirty kinds of common crude drugs have been accepted by the country's official pharmacopoeia.

The Democratic People's Republic of Korea has a long history of extensive use of traditional medicines and a well-established national system for research and production of those medicines, which account for half of the medicines used clinically in the country. There are 203 pharmaceutical factories for traditional medicines, situated in Pyongyang and every other region. They produce about 230 kinds of traditional Korean medicine. Many different dosage forms (tablets, granules, teas, tinctures, mixtures, honey pills, *dan* (small pills), powders and injections etc.) are made.

Some medicines, for example, Korean ginseng and its products, are exported. Although many types of medicines are produced, most of the equipment is old and primitive and some of the processes need upgrading. The formulation of medicines need modernization. GMP is not in place in these factories.

There are many research institutions for traditional medicines in the Democratic People's Republic of Korea, such as the Korean Medical Academy of Sciences, the Research Institute for Natural Medicine, the Research Institute for Traditional Korean Medicine, Koryo Pharmaceutical University, Pyongyang Medical University and 14 other colleges of pharmacy or faculties of pharmaceutical sciences in medical universities. Much has already been learned about the chemical constituents and pharmacological activity of commonly used crude drugs. The study on P-polysaccharide prepared from peat has achieved good results and the technique has already been applied in the industrial production of P-polysaccharide injections. Studies on *Lycoris* elucidated the anti-infantile-paralysis effects of dihydrogalanthamine, which was proven to be 10 times stronger than galanthamine. Some marine and animal products were also studied. Civetta injections made of animal products were also studied. The civetta injection made of animal drug civetta was successfully researched and developed and is now used for the treatment of cerebral thrombosis and sequelae of cerebral haemorrhage.

1. Development of the ginseng industry

A full and steady supply of ginseng raw material and a strong international market are the main reasons for developing the ginseng industry at Sonbong Pharmaceutical Factory. Development is ongoing in a number of fields:

Ginseng raw material base

There are two raw material bases for cultivating ginseng in this country: one is in the Kaesong area, another is in the Rajin-Sonbong area, where 100 hectares of land are under Korean ginseng cultivation. To meet WHO standards, a big effort should be made to reduce the agrochemical residues in ginseng by cultivating it without, for instance, pesticides.

Modernization of processing for Korean red ginseng

Korean red ginseng is well known in the international market, especially in Hong Kong and China. The processing technology is good, but the equipment is primitive and must be modernized to obtain higher quality products.

Establishment of a workshop for the production of standardized ginseng extract and its preparations

Ginseng products are available everywhere, but the markets are not as strong as they could be because of low quality. The Pharmaton Company at Lugano, Switzerland, researched and developed the technology for producing standardized ginseng extract and its preparations and a series of methods for quality control. Pharmaton's Ginsana capsule has sales of US$ 110 million in Europe and US$ 58 million in the United States. This is due to the high quality of the standardized extract and its preparations. Based on Pharmaton's experience, Sonbong Pharmaceutical Factory should also establish a workshop for the production of standardized Korean red ginseng extract and its preparations. The key point here is that Korean red ginseng is different from the common ginseng used by Pharmaton, which would give the Sonbong Pharmaceutical Factory product a competitive edge.

The introduction of advanced technology and modern equipment is essential. The technology should ensure that the standardized Korean red ginseng extract and its preparations contain a certain percentage of ginsenosides and no heavy metals or agrochemical residues. The raw materials, intermediates and finished products should be controlled by advanced methods and instruments. Standardized teas and capsules should be formulated in this facility.

2. Modernization of the biopharmaceutical industry

Sonbong Pharmaceutical Factory has the second largest technological base and production capacity for biological preparations, but the equipment is old and the technology is primitive. Advanced technology and modern equipment must therefore be introduced.

In the long term, Sonbong Pharmaceutical Factory should introduce modern biotechnology, including the engineering of enzymes, genes, cells and so on to produce advanced biopharmaceutical products, such as tumour necrosis factor, human growth factor and interferon to meet the health care demands of the country's people in the twenty-first century.

3. Establishment of a starfish medicine base

The Rajin-Sonbong area borders the Sea of Japan, which is rich in starfish. The medicine *Sambali*, made from starfish, is exported to the Inner Mongolia autonomous region of China for the treatment of stomach ulcers and backache. Thus, it is recommended to establish a starfish medicine base at the Sonbong Pharmaceutical Factory or elsewhere in the Zone.

4. Action plans

Table A.5 shows action plans for the Sonbong Pharmaceutical Factory.

Table A.5. Action plans for the Sonbong Pharmaceutical Factory

Project name	*First stage (by 2000)*	*Prospective stage (by 2010)*
Dioscorea industry	Expansion and modernization of existing production capacity, with a planned annual output, 20 tonnes of diosgenin. Introduction of new equipment and technology by establishment of a joint venture company.	Establishment of a steroid hormone medicine industry. Manufacture of hormone preparations, meet GMP requirements; a joint venture company is expected.
Ginseng industry	Introduction of new technology and advanced equipment.	Production of standardized ginseng extract and its preparations.
	Processing of high quality red ginseng.	Establishment of an advanced ginseng industry according to GMP requirements.
Biopharmaceutical industry	Expansion and modernization of the factory to meet GMP standards by formation of a joint venture company.	Introduction of modern biotechniques to produce most advanced biopharmaceuticals such as interferon and human growth factor.
Marine medicines and other traditional Korean medicines	Expansion and modernization of marine medicine production, including *sambali* and blood substitute.	Expansion and modernization of the industry for other traditional Korean medicines (Rajin Pharmaceutical Factory)

B. Traditional medicines in China

China has 6,000 species of medicinal plants growing wild in different regions. More than 900 kinds of commonly used plant-based medicines have been accepted by China's official pharmacopoeia.

China has a three-thousand-year history of the extensive use of traditional medicines. There are 1,500 pharmaceutical factories producing more than 6,000 kinds of traditional Chinese medicines, which account for 30 per cent of the medicines used clinically in China. Traditional Chinese medicines are not only used in China but are also exported to Japan, South-East Asia, the United States and some other countries.

There are 23 colleges or universities that specialize in training doctors and pharmacists in traditional Chinese medicine. Every province and city has at least one hospital that uses traditional Chinese medicine.

Many research institutes for traditional Chinese medicine have been established in Beijing (for instance, the China Academy of Traditional Medicine) and in each provincial capital. A lot of research and development on new plant-based drugs is carried out in these institutes. Many achievements were obtained in the field of traditional Chinese medicine. One example is artemisinin, a novel anti-malarial prepared from the herb *Artemisia annua*. Now the Chinese Government pays more attention to developing and modernizing traditional Chinese medicine industries than it did before, and they have a very bright future.

1. Priority projects for further development

Of the 23 projects that were selected by Yanbian Prefecture authorities, four can be considered priority projects:

- *Guyang granules (anti-cancer, immunostimulant drug).* Guyang granules (GG) are manufactured in Yanji Second Pharmaceutical Factory (YSonbong Pharmaceutical Factory). GG was given priority because the raw materials, including ginseng, are abundant in this area. GG, as a new drug, has been approved by the Ministry of Public Health, and a production licence ([95] Medicine Certificate Z-44) was given to YSonbong Pharmaceutical Factory. Patent number CN 1095617A was awarded to YSonbong Pharmaceutical Factory for the technology for producing this product. The factory has the necessary equipment and instruments for production and quality control. Also, GG has special therapeutical efficacy, so the market for it in China is estimated to be 36 million bags per year. The output value is about Y 40 million per year, of which Y 8 million is profit.

- *Traditional Chinese medicine for apoplexy.* Five types of pills and capsules for the treatment of apoplexy, including brain thrombosises and cerebral haemorrhages, were researched and developed in Dunhua Pharmaceutical Factory in collaboration with the Beijing University of Traditional Chinese Medicines. This project was given priority because of the steady supply of raw materials and the availability of advanced technologies and equipment at DPF. Also, apoplexy is a difficult disease, and no good Western medicine is available to treat it, so the market outlook for the medicines in China is very good.

- *Dioscorea industry.* The dioscorea industry entails the industrial processing of the medicinal plant *Dioscorea nipponica*, which grows in abundance in the Changbai mountain area. The industry extracts diosgenin from the plant and manufactures hydrocortisone by using diosgenin. This production can be conducted in the Hunchun Pharmaceutical Factory. The project was given priority for the following reasons: abundance of the raw material in the Changbai mountain area (estimated at 300,000 tonnes in the Yanbian Prefecture area), the strong market and big benefit. Diosgenin has a very strong demand in China, because three big pharmaceutical companies (one each in Shanghai, Tianjin and Shenyang) require at least 480 tonnes of it a year.

- *Ginseng industry.* The aim of this project is the development and production of high quality standardized ginseng extract and its formulations using the ginseng natural resource. The project was given priority for a number of reasons, one of which is the abundance of raw material, which is much more than enough for industrial processing needs (the volume of ginseng grown in Antu County is about 180 tonnes a year; 90 per cent of the commercial ginseng in the world is from the Changbai mountain area, which covers the northern part of the Democratic People's Republic of Korea, far eastern Russia and the north-east of China). Also, standardized ginseng extract and its formulation can be expected to have a better market in China and South-East Asia than common ginseng products. Antu Pharmaceutical Factory has produced ginseng products for 26 years and has the necessary equipment for production and quality control. The ginseng products of ATPF are well known in China and other countries. In recent years, however, the market has become saturated by similar products. Now ATPF is determined to develop standardized ginseng extract and its formulations and hopes to establish a joint venture company with foreign investors.

2. Action plans

Table A. 6 sets forth action plans for the development of traditional Chinese medicine in Yanbian Prefecture.

Table A.6. Action plans

Project name	*First stage (by 2000)*	*Second stage (by 2010)*
Guyang granules	Establishment of modern workshop in YSonbong Pharmaceutical Factory for the production of Guyang granules by attracting foreign investment. Development of domestic markets.	All parts of YSonbong Pharmaceutical Factory realize GMP standard. Quality control reaches international level. Development of international markets.
Traditional Chinese medicines for apoplexy	DPF reaches GMP standard. Production of high quality apoplexy medicine by a joint venture company. Development of the domestic markets.	Quality control reaches international level. Development of international markets. R and D on new traditional Chinese medicines.
Dioscorea industry	Large-scale production of diosgenin in HPF and YPF; output reaches 60 tonnes. Establishment of a joint venture company in HPF for the production of hydrocortisone.	HPF realizes GMP standard and produces more hormone medicines. Development of international markets.
Ginseng industry	R and D on new, high-quality standardized ginseng extract and its formulations. Establishment of a joint venture company for producing ginseng standardized products.	Large-scale production of high-quality standardized ginseng extract and formulations. R and D on new standardized products.
Other traditional Chinese medicine industries	Improvement of technologies and equipment. Enhancement of product quality. APC reaches GMP standard. R and D on ca. 12 new traditional Chinese medicine products.	All traditional Chinese medicine industries reach GMP standard. Quality control meets inter-national level. Development of international markets for high-quality traditional Chinese medicines. Further strengthening of R and D capability in traditional Chinese medicine industries. R and D on 10 kinds of high-grade traditional Chinese medicines.

Annex III

THE GARMENT SECTOR IN THE PRIMORSKIY KRAY

A. Developments since 1985

The ambitious plan of the former USSR to develop consumer goods production and consumer services, which envisaged increasing production from 12.1 billion metres of cloth in 1985 to 14.0-15.0 billion metres in 1990, was never realized. The shortfall of investments, owing to various political and economical factors, obliged officials to scale back their forecasts. Only the production budget has been established allowing manufacturing clothes for local market.

The last investments in the Primorskiy Kray took place in 1985, when some old equipment (from first-generation facilities erected in the 1970s) was replaced and the existing production capabilities were refreshed.

Many plans for the restructuring and revamping of existing facilities have been prepared as well as plans for increasing production for export. On the eve of perestroika, some regional and central officials were certain that many of the facilities were at the end of their useful life and that perestroika would allow them to push ahead and start restructuring the sector.

Since perestroika began, managers have faced the dichotomy between existing economic legislation, which imposed rigorous planning, management and financial methods and the new way of working under perestroika, which encourages new initiatives and improvements. This huge contradiction and double standard led to immobilism and the inability to make decisions. The fear of action by the central authorities to punish violations of the existing laws reinforced this status quo.

When the laws were liberalized in 1991 and 1992, and before privatization started in 1993, some plants tried to restructure facilities but with little hope of success.

B. Scenarios and action plans

Three scenarios should be considered:

- Reorganization of all large enterprises into subcontracting enterprises, with the aim of assembling garments in the medium and high price ranges for export and for regional sales. The low wages in China and the Democratic People's Republic of Korea will remain a major obstacle for the Kray in restructuring its garment sector to produce low price garments.

- Exploring all opportunities for partnerships with Japanese and American markets with the aim of attracting production to the Kray. The Kray could share this market with enterprises in the Republic of Korea for medium- and high-quality products by providing high value added. Reconquering the Russian Federation market should be the next objective after satisfying export needs.

- Developing a new high-style range of products by creating small, flexible enterprises and using the abilities of local designers. The Nakhodka Free Economic Zone should take leadership in the region for improving the investment climate in the export segment of the garment sector, as mentioned in their brochure.

A number of action plans have been proposed/are recommended.

1. Promotion of new adapted structures

New, small, flexible enterprises with new names and structures should be created. The start-up enterprises using advanced technologies, should be supported by regional and central authorities for a limited time (3-5 years) giving them real financial incentives: (a) exemption from or at least a reduction of taxes if profits are reinvested in the enterprise; (b) reduction of import duties for all new and updated production equipment (tools, cars, computers, automation systems); (c) extension (for 3-5 years) of the free economic zone policy to all new and existing enterprises in the garment sector in all parts of the Primorskiy Kray.

2. Support for existing enterprises

The large existing enterprises and structures should be audited by international auditors to assess their viability. Annual analysis and control of all enterprises in the sector with scoring methods to be devised by professionals would prevent non-reversible situations from developing and would identify vulnerabilities for each enterprise. All annual subsidies should be subjected to analysis and follow the scoring method under the following categories: management of structural costs, management of commercial task force and management of price.

3. Financing of new equipment and reinforcement of human resources

New high technology equipment and management tools should be purchased: computer-aided design, cutting and sewing and integrated systems for the management of stocks, accounting and inventory. There should also be programmes in creativity and new fashion development, training in new technologies, human resource management programmes and incentives programmes. All work spaces (even if no new technologies or equipment are introduced) should be re-engineered to suit the new subcontracting functionality of the existing facilities. This would greatly increase productivity.

4. Development of international marketing

Contacts with international professional groups should be promoted to attract joint ventures to the Kray with international registered brand names on a licence basis. Administrative procedures should be adopted and a garment and textile professional syndicate should be set up for all existing and future enterprises in the sector. The procedures and administrative formalities for creating new enterprises should be reduced to a minimum and a legal structure for subcontracting enterprises and part-time and temporary work should be developed.

5. Training programmes

The synergy between industrial enterprises and technological and economic institutions in the far east of the Russian Federation should be increased and all management, commercial and marketing workforces should be trained to satisfy operational needs and to develop worldwide competition strategies. A comprehensive database should be elaborated and information materials containing such data should be published and made available for all international and local investors and customers. There should be participation in major international professional forums, and exhibitions presenting new strategies and trends in the sector should be set up. The positive image of the garment sector in the Kray should be promoted, studies should be published in leading international professional publications and professional directories should be subscribed to.

Annex IV

INTERNATIONAL TRENDS IN THE CLOTHING SECTOR

Table A.7 shows international trends of the clothing sector in industrialized countries.

Table A.7. Growth of world market for textiles and clothing

	Total consumption (billion US$) (1989)	*Consumption per capita (US$) (1989)*	*Annual growth rate (%)[a]*	
			1977-1989	*1989-1995*
European Union	246	756	+ 1.2	+ 1.2
United States	241	977	+ 4.3	+ 2.2
Japan	108	888	+ 1.2	+ 1.5

Source: CTCOE.

[a]In local currencies.

The clear subsidence in the United States market is reflected in the stabilization in the European market and the very low growth in the Japanese market. Two main characteristics determine the magnitude of the world clothing market:

- The overall economic outlook (with a low growth rate from the 1990s).
- The proportion of the family budget spent on clothing, which is declining (see table A.8).

Table A.8. Changing share of the clothing budget in the total family budget
(Percentage)

	1977	*1989*	*1995 (estimate)*
European Union (12)	6.8	6.1	5.9
United States	5.5	4.9	4.9
Japan	5.5	4.8	4.1

Source: CTCOE.

From a qualitative point of view (definition of products, markets, population needs), two main markets have emerged during the last 20 years:

- Basic clothing (convenience and daily wear), which is typified by jogging outfits, pants and pullovers.
- Sophisticated clothing, which reflects lifestyle, welfare, social status and personal identity.

The value added for the second market is higher:

	Basic clothing	*Sophisticated clothing*
Function	General uses	Social symbol
Range of offerings	Standard	Differentiated
Demand	Large volume	Fragmented
Price elasticity	High	Low
Basis of competitiveness	Price	Overall quality

This duality of products and markets leads to complexities and volatility, making it difficult to arrive at a prognosis for the sector.

Table A.9 shows different levels of industrialization in various countries involved in the textile and garment sector.

Table A.9. Countries/areas involved at various levels of the textile and garment sector

Industrialization level	*Example of country/area involved at the level described*
Partial processing of raw materials (cotton) in rural areas	Africa, Sudan
Assembly of garments destined for export	Bangladesh, Sri Lanka, Maurice Island, Tunisia
Initial stages of a combined textile-garment sector	China, Indonesia, Malaysia, Thailand, Turkey
Completed combined textile-garment processing sector (growing)	Hong Kong, Republic of South Korea, Taiwan Province of China
Stabilized combined sector (already in decline or delocalized)	United States, Italy, Japan
Distribution and commercial activities and services	Netherlands

The industrialized countries have invested huge sums to design integrated process plants in the garment sector that optimize output and minimize workforce costs. The total quality method is integrated into these system designs. Equipment is available from the following entities: in Japan, from Brother, Juki, Mitsubishi and Ashai; in Germany, from Pfaff, Adler and Durkopp; in Italy, from Rimoldi, Macpi and Necchi and in the United States, from Drapper, Gerber and IBM.

Annex V

DEVELOPMENT OF FISH PROCESSING IN THE PRIMORSKIY KRAY AND ACTION PLANS FOR THE FUTURE

The fishing sector was formerly regulated and sustained by the Ministry of Fishing, which defined all objectives and strategies. The Ministry ran a military-type organization, with rigorous plans defining all priorities, investments and other related subjects. In 1989 it allocated R 3 billion for fleet development and industrial equipment. At that time, all the associated sectors (rail transport, navigation tools etc.) were also supported by the State budget.

Since the beginning of the political changes and the onset of privatization in 1992, all subsidies have been stopped. The private sector must be autonomous and directly bear all financial responsibilities, for operational expenses as well as investment expenses. These structural modifications were made without any preparation or assistance. Production output has suffered and profits have diminished.

A number of action plans are recommended:

- *Technical and financial support to existing enterprises.* Qualified teams should study markets, and products to determine local demand and the possibility of exportation, optimal production levels, manufacturing norms, taking the specifics of the Primorskiy Kray market into account and its almost total dependence on imported raw materials. Existing technical, human and financial resources should be evaluated, the productivity potential of each facility determined and a modernizing programme prepared. The purchase of new equipment for packaging and processing should be supported with short-term loans at favourable rates. Standards of packaging, storage, processing hygiene and product quality should be made to conform with international standards.

- *Reinvigorating the local market.* Development and modernization of commercial structures for selling food products should be supported by partial exemption from taxes.

- *Training.* Establish training programmes in management, commercialization and marketing for the executive staff of existing firms to prepare them for new production techniques, new products, new methods of management that are being applied worldwide in the foodstuffs sector. Adapt the training programme to the education and background of those responsible in quality control and marketing (definition and sales of products). Link technical institutes and universities to training.

Annex VI

THE SHIP REPAIR AND SHIPBUILDING SECTOR IN PRIMORKSIY KRAY

A. Development projects

The following projects are mentioned in official promotional materials distributed by the regional administration. They are mentioned only briefly, and no further details have been given:

Project	*Location*	*Cost*	*Production capacity*
Renovation of Vostochniy port	Nakhodka	R 400 billion	20 million tonnes/yr
Renovation of glove factory	Nakhodka	US$ 400 million	4 million pairs/yr
Development of facilities for making oceanographic instruments	Vladivostok		
Construction of a fish market using Japanese refrigeration equipment	Nakhodka		

B. Factors affecting the development of ship repair and shipbuilding

1. Ship repair

Ship repair is a competitive international business carried out on the basis of United States dollars, with price of prime significance. The ship repair market depends on many factors. Demand is increased by the ageing of fleets, environmental considerations (oil spills etc.), safety of life at sea, classification rules and the great expense of building new vessels. It is reduced by weak freight rates and the low value of second-hand vessels. The regional distribution of ship repair will be determined by comparative advantages in location, price, docking capacity and quality of work.

For a ship repair yard, the most important assets are the workforce and the dock facilities. The most critical issue is the cost of the labour, which generally accounts for 55-70 per cent of the total cost, and its productivity. Ship repair jobs have increased remarkably in low labour cost countries, where the wages of workers are 20 per cent or substantially less than those in industrialized countries. Ship repair price offers are usually quoted in United States dollars, so the exchange rate also has crucial influence on price. The Japanese shipbuilding industry has suffered greatly from the appreciation of Japanese yen to the United States dollar since the second half of the 1980, and has lost a large part of its market share.

From the viewpoint of price, quality and docking period, the shipyards of Singapore, the Republic of Korea and China are the most competitive in the international market.

Demand for ship repair in terms of gross tonnage has been estimated, on the basis of existing volume and average age of the world's merchant fleet, to be about 10 per cent per year.

2. Shipbuilding

Shipbuilding is also an international business and has to face free competition on a United States dollar basis. Demand for new ships is decided by the fleet capacity required to meet the growth in cargo volume and the scrappage rate of ships that were in need to be replaced.

Many shipyards bid for the same project, and, as in ship repair, the quotes are in United States dollars.

The most crucial issues in shipbuilding are the technical capabilities and ability to meet the quality requirements of the market. In addition, comparative advantages in the cost of material and equipment, which generally account for about 80 per cent of the total cost, and in the productivity of the labour are important. The price for building new ships in the world market fluctuates widely depending on the supply and demand. The profit or loss of the company will depend on the contract price, so it is very important for a shipbuilder to contract new ships in good market condition.

3. Success factors

For long-term success, it is vital for an enterprise to remain profitable and competitive in a market-oriented economy. The market in this sector is international, as mentioned earlier, so how to maintain competitiveness is a crucial consideration. There are two major categories of competitiveness: price-competitiveness and non-price competitiveness. Both in the Primorskiy Kray and abroad, where there are similar competitors, prices are determined by two factors: demand/supply and competition among enterprises in the same business.

The main difference between a socialist economy and a market-oriented economy is the existence of free competition. Where there is a positive rivalry, shipyards can play a role in developing the shipbuilding industry.

Data for the first half of the 1990s are shown in table A.10.

Table A.10. Output value (current prices), number of employees and average salaries in the shipbuilding and ship repair industry

	1990	*1991*	*1992*	*1993*	*1994*	*1995*[a]
Output value (million R)	496	843	6 945	69 248	171 553	237 493
No. of employees)	32 601	31 580	28 830	25 428	21 648	16 765
Average salary[b] (R/month)	363	667	7 355	84 305	324 152	--

[a]First nine months.
[b]Taken from industry action plans.

C. Programmes and action plans

1. Policy

Policy should address the following aspects of sectoral development:

- The status and mission of the sector as well as the measures and goals of development.
- Intended reforms of the legal framework.
- Cooperation between the Government and private enterprises in the sector.
- Steps for upgrading the facilities.
- Modernization and improvement of education and training.
- Facilities to encourage the flow of investment.

2. Development task force

The Government should organize a task force to encourage the implementation of policy. The members would consist of experts, from the Vladivostok University, the Polytechnic Institute and the Far Eastern Scientific Research Institute for the Sea Fleet, as well as representatives of the private sector.

The task force would have two committees:

- The technical development committee would be responsible for optimizing use of existing facilities, diversifying products and services, improving productivity, industrial management and techniques, meeting international standards, introducing computer applications and training and upgrading facilities and the education system.
- The business development committee would be responsible for financial practices and development, international rules of accounting and auditing, modernizing the management and operation system, computer applications, reorganizing existing enterprises and entering the international market.

3. Financing

A scheme to finance the sector, along with the maritime and fishery sectors should be set up. Because there is no stable financing system and interest rates on loans are so high, all privatized industries have stagnated.

Reasonable interest rates and a workable financing system are imperative. Some recommended measures are as follows:

- Legislation to establish a maritime credit corporation law would promote building of replacement vessel for the worn-out passenger boats and old coastal cargo ships, ensuring safety at sea and reducing operating costs.

- A loan system such as a credit fishery federation or a fishermen's cooperative association would make it easy for small fishing-related firms to borrow money to improve their business, including the building of new ships.

- A loan system set up by a cooperative association of the Kray's shipyards would make it easy for shipyards to borrow money to upgrade facilities and cutting and welding equipment and tools to improve quality and productivity.

4. Education and training

To raise the educational level of engineers and to improve the skills of workers it is recommended that engineers and workers be sent to advanced countries, and that experts from advanced countries be engaged. The Kray should learn from the experience of other countries such as China, Singapore, the Republic of Korea and Japan, which have developed their shipbuilding industries. Furthermore, it is worthwhile considering the establishment of vocational centres to teach advanced techniques.

5. Managerial and technical requirements

To increase productivity in a manufacturing enterprise, the workload must be sufficient. In addition, management must learn the following:

- To master the process of preparing corporate strategies and medium- and long-term plans, including marketing planning.

- To improve the decision-making process and delegating power and responsibility.

- To promote sales and to set prices based on marketing planning.

- To gather financial data and carry out cost accounting, balance sheets and business rules that conform to international standards

- To master cost control systems, from itemized cost estimation and budget allocation through monitoring costs.

- To improve the procurement system control of materials.

Capacity can be raised and productivity enhanced by better management of human resources and physical facilities, with only minimal investment. Some measures are as follows:

- Build up the design capabilities, which affect cost and quality.

- Prepare standards for design, working procedures and quality based on international rules and regulations.

- Prepare plans for upgrading and maintaining facilities and equipment.

- Upgrade the production process, the technical level of welding, cutting, bending steels and the application of computerized systems.

- Training of workers in many skills, engage some of them on a temporary basis and encourage subcontracting.

6. Diversification of products and services

The shipyards of the sector should diversify their products and services by branching out to other activities using the technology acquired in shipbuilding and ship repair. Prior to planning the marketing, a marketing audit should be carried out with the help of consultants. Such an audit comprises three steps:

- Gathering the relevant information about the external environment and the organization's internal resources.
- Identifying the organization's internal strengths and weaknesses, especially in relation to external market opportunities and competitive threats.
- Making assumptions about the future.

The shipyards of the Kray have the potential to enter a number of new markets. They should, however, first seek assistance from an industrialized country or consultants in the market planning, evaluation, analysis and development of a business plan:

- Small- and medium-sized commercial vessels of various kinds, including passenger ships, specialized work vessels, high-speed boats and offshore steel structures.
- Steel structures, steel bridges, fishery-related facilities and storage tanks for crude oil and liquefied petroleum gas.
- Casting of ship parts, such as stern frames, rudder horns and anchors, as well as valve wheels for trains and cranes and parts for other machinery and equipment.
- Deck machinery such as windlasses, cargo winches, mooring winches, various kinds of cranes and materials handling machines.
- Engineering and building plants, heat exchangers, boilers and pressure vessels.
- Marine diesel engines and diesel power plants.
- Waste treatment systems (incineration, shredding, resource recycling, waste water and SO_x and NO_x exhaust gases).
- Gas turbine co-generation systems, steam turbines.

7. Entering new markets

Entry into new markets requires design and construction process know-how to meet the requirements of the potential client as well as a knowledge of the rules and regulations of industries involved. Both the shipyards and Government should realize that they need to modernize their equipment and techniques.

The main requirements of clients are as follows:

- Reliable, on-time production system and guarantee of delivery as scheduled.
- Capacities to make the desired products.

- Reasonable cost and good performance.
- Guaranteed quality.
- Willingness to manufacture a wide range of products.
- Ease of contact and prompt, client-oriented quotations.
- Facilities and yard capabilities that meet safety standards and applicable international standards.

This strategy requires that production should be unified, which in turn will mean downsizing the shops and factories of each shipyard. A joint venture company should be established to produce the selected products.

In the Kray, the sector has been facing increasing difficulties, which reflect the negative growth of gross national product and of employment and output in the sector.*

8. Action plans

Short term

Management and technology must be strengthened as follows:

- *Management training programme*. Because of the highly centralized process of decision-making in a socialist economy and lack of experience in free competitive markets, the managers of the sector find it difficult to take responsibility for the decisions they make, and their commercial management skills need urgently to be developed by an overseas master course in management, finance and economics. In line with this, scholarships in advanced countries are recommended for management training for selected junior and senior managers of privatized companies and government personnel and for technical management training for selected engineers and technical staff. Training in marketing, sales and basic design is to be done in cooperation with an advanced industrial corporation or a consultant, because it is an urgent matter to build these capabilities, which need a long time to master.
- *Technical education and training programme*. This programme would include upgrading the welding and fabrication skills of workers in the shops of selected shipyards by engaging experts from advanced shipbuilding countries, dispatching engineers and senior workers to advanced shipbuilding countries and providing training in protecting the environment from industrial pollution.

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*In connection with this, it is worth mentioning the negative opinions and skepticism that have been heard from both administrators and business people in the sector. They do not think that they will derive benefits from TRADP. They need soft loans and foreign investment instead. TREDA and the development authorities of the Kray have an interest in attracting traffic and foreign investment and are competing with each other. This negative outlook should be changed and a more positive attitude towards TRADP encouraged. Although competition obviously exists between the Kray and the TREDA countries in traffic and foreign investment, as it does in other developing countries, the role and functions of the two are distinct: the Kray is already a centre of industrial engineering, high technology and advanced human resources and the TREDA regions are just starting their economic development.

- *Optimization of capacity utilization and improvement of productivity.* This study is to be done in cooperation with advanced industrial corporations or consultants. It will consist of studies on reforming the companies and organizations, diversifying products and services, performing market analysis and planning and financial analysis, assessing existing technologies, analysing manpower and the business environment, and making recommendations on an implementation plan, finance, organization, management systems, technical cooperation, cost and budget control, employee training, quality control etc.

- *Industrial fund for promotion of the sector.* To promote and activate industries in the sector, soft loans are urgently needed. Such loans would be used for the upgrading facilities of the shipyard and the diversification of products and services. They would also be used to set up a fund to support enterprises that lacked capital. Financial assistance from foreign countries will be needed for this.

Medium term

In the medium term, two measures are needed:

- *Establishment of a fund for the promotion of the maritime industry sector.* This fund would encourage the replacement of old passenger boats and cargo ships and would reinvigorate the local shipping industry by introducing soft loans.

- *Vocational training schools.* To improve competitiveness and to meet the demand for a skilled workforce, existing vocational training schools should be reformed and expanded and their training facilities upgraded and modernized. Vocational schools for advanced technology should be established.

Long term

Over the long term, two additional measures are required:

- *Reform of the institutional framework of commercial and industrial systems.* In the course of reforming the economy, confusing aspects of the institutional framework must be sorted out, as foreign investors who do not understand the system hesitate to invest. In particular, the taxation system, the banking system, commercial regulations, currency exchange controls and the capital market system, must be reformed to conform with international standards.

- *Investment in plant.* Most of the shipyards have serviceable but outdated machine tools and equipment. Steel assembly shops and machinery shops should be rearranged and equipped with modern cranes, machines, welding tools, cutting equipment and robots to allow them to diversify their products and services. Such an investment would also enable the shipyards to reduce man-hours and to improve quality and productivity.

9. Management training courses in Japan

Table A.11 lists courses that are planned to take place in Japan.

Table A.11. Management training courses in Japan

Title of course	*Duration*	*Outline of activities*	*Subject matter*
Top Management Seminar on Japanese Business (TOPS)	1 week	Participants will exchange views and experiences with top Japanese executives and eminent scholars on selected managerial topics to enhance their ability to develop a corporate philosophy and strategy as well as make business decisions.	Management philosophy and strategy, features of Japanese economy and industrial relations, technological innovation and business strategy, discussions with top Japanese execu-tives.
Executive Programme on Corporate Management (EPCM)	2 weeks	Participants will review basic functions in corporate management such as production, marketing, financing and personnel management through exposure to Japanese experiences. They will also study the human aspects of corporate management such as motivation and leadership.	Human resource development, strategic management perspective, management strategy, marketing strategy, TQC and management, group discussions, case studies.
Executive Seminar on Total Quality Management (ETQM)	10 days	Participants will study the innovative TQM activities in Japanese companies through practical lectures and case studies. This will provide them with some ideas for building up a new management system for their companies/organizations.	TQM and its effects, management by quality, basic problems of quality improvement, QC activity, management srategy, management by policy, quality diagnosis and role of executives, human resource development in TQM, ISO 9000.
Corporate Management Programme for China (CHMP)	2 weeks	Participants will study the basic concept of corporate management such as corporate strategy, revitalization of an organization and the introduction of foreign capital through lectures, discussions and plant visits. Finally, they will study the role of top executives in an organization.	Corporate management, industrial structure in Japan, structure of distribution industries, characteristics of the consumption market, trading systems, new product development and sales strategies.
Programme for Cross-Cultural Management (PPCM)	3 weeks	Participants from various countries with different cultural backgrounds will compare the Japanese management system with their own to develop new management styles. The programme includes lectures, case studies, exercises and discussions with faculty members and co-participants.	Quality of organization, solving problems in cross-cultural management, internationalization of Japanese management, behaviour modelling for productivity, management by objectives, career development.
Training Course on Solving Human and Organizational Problems (SHOP)	3 weeks	Participants will study the human aspects of organizational problems in view of the importance of the human factor in an organization's management. Special emphasis is placed on exercises and classroom discussions to solve problems in the areas of leadership and motivation.	Personnel management, human aspects of organizational problem-solving, features of Japanese industrial relations, development, in-house training and education.

Title of course	*Duration*	*Outline of activities*	*Subject matter*
Programme for Quality Management (PQM)	3 weeks	Participants will study the basic concept of quality control and its application in industry through lectures, classroom discussions and plant visits. They will study how to implement company-wide quality improvement activities.	Concept of quality management, industrial relations, quality assurance, fundamental QC techniques, quality management, case studies, QC activity, TQC and management, human aspects of QC.
Programme for Quality Management (QCTC)	6 weeks	Participants will study fundamental statistical QC techniques through lectures, classroom discussions and in-plant exercises. They will study how to apply QC techniques at actual production sites to eliminate faults in the process and manufacture better quality products.	Concept of QC, fundamental QC techniques, quality assurance, process control and improvement, QC activities, in-company standardization, human aspects of QC.
Programme for Innovative Operations Management (PIOM)	4 weeks	Participants will study Japanese techniques for controlling factory activities so that participants will play an innovative role in improving their operations and be able to work in a competitive market.	Just-in-time cost management, industrial engineering, TQC concept, quality assurance, corporate strategy, case studies, in-plant training.
Production Management Training Course (PMTC)	6 weeks	Participants will review the whole process of production from planning to delivery, through lectures, production simulation exercises and plant visits. They will study how to increase total production efficiency in factories.	Corporate activities and functions, system function flow diagrams, factory management, production planning and control, just-in-time management.
Practical Improvement Programme for Factories (PIPF)	4 weeks	Participants will study such techniques and 5S, production-line improvement methods, industrial engi-neering and QC through case studies and in-company training so that they can solve various problems in a factory.	Concepts of TQC, TPM, %S, just-in-time, line balance, IE, QC techniques, in-plant training, report presentation.
Programme on Industry and Environmental Protection	2 weeks	Lectures and discussions on the performance of Japanese companies as well as visits to successful model companies will broaden the outlook and deepen the understanding of the participants and assist them in improving their environmental protection systems.	Environmental protection in Japan, specific environmental protection measures.