

APPENDIX B

PROJECT PROFILES

PROJECT PROFILE -1

"UPGRADING MEAT PROCESSING FACILITIES"

1. The Project

This project will upgrade and rationalize the operations of slaughterhouses owned by local governments: 13 by Municipalities; and 42 by Sanitary District Administrations in the Study Area in 1992. All small farms who grow pigs and cattle depend on these facilities as the first stage in the marketing chain. The rationalization of the marketing for meat is critical not only for the development of red meat industry, but also of dairy enterprise: they produce not only milk but also males calves for beef which could be a substantial part of income of dairy enterprises.

2. Project Rationale

The Master Plan calls for diversification of agricultural output with less reliance on rice and cassava. Feed grain and forage production can play a key role in the diversification.

The region also possesses a strong comparative advantage in livestock farming. This will raise farm incomes and reduce seasonal unemployment. It will also have a beneficial impact on foreign trade balance of the country by substituting for imported milk and high quality beef.

The development of dairy and beef industry depends on improvements in productivity and marketing system. The pig industry is relatively well developed, and most of the national output originate from large integrated operations. In the case of cattle, the productivity requires action on four components: breed improvement, animal nutrition, veterinary care, and husbandry practices.

The farmers will not undertake these actions if the improved productivity does not translate into profitability at farm level. This, in turn, depends on marketing and prices received by farmers.

In the case of marketing, the first step in the chain is blocked by the government through its monopoly on slaughterhouses. This effects small beef as well as pig farmers. It also equally effects dairy farms.

Although the government monopoly is supposedly terminated, there is no private sector interest in building these facilities. The existing four modern plants in Bangkok and the new ones eligible for BOI incentives is not a solution in the foreseeable future. The four modern enterprises produce whole carcasses for their own processing only.

The bulk of consumption relies on fresh markets which need to receive whole carcasses. These are supplied only from the public facilities or illegal slaughters.

The development of a service that will process the live animals into carcasses for marketing through the fresh market is not eligible for BOI incentives as BOI requires further processing. The change of these requirements will not be a solution either.

The enterprises undertaking this function commercially will compete with publicly owned facilities. The fees charged by these facilities are so low that they can not provide a sufficient revenue base for a commercial operation as shown below.

Three separate charges are levied on the uses of communal facilities. As of February 1993, these were as follows:

	<u>Tax</u>	<u>Service fee</u>	<u>Fee for use of stock holding area</u>	<u>Total charges</u>
	(..... Baht per Head)			
Cattle	12	12	3	27
Buffalo	15	15	3	33
Swine	10	15	3	28
Sheep and goat	4	4	3	11
Chicken (satang/head)	10	30-50	10	50-70

The second and third rows would be the income base for the private enterprise with the first collected for the government. On these basis, a large modern plant (employing over 50 workers and requiring fixed capital investment of 200 million baht) would generate monthly revenues of around 100,000 baht. No foreseeable increase in the processing fee would justify a commercial undertaking.

Closing these facilities to create profitable investment opportunities for the private sector may be politically difficult and would conflict with laws that identify these as a public service to be provided by the local governments.

The only medium term solution seems to be improvement of these facilities under the ownership and management of local governments. The local governments do not seem to be very eager to do so, because the income these facilities generate is not very attractive for them as well, though the issue is critical for both the public health and livestock development for the farmers.

3. Project Components

At present, these facilities generally consist of a large room. There is no equipment and no cold storage. The facilities also employ no staff. The traders bring their own butchers and remove the carcasses immediately.

These facilities can be upgraded to reasonable standards by adding some simple equipment, cold storage and hiring permanent staff (butchers). Without the permanent staff, the farmers are forced to sell through traders/middlemen. They are the only ones who have butchers. With permanent staff in these facilities, the farmers will be able to make delivery contracts with traders and retailers for carcasses. They would pay the processing fee to the slaughterhouse and for the use of cold storage if necessary.

It is not only that the existing facilities are unhygienic. A substantial part of pigs raised by small farmers, and around 75% of cattle avoid the use of these facilities at any cost. It is not clear why there is such an enormous resistance despite government

efforts at policing. The usual explanation is the tax and the fee, but it is unlikely that this is the only reason.

The fee itself is not unduly high. The farmers would probably pay this fee: it is small; will help them market offals at higher prices; and, provided skilled staff is employed, would improve the quality of hides. These probably would more than off-set the fee. Serious consideration should be given to eliminating the tax. It will continue to encourage illegal slaughters which also escape health checks.

The additional equipment needed is overhead rails, weighting scales, electric shock gadget, and trays/trolleys. Additional equipment may be provided on a case by case basis. All facilities should be supplied with a pre-treatment plant for the wastewater.

There will be additional investment at subsequent steps in the marketing chain. This will include cold storage vehicles for transport of whole carcasses: sometimes to local retail outlets, but also for shipment to meat packing plants in Bangkok. Some cold storage for meat in the retail stalls would also be desirable. These, however, will be undertaken by private operators.

4. Project Costs

The major element of the proposed project is not investments, but administrative changes. The financing and management of upgrading is relatively simple compared with the steps involved in re-organization. The following investments will be undertaken only after these issues are resolved.

For the first phase of Master Plan implementation, we are recommending upgrading of three facilities in areas of major population concentration and production basis. These are Nakhon Ratchasima, Si Sa Ket and Ubon Ratchathani. The funds required will be provided as a grant to the local governments.

The local governments would also be required to provide operating subsidies to meet the staff costs. This will be the case even if service fees are substantially increased.

The actual costs of upgrading will vary depending on the existing condition of facilities. They would also vary depending on the level of upgrading. The estimates given below are rough magnitudes of the likely averages per facility.

The facilities need to be repaired and supplied with plentiful water to keep them clean. The cost of overhead rails and trolleys would be around 500,000 baht. The major fixed cost component is cold storage. For an area of 4m x 4m, the cost would be around 2 million baht.

Part of the cost of the staff the municipality is asked to hire should be born by the project. This will reduce the financial burden of this service to the municipality during the initial phase when the resistance to use of these facilities is likely to continue. It should be sufficient to hire 5 experienced butchers per facility and an annual cost of one million baht. Of this half would be granted by the project.

The largest cost component will be the treatment plant. The facility in Si Sa Ket is already attempting to build a treatment plant. Their estimate of cost is 30 million baht.

The total cost per facility for the first year will be three million baht, and nine million baht for the three demonstration projects during Phase-I of Master Plan Implementation, excluding the treatment. The treatment plants would require additional 90 million baht for three facilities.

5. Project Administration

The administration of the proposal project is straightforward. All implementation will be undertaken by the Municipality or Sanitary District Administrations. Initially, it is suggested that priority should be given to three Muang municipalities where the volume of local meat consumption is high.

PROJECT PROFILE - 2

"DAIRY DEVELOPMENT"

1. The Project: Excluding Pak Chong in Nakhon Ratchasima (Chok Chai Dairy Farm), there is no milk production in the Study Area. Two small nucleus groups have formed in the Study Area over the last two years. They supply raw milk to the dairy plants in the Agricultural Colleges in Buri Ram and Si Sa Ket. The processing capacity of these two plants is very small (one ton a day each). Further development of dairy industry in these provinces require a new marketing outlet and provision of extension services to the farmers.

The proposed project will build three milk collection centers. Initially, this milk will be sold to dairy plants that are under construction in Pak Chong and Muak Lek. It is almost certain that private dairy plants will be located in the area after raw milk production exceeds the minimum quantities required to operate a dairy plant: around 100 tons/day compared with the present production of less than two tons/day.

2. Project Rational: The Master Plan proposes that livestock will play a major role in agriculture in the future. Dairy development has not occurred in the Lower Northeast, because it requires many components to be in place at the same time: existance of many village dairy farms to produce the milk; a market for the fresh milk (a dairy plant); technical services in veterinary care, artificial/natural insemination; and forage production. These diverse and interrelated aspects of production, the public nature of some of the services involved (i.e. extension), and the commercial risks of introducing a new activity prevent the private sector from taking the initiative.
3. Project Components: The project will build a milk collection center of 10 tons capacity in Buri Ram, Si Sa Ket and Ubon Ratchathani. Ubon Ratchathani is not only a growing sub-regional market for dairy products, but it also has ample water resources for livestock. The project will also finance one or two trucks for transport of milk to the dairy plant(s). Milk collection from farms to the collection center will be undertaken by the farmers.

The project will also supply extension to the farmers in milk and cattle hygiene, insemination, and production of forage crops.

Interested farmers will procure their own stock. The project will make arrangements with BAAC to finance the farmers. the project would fit well with the Complete Cycle Projects presently supported by BAAC. The Dairy Promotion Organization of Thailand (DPO) and private farms in Pak Chong have the capacity to supply up to 2,500 pregnant heifers a year to the farms to be established. These farms will produce around 20 tons/day of milk and will be sufficient to support the three milk collection centers initially.

There would be no problem in marketing this milk as two new milk factories are under construction in Pak Chong and Muak Lek. It could even be

transported to plants in Bangkok with no loss in quality and a very small additional cost.

Over a two-year period, the project will generate 40 tons of raw milk/day. This is a sufficient base for a private sector factory of 100 tons/day capacity to be established. It may support two to three such factories if they start with low capacity utilization and also utilize imported milk powder.

4. **Project Administration:** The project is designed to promote establishment of dairy farms. Once the milk production base develops, it will encourage private dairy companies to build plants. All project activities, therefore, are transitional.

One possible mechanism is to rely on DPO. The project may hire management services from DPO to operate the milk collection center while the facilities built, through a grant, would be owned by a local development agency. These facilities may eventually be transferred to DPO. In this case, arrangements should be made so that DPO does not prevent establishment of private dairy plants in the future.

Another possibility is for one or both of the Agricultural colleges in Buri Ram and Si Sa Ket to take the initiative. The government, through the Rural Development Committee, will make a grant to the colleges to build the milk collection centers. A condition of the grant will be that the colleges will establish a separated unit to operate the collection centers. The contract with the colleges may also cover extension services. It would be highly desirable if this extension component is eventually controlled and paid for by the dairy farmers. This is the case in most European countries. These farmer groups and individual farmers should also have the option to purchase these extension services from private veterinarians/animal nutrition specialists.

5. **The Project Impact:** The proposed project will improve farm incomes. The estimates of Ministry of Agriculture indicate that milk production is highly profitable at farm level. According to the Ministry, the cost of production per liter of raw milk varies between 5.2 to 5.7 baht depending on the farm type. These costs include the opportunity cost of all labor, capital and land resources used. At these costs, the farmer will earn 2.5 baht/liter, excluding the return to family labor. For a farm with 5 milking cows, producing 10 liters/cow/day, the net profit would be 125 baht/day. Together with the return to labor, the farm income would be around 300 baht/day, or 9,000 baht/month. The land requirement of this farm size would be 20 rai under rainfed conditions, and between 3 to 4 rai if land is irrigated. The average family can thus continue to produce its subsistence rice as well as dairying.

Dairy farming requires the same level of labor input throughout the year and it would reduce the present seasonal peak in labor requirements. Finally, dairy farming will upgrade the cattle stock in the area and make a major contribution to the development of a beef industry. This will be particularly encouraged, if appropriate multipurpose (dairy/beef) breeds are selected. The change in land use pattern to support dairy production will have highly desirable environmental consequences.

6. **Project Costs:** The cost of a milk collection center of 10 tons is around 4 million baht. This includes the stainless steel tank, cooling equipment, weighting scale, test laboratory, and containers for collection. A simple structure is needed for administrative staff. Proto-types are of 6 m. x 6 m. dimension, costing around 500,000 baht. The electricity infrastructure costs an additional 500,000 baht. The total cost of one milk collection center is thus 5 million baht.

Assuming supply of 8 tons/day per milk collection center, 200 farms of 5 milking cows each need to be established. BAAC credit limit per farmer is presently 220,000 baht. The pregnant heifers can be purchased at 25,000 to 30,000 baht/head. The cost of stock purchases would thus be baht 150,000 per family. The remaining 70,000 baht of credit and farmer's equity contribution presumably is sufficient to build the cow sheds. The total financing requirements of farms will thus be 110 million baht (200 families x 220,000 baht per family) per milk collection center.

Technical services is a critical component of project. The project should grant funds to hire two specialists per collection center to advise the farmers and provide veterinary services. In addition, a forage production specialist should be hired for all three collection centers. The cost of the seven staff would be around 2 million baht per annum depending on salary scales and arrangements for transportation.

This project will finance 15 million baht of the three milk collection centers (5 million baht per center), and staff costs of 2 million baht/annum. In additional provision should be made to support the research referred to above. The financing of farm units will be undertaken as a part of the regular operations of BAAC.

The two milk transport trucks will cost on additional 1.5 million baht each. Instead of an outright purchase, however, these may be rented. These will not be needed if the overall responsibility is given to DPO.

7. **Major Issues Involved:** Dairy development can be controversial and politically sensitive if the farmers do not attain the production levels promised by the public agencies promoting dairying. This suggest that the extension services in technical aspects of dairying need to be emphasized. It would also be prudent not to make the decisions on the choice if breeds and stocks to be purchased, but leave the decision totally to the farmers with possible advise and guidance.

The technical package advised to the farmers is not well thought out. It would be useful to conduct a parallel study of appropriate breeds, forage grasses and cultivated forages, feeding systems, and insemination services.

In some areas, year-long availability of clean drinking water for the stock may be a problem. This should be investigated in choosing specific project locations for dairy farms. Areas near major population centers should be given priority so as to promote production of pasteurized milk which poses less marketing problems if the plant is near final consumers. The plant itself will locate near the dairy farms.

PROJECT PROFILE - 3

"RED MEAT PRODUCTION"

1. **The Project:** The proposed project will promote establishment of specialized beef production farms. The participating farmers will purchase male calves at weaning from dairy farms. The cattle will be grazed on a combination of communal (if available) and individual pastures until maturity. They will be fattened and sold to meet part of the demand for high grade beef.
2. **Justification:** Specialized beef raising farm enterprises are not profitable at present. This derives from the poor local breeds with extremely low conversion efficiency of feed into meat; disease prevalence which has a particularly adverse impact on improved breeds; and finally the government monopoly on slaughterhouse which blocks the development of a rational marketing system. Beef production can be highly profitable for the farmers if these three components are simultaneously addressed.

Another constraint preventing beef raising in the region is the financial requirements. As in fruit production, cattle raisers will have a continuous outflow with income accruing at the end of production period. This may extend up to 18 months.

3. **Project Components:** The bulk of the resource requirements of the proposed project will be met by BAAC. It will provide long term credit for the construction or improvement of simple sheds for the stock. It will also finance the purchase of stock and feed through short term credits. The project itself will concentrate on veterinary services and marketing.

The project will finance a veterinarian and animal nutrition specialist to work with the farmers.

The main costs to the project will be upgrading of the slaughterhouses and purchase of few refrigerated trucks for shipment of carcasses to Bangkok and other markets.

The slaughterhouse upgrading requires clarification of the ownership to insure that they are owned and operated by the local administrations. Some simple handling equipment and a small cold storage room needs to be added to selected facilities in Buri Ram, Si Sa Ket and Surin - one in each. The participating local administrations will be required to hire to staff for slaughter. This will improve the health/hygiene conditions and eliminate farmers' dependence on stock merchants.

As an additional precaution, the project may establish a price guarantee fund for the participating farmers. It will finance the difference between the target price and actual market prices at the time of sales for specified quality output: i.e. carcass weights and dressing rations. This last will set standards of technical efficiency for the farmers.

4. **Project Impact:** The development of beef industry is essential for promoting milk production. The male calves produced by dairy farms will become an

important source of income for dairy farms. The Study Area has a good production base to support cattle raising. Silage crops (including maize, sorghum and cultivated forages) will diversify the cropping pattern and reduce irrigation water requirements. Industrial by products (particularly cane molasses) and cassava will form an important part of the feed base. Managed pastures have highly desirable environmental aspects: they reduce soil erosion, improve soil fertility and discharge no chemicals into the water resources.

As in dairying, cattle raising and fattening has a stable labor input requirement throughout the year. It will be highly profitable for the farmers if the marketing constraints are removed.

Beef industry will meet the growing demand for high quality beef which is presently met by imports. It will also contribute to the growth of domestic leather industry which presently relies on imported hides.

5. Project Organization: To be developed by NESDB
6. Project Costs: To be determined
7. Major Issues Involved: Managed pastures are a less intensive form of farming compared with cultivation of cash crops. It is ideally suited for marginal cultivated land. Although managed pastures are not essential for beef raising, such farms could be promoted in areas of problem soils. It would also be suitable for areas with relatively large land holdings per family. Cattle raising needs not to be specialized, but may also be integrated with crop production. In this case, the size of units would be smaller, and should emphasize the use of purchased industrial by products, cassava and concentrates in the planned feed base.

PROJECT PROFILE - 4

"DAIRY DEVELOPMENT"

1. **The Project:** There are two nucleus groups of dairy farmers who supply milk to the dairy plants in the Agricultural Colleges in Buri Ram and Si Sa Ket. The processing capacity of these two plants is very small (one ton a day each). Further development of dairy industry in these provinces require a new marketing outlet and provision of extension services to the farmers.

The proposed project will build two milk collection centers, one in each province. Initially, this milk will be sold to dairy plants that are under construction in Pak Chong and Muak Lek. It is almost certain that private dairy plants will be located in the area after raw milk production in the area exceeds threshold required to operate a plant.

2. **Justification:** The Master Plan foresees livestock development to play a major role in agriculture in the future. The dairy development has not occurred in the Lower Northeast (except Nakhon Ratchasima), because it requires many components to be in place at the same time: existence of many village dairy farms to produce the milk; a market for the fresh milk by building a dairy plant; and technical services in veterinary care, artificial/natural insemination; and forage production. These diverse and interrelated aspects of production, the public nature of some of the services involved (i.e. extension), and the commercial risks of introducing a new activity prevent the private sector from taking the initiative.
3. **Project Components:** The project will build a milk collection center of 10 tons capacity in each province. It will also finance one or two milk transport trucks for transport of milk to the dairy plant(s). Milk collection from farms to the collection center will be undertaken by the farmers.

The project will also supply extension to the farmers in milk and cattle hygiene, insemination, and production of forage crops.

Interested farmers will procure their own stock. The project will make arrangements with BAAC to finance the farmers.

4. **Project Administration:** The project is designed to promote establishment of dairy farms. Once the milk production base develops, it will encourage private dairy companies to build plants. All project activities, therefore, are transitional.

One possible mechanism is to rely on Dairy Promotion Organization of Thailand (DPO). The project may hire management services from DPO to operate the milk collection center while the facilities built, through a grant, would be owned by a local development agency. The other possibility is to transfer these facilities to DPO. In this case, arrangements should be made so that DPO does not prevent establishment of private dairy plants in the future.

5. **The Project Impact:** The proposed project will improve farm incomes. The estimates of Ministry of Agriculture indicate that milk production is highly profitable at farm level. Second, dairy farming requires the same level of labor input throughout the year and it would smoothen the present seasonal peak in labor requirements with idle labor during the next of the year. Finally, dairy farming will upgrade the cattle stock in the area and make a major contribution to the development of a beef industry in the area. This will be particularly encouraged, if appropriate multipurpose (dairy/breed) breeds are selected.
6. **Project Costs:** To be estimated
7. **Major Issues Involved:** Dairy development can be controversial and politically sensitive if the farmers do not attain the production levels promised by the public agencies promoting dairying. This suggests that the extension services in technical aspects of dairying need to be emphasized. It would also be prudent not to make the decisions on the choice of breeds and stocks to be purchased, but leave the decision totally to the farmers with possible advice and guidance.

The technical package advised to the farmers is not well thought out. It would be useful to conduct a parallel study of appropriate breeds, forage grasses and cultivated forages, and feeding systems.

In some areas, year-long availability of clean drinking water for the stock may be a problem, and this should be investigated in choosing specific project locations.

PROJECT PROFILE - 5

"SMALL INDUSTRY DISTRICTS"

1. The Project

This project will support the development of "small industry districts" in the Study Area. These districts will be developed in lots adjacent to the built up areas with a manufacturing base and high growth potential. The districts will be equipped with all the necessary infrastructure and standard type workshops will be built for distribution/sale to individual industrials. These districts will be occupied by small and medium sized industries who are too small for locating in industrial estates, but possess characteristics that make them unsuitable for dispersed location within residential and commercial areas of cities/towns.

2. Project Rationale

A tiny fraction of manufacturing enterprises in Thailand and in the Study Area locate in Industrial Estates. These generally employ over 100 workers and have large land requirements - over 4 rai per enterprise.

Small manufacturing enterprises producing spare parts, simple implements and household goods; manufacturers of wood products and products of cement and clay; and a variety of repair shops (vehicle body and engine repair shops, and turning and welding shops) are scattered throughout urban areas, or locate along the major roads.

The mixed use of buildings between these small manufacturers and residential/commercial uses have adverse environmental impact. In the central urban areas, they create noise and fumes. In the case of location by the roads, they impede the smooth flow of traffic.

This pattern of location also adversely effect the growth of the small manufacturing enterprises. Having occupied whatever building space was available, they find expansion difficult due to space constraints. The existing space is also generally not well suited to the process design and machinery lay-out. Although information is not available on tenancy/ownership of the workshops, within built-up areas tenancy is likely to be prevalent. This, in turn, discourages investments in rationalization and modernization of the workshops.

3. Project Components

Ideally, the project initiative would come from workshop owners. Their association/corporation would purchase a suitable plot. This tract will be equipped with the necessary infrastructure. The association will contract out the building of the standard workshops and transfer the ownership to individual owners.

Initially, the initiative has to be taken by public authorities - either local governments or some specialized agency of the central government. The eligibility for membership needs to be clearly specified. Some service type establishments will not be eligible, and noxious industries, regardless of their size, will not be allowed.

The second reason for public initiative is to plan these districts taking into account the location of public facilities such as fire fighting, post offices, and health facilities. It would also provide space for public services in vocational training, technology services, and marketing assistance.

Finally, public assistance (implicit subsidies) will be needed to make the project commercially viable. This assistance would be needed for providing the physical infrastructure (roads, water, power, telecommunication and waste disposal) and financing through loans at concessionary terms. The public role (particularly of local governments) will also be important in short-cutting the bureaucratic procedures for permits, licenses and registration.

The first step in execution of this project would be preparation of a feasibility study by either NESDB or Ministry of Industry. This will include the specification of eligibility criteria, the number of eligible enterprises in each of the major urban centers in the Study Area, and project costs. The feasibility study will also include a detailed financing plan, and proposals for the administrative form of association/corporation.

Simultaneously, the mayors of Muang municipalities in Nakhon Rathchaisima, Buri Ram, Surin, and Ubon Rathchathni would be contacted to explore the likely size of market demand and availability of land.

The legal/administrative form of the developer of the small industry district will be determined after further studies, and consultations with relevant agencies. However, it is likely to include, as share holders, existing workshop owners who are willing to join the project at inception phase and relevant public agencies. This will possibly include IFCT, Government Housing Bank, local government, and special public funds created to support small, provincial industries such as Small Industries Finance Organization (SIFO). SIFO, in particular, may be a major source finance.

The first step would be land acquisition and provision of infrastructure.

After the land is acquired, developed and the project well publicized, the true market demand will crystallize. The scale of project may have to be revised depending on interest. The public agencies will transfer their shares to the new eligible applicants. The public role in management of the association/corporation will also be reduced or eliminated at this stage. Preparation of tender documents for construction, supervision and eventual transfer of titles will be performed by the Association.

4. Project Costs

The factory type standard buildings presently cost 10,000 to 15,000 million baht per m². The type of small manufactures envisioned at present would need a floor area of between 50 to 100 m².

The site would be designed for single or multi-storey (industrial apartments) structures. The land requirement will depend on type of workshop (the need for loading, unloading, storage and display space), but is tentatively assumed to be double the floor space. Half of the land will be developed as workshop areas and the rest devoted to roads and public facilities.

The number of workshops in each district depends on the number of present and expected workshops and will be different in each Muang. As a notional figure, an

average number of 100 workshops per district is assumed. The total floor area will be 7,500 m², at an estimated cost of 75 million baht. At three million baht/rai, the land cost will be around 45 million baht. Infrastructure will probably cost around 30% of the building construction costs, or 22.5 million baht. The total cost of an industrial district with 100 workshops of 75 m² each will be 142.5 million. Excluding the infrastructure, the cost per workshop will be 1.2 million baht.

It should be sufficient for the workshop owners to finance up to 20% of the cost (210,000 baht) with the rest financed through long term credits with a long grace period. During the grace period, the industries should be given encouragement and advise to acquire new machinery and rationalize their production processes.

At SIFO's present interest charge of 11%/annum, the interest charge per workshop will be 115,500 baht/year. The shop should be sufficient collateral for the loan.

5. Phasing

During the first phase of Master Plan implementation (up to 1996), the target will be establishment of at least two such districts. The total cost of these would be 285 million baht for 200 workshops. The total direct employment in these workshops will be around 2,000. About half of this is likely to be new employment generated. The total new investment per job created will be around 300,000 baht. The number of such districts would be increased during Phase II and III of Master Plan implementation depending upon the experience gained during the first phase.

The evolution of this program will not only be in the number of workshops built. The range of services that they provide to their members should also be expanded. This would include sharing of specialized, large volume machinery, joint marketing/contracting arrangements, and public services in training, technology upgrading, and standardization.

PROJECT PROFILE - 6

"REGIONAL INDUSTRIES MODERNIZATION MODEL PROJECT"

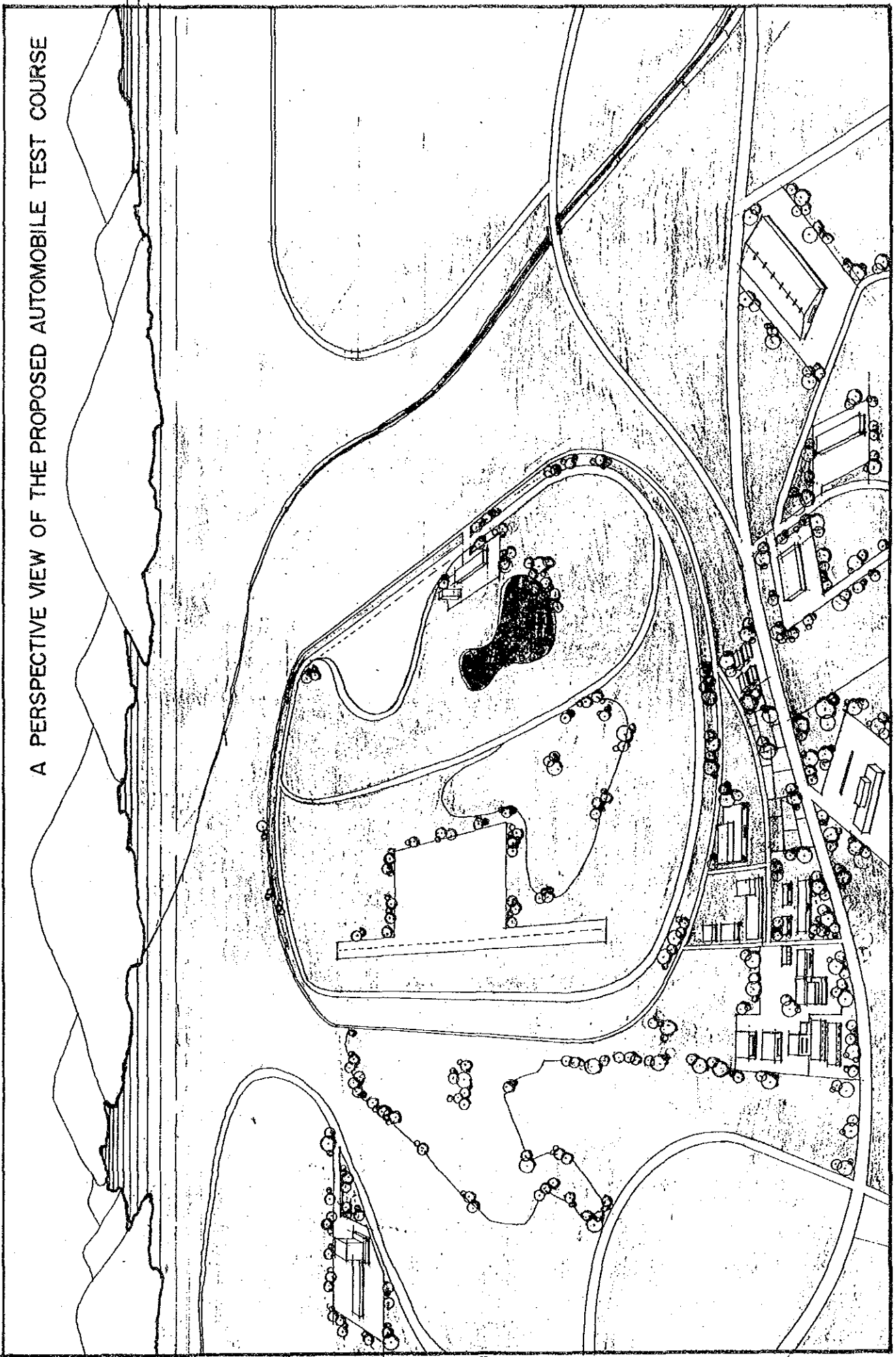
- Location** : Nakhon Ratchasima Province
- Agency** : Ministry of Industry, DID/DIW, IEAT, IFCT
Nakhon Ratchasima Provincial Government
- Description** : The project has the dual objectives. The one is to modernize the existing small and medium scale industries located in the built up areas and facing such problems of pollution, technologies, production facilities, marketing, management and financing. Modernized regional industries will help invite location of new industries seeking dependable sub-constructors. The second is to improve urban environment by elimination of problematic mixed land use and will allow the concerned municipalities to utilize the left out space for public facilities as neighborhood parks etc. which will also lead to attracting people to the region.
- Target Industries** : Automotive repair, food processing, metal plating and textile bleaching and dyeing.
- Timing** : 1st Phase

PROJECT PROFILE - 7

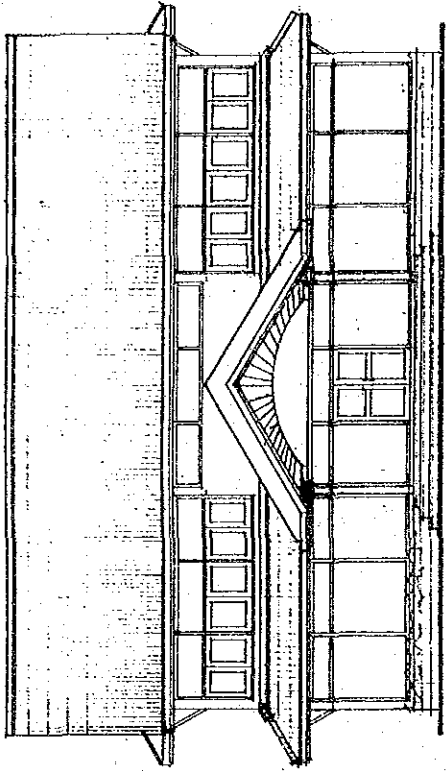
"NAKHON RATCHASIMA AUTOMOBILE TESTING COURSE"

- Location** : Nakhon Ratchasima Province
- Agency** : Undetermined (Possibly Public/Private J/V)
Ministry of Industry
Ministry of Transportation and Communications
The Federation of Thai Industries
(Automotive Industry Club)
- Description** : The propose is to achieve technological advance in the Thai automobile industry for development of its own designed cars with the highest level of local contents. The part of the course could be used for test flights of small aircrafts manufactured by local industry for private use for agriculture and business.
- Field performance test of new engine
 - Aerodynamic research
 - Field performance test of parts and components
 - Road holding performance test
 - Safety device test
- Area Required** : 100 ha ~ 200 ha depending on location
- Cost** : Undetermined
- Timing** : 2nd Phase

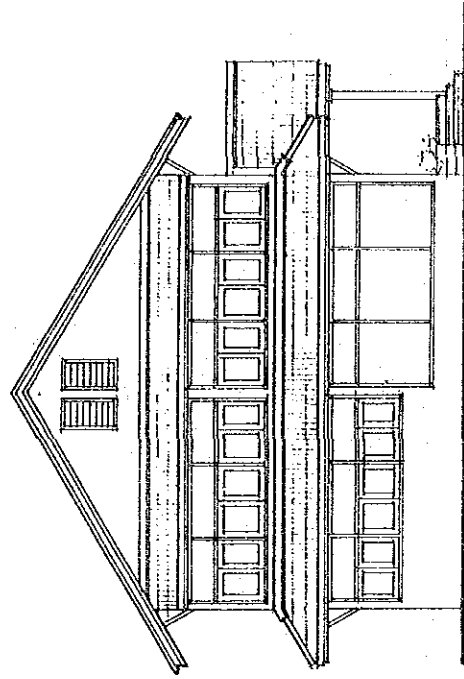
A PERSPECTIVE VIEW OF THE PROPOSED AUTOMOBILE TEST COURSE



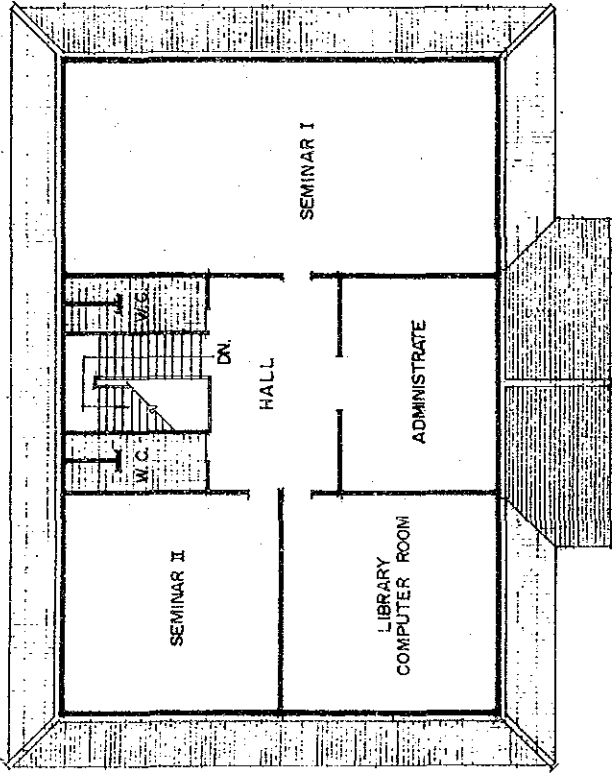
A MODEL PLAN
for
LNE - UE INDUSTRIAL PROMOTION CENTER



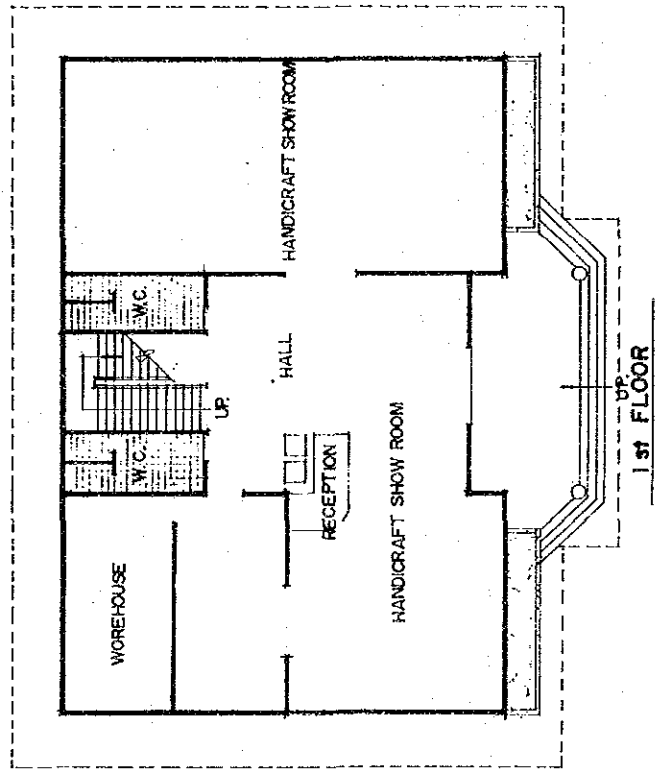
FRONT VIEW



SIDE VIEW

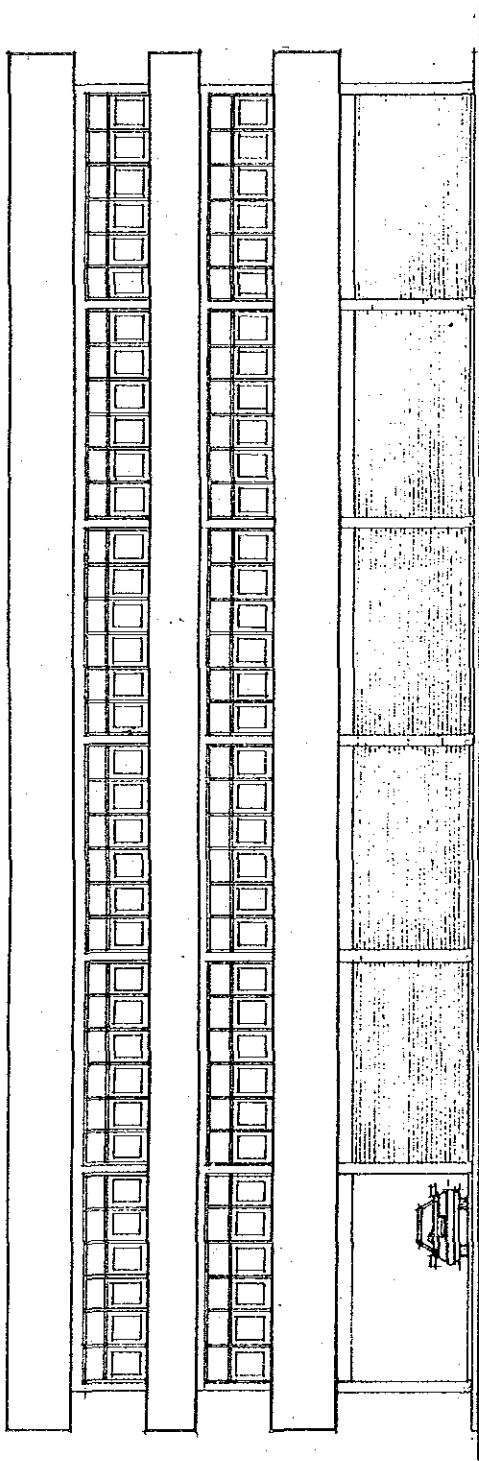


2nd FLOOR

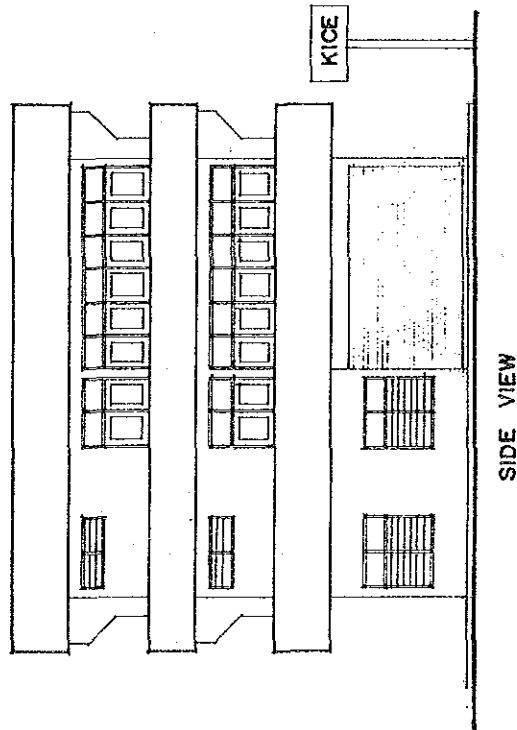


1st FLOOR

A MODEL PLAN
for
KORAT INDUSTRIAL COOPERATIVE ESTATE FOR AUTOMOBILE REPAIRS

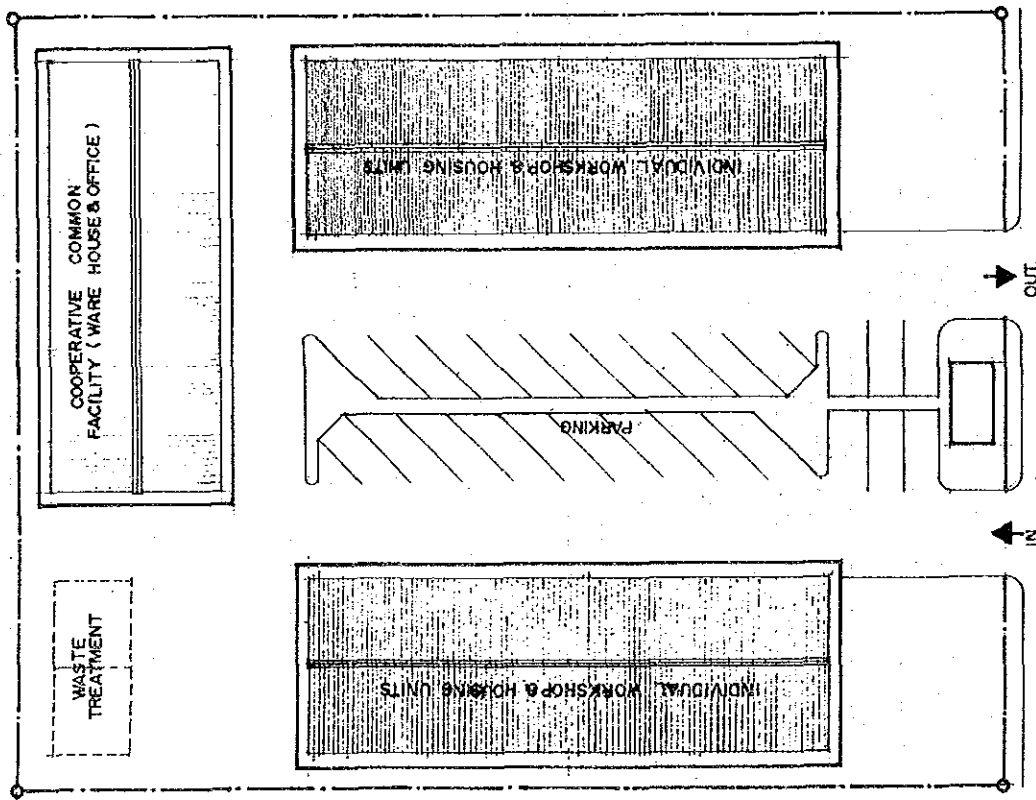


FRONT VIEW

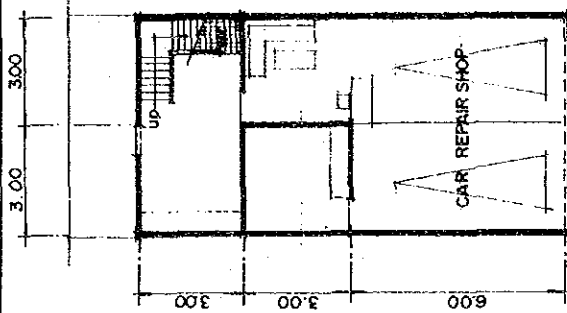


SIDE VIEW

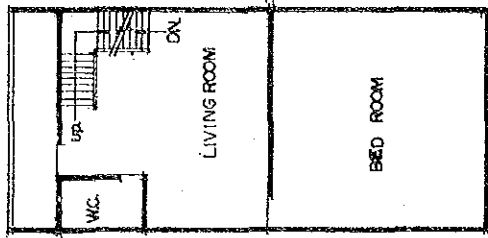
A LAYOUT PLAN OF THE KICE



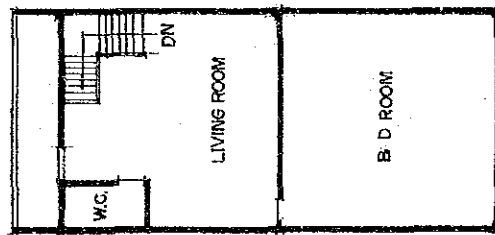
LOCATION 1:500



1st FLOOR



2nd FLOOR



3rd FLOOR

PROJECT PROFILE - 8

"LOWER NORTHEAST INDUSTRIAL PROMOTION CENTER"

- Location** : Surin Province
- Agency** : Department of Industrial Promotion
Ministry of Industry
- Description** : A branch of the Northeast Industrial Promotion Center in Khon Kaen to extend the following services to the entrepreneurs of the Lower Northeast Region as well as to those from Laos and Cambodia.
- Provide services on giving advice and assistances on
 - Marketing
 - Production
 - Finance
 - Management
 - Others
 - Provide seminars and training
 - Provide assistance on finance
 - Provide necessary information
 - Operate a permanent exhibition of the products made by the local industries
- Area Required** : 3 - 5 ha floor space-undetermined
- Cost** : Undetermined
- Timing** : 2nd Phase

PROJECT PROFILE - 9

"KHAO YAI RESORT AND RESEARCH DEVELOPMENT"

- Location** : Khao Yai area, Nakhon Nayok/Nakhon Ratchasima
- Objective** : to establish a R&D park and resort complex to promote advanced technological research and information dissemination
- Components** :
- (1) Establishment of R&D (Research and Development) park
 - (2) Establishment of a resort complex comprising accommodation and recreational facilities
 - (3) Infrastructure development

Description :

- (1) The project aims at establishing a R&D park comprising various research institutes of the government, universities and the private sector as well as accommodation and recreational facilities for tourism conference purpose. The idea is to create an attractive environment for research and development activities, especially for advanced technology fields and promote information dissemination and exchange through establishing accommodation, conference and various recreational facilities.
- (2) Nakhon Nayok is located at a favorable position for the project catching Bangkok, Eastern Seaboard, Upper Central Region, Upper Eastern Region and Nakhon Ratchasima within about a 130 km radius, a day-trip distance. Also Khao Yai is endowed with beautiful natural surroundings with lower temperature, an attraction for conference tourism in contrast with seaside resorts such as Pattaya in the Eastern Seaboard.
- (3) Conferences can be held inviting researchers, professors and entrepreneurs from the surrounding areas, for example, on weekends spending 1 to 2 days.
- (4) The project will take a form of public-private joint venture. Basic concept is similar to that of an industrial estate. The public sector will acquire land and develop it in a coherent and environmentally sound manner together with associated infrastructure facilities. Private investors will either buy or lease the land and construct buildings according to a master plan.

Cost : To be estimated

PROJECT PROFILE - 10

"KORAT SKILL TRAINING CENTER"

- Location** : Muang Nakhon Ratchasima
- Objective** : to establish a skill training center in Muang Nakhon Ratchasima to upgrade skill levels of Lower Northeast population for industrial and trade development
- Components** : (1) Establishment of a skill training center
(2) Provision of equipment
(3) Dispatch of expatriate experts

Description :

- (1) The center has been under construction with assistance from Canadian and German governments following the cabinet approval given in February 1991. The center will be completed and start operation by the end of 7th Five Year Development Plan (1996).

The following description outlines possible major characteristics of the center from the perspective of realizing the LNE-UE regional development master plan. These suggestions can be incorporated into the project's scope for the center to be able to meet various demands anticipated to arise from business society in coming decades.

- (2) Nakhon Ratchasima possesses a number of advantages for establishing a major regional skill development center such as follows.
- There is existing agglomeration of industries, that could be both supplier of teaching resources as well as absorber of graduating trainees.
 - There are a number of existing higher education institutes that can be reliable sources of teaching staff such as Suranaree Institute of technology, Rajamangala Institute of Technology and a government-private joint venture project called Choonhavan Technology Training Center.
 - A strategic position of Nakhon Ratchasima enables the center to aim at population to find jobs within the region as well as intercept potential outmigrants to Bangkok and Eastern Seaboard and train them to upgrade their skills before they move to next job locations outside the region. This latter possibility is anticipated as a transitional phenomenon in a short to medium term until the region becomes self-sufficient in training and providing job opportunities to the regional population within the region.

A rapid industrial growth in Nakhon Ratchasima is expected to continue in the following decades. For Nakhon Ratchasima to lead economic growth of the region as stipulated in the LNE-UE regional development master plan, supply of skilled and semi-skilled labors in a sufficient amount will be an important necessary condition. In this sense, the role of the Center will be major.

- (3) The center is expected to provide industrial trainings in the following fields.

Short-Term (-1996)

- (a) Fields covered at the Ubon Ratchathani Institute for Skill Development such as those mentioned in page 1-16
- (b) Courses/trainings in petro-chemical technology for industries in ESB
- (c) Local resource based industries such as silk, silver and stone work

Medium (-2001) to Long-Term (-2010)

Courses and trainings for the following types of industries are to be provided.

- (a) Courses/trainings in agro-processing industries such as livestock products (meat processing, slaughtering, dairy products), fruits/vegetable processing, grain milling and bakery products, edible oil products, animal feed and sugar
 - (b) Footloose, labor intensive and export type industries such as consumer electronics, watches, toys, garments/textile, artificial flowers, shoes, bags, sporting goods etc.
 - (c) Linkage type industries such as transport equipment, agriculture machinery, rolling stock, and parts and components industries
- (4) In accordance with industrial growth, demand for various types of non-technical jobs is anticipated to expand. The Center will provide trainings and courses for non-technical fields such as accounting, law, and international trade.

PROJECT PROFILE - 11

"THAI - CAMBODIA SKILL DEVELOPMENT CENTER"

- Location** : Aranyaprathet, Prachin Buri Province
- Objective** : to establish a skill development center in Aranyaprathet to upgrade skill levels of population in the Upper East Region as well as Cambodian population
- Components** : (1) Land and building
(2) Equipment
(3) Technical and financial assistance by international aid organization

Description :

- (1) The pivotal location of Aranyaprathet is ideal for a skill training center to serve both Thai and Cambodian populations.

Population groups assumed in this project include the following.

- population in the Upper East Regions that are dependable as workforce for industries to grow in the Eastern Seaboard,
- entrepreneurs in the Upper East Region who are potential investor or trade promoter with Cambodia, and
- Cambodian population living across the border who will be an important asset for rebuilding the country.

- (2) In the coming decades, Cambodia will require a large number of capable workforce in various fields to reconstruct the country starting from rehabilitating physical infrastructure and economic facilities. Thailand can play an important role in this reconstruction process with its geographical position bordering Cambodia and an appropriate level of technological advancement. The project is proposed as a first step measure to realize this concept of technical assistance by Thailand to Cambodia.

Another important factor in formulating the project is necessity for supporting potential Thai entrepreneurs to establish a sound economic relation with Cambodian counterparts. An example is Thai entrepreneurs' involvement in Isarn - Indochina In-Bond Program (IIBP) proposed under "Trade and Distribution Sector". The IIBP concept can be summarized as follows.

Thai side : - investment by Thai entrepreneur on the Cambodian side
- Supply of technology
- procurement of intermediate goods
- shipping/export of products through Thailand

Cambodian Side : - supply of workforce
- procurement of raw materials
- shipping/export of products through Cambodia

Another factor is necessity for upgrading skill levels of the Thai population, especially those living in Upper East Region. (Prachin Buri, Nakhon Nayok and Chachoengsao). With upgraded skill levels, they will be able to improve their income levels by serving industries to grow in ESB and Upper East Region where spillover of industries from ESB and relocation of industries from the Bangkok Metropolis are anticipated.

- (3) A variety of training and courses will be provided for each of different target groups. The courses and trainings to be provided include the following.

Industry

- footloose/labor intensive/export oriented industries (ESB)*
- agro-processing industries (both Cambodia and UE)**
- resource base industries such as wood processing and gem polishing and cutting (Cambodia)
- construction works (Cambodia)
- construction-related industries (Cambodia)
- linkage type industries such as transport equipment and agriculture machinery (ESB and Cambodia)

* ESB : Eastern Seaboard

** UE : Upper East Region (Prachin Buri, Nakhon Nayok)

Business

- foreign language (English, Khmer)
- accounting
- law
- international trade practices

- (4) The project will provide training courses to 500 trainees per year comprising 300 from the Thai side and 200 from the Cambodian side. Programs will be 3 month, 6 month and 12 month depending on requirement.

- (5) Cooperation and strong support of international aid community is indispensable for this type of project.

Cost : 180 x 10⁶ baht *
* Assuming one third of Ubon Ratchathani Institute of Skill Development

PROJECT PROFILE - 12

"NON-AGRICULTURAL EMPLOYMENT IN RURAL AREAS"

1. **The Project:** The proposed project will promote the formation of small industry associations (companies) in rural development centers and will take equity participation. The association will build small industry districts in selected rural development centers.

The members are expected to be artisans in rural areas who are already engaged in businesses. Rural inhabitants who have the skills and financial resources who wish to join the project will be encouraged to do so.

2. **Justification:** At present, Thai government provides incentives to large industries who locate in industrial estates. Small scale manufacturing and repair shop can not locate in these estates because of the minimum plot size requirements and these estates tend to be too far from their customers and residences.

As a result, they tend to scatter within the residential and commercial areas of towns. This is undesirable for the quality of urban environment, and the small industries' growth is constrained by availability and suitability of shop space. The scattered nature of these enterprises also prevents them from utilizing economies of agglomeration. This is true both of central production oriented services and public support facilities as well as in drawing customers. Clustering of shops in a similar line of business (copper, black-smiths, furniture, jewelry, etc.) districts are very common in cities of industrialized countries, mostly because they facilitate marketing.

3. **Project Components:** The proposed project will establish a commercial company (association or stock company) in each of the three provinces: Buri Ram, Si Sa Ket and Surin. The shares of company will be held by artisans, the project and local administrations. Each individual member will be entitled to one share and public agencies will be required to divest themselves of their shares within a fixed period.

The corporations will raise funds from their members with matching funds from the project. The matching funds will be against acquisition of shares by the project. The corporation will buy a track of land in a suitable rural development center. It will develop the land and build workshops. Within a given period, all the shops will be owned individually by the artisans. There will be limitations on the ownership - restricting it to owners who actually work in the shop to prevent speculation.

The pilot locations to be chosen should have a sufficient number of small business. They will be located near existing housing areas, but residential use within these areas will not be permitted.

Government agencies will be encouraged to provide loans to the members towards the purchase of their membership. Infrastructure will be provided free

of charge by the local governments and specialized agencies of the central government.

4. **Project Organization:** To be detailed by NESDB
5. **Project Costs:** It will be sufficient to provide each workshop with a floor area of around 50 m². The cost of building would be around half a million baht per workshop. The cost of land will probably be around 30% of that of building.

The project will supply half of the required capital. The rest will be contributed from members' equity and loans. These loans could be made to individual members or to the corporation.

6. **Project Impact:** The project will enable the small manufacturers/artisans to own their own work places. It will relieve the residential/business areas of a source of noise and fumes. The relocation to the new shops will allow small industries to redesign their production processes and acquire new machinery. This should increase productivity and create additional employment opportunities in rural towns.

All government facilities related to support of small industries will be located in these districts. These will include technology upgrading services, financial institutions/programs, and marketing assistance. Vocational schools will also be encouraged to locate in these districts or run training facilities in these areas on a regular basis.

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