in an area of about 1,000 ha. By this project, one field extension worker (PPL) will be available to about 1,700 farm families within his area, but he will focus his efforts on groups of 10-15 progressive farmers, headed by a contact farmer. Each progressive farmer in turn will transmit the advice received from the PPL to a group of 7-10 neighboring farmers. Each PPL will be assigned 16 farmer groups, visiting each group once a fortnight on a fixed day and time. He will motivate these farmers to rapidly adopt new and improved techniques so that their farms will serve as models to their neighbors.

05.103 Within this framework of the IBRD Extension Project, field-level extension services will be provided from Rural Extension Centers (REC). At each REC, a team of two middle-level extension workers (PPM) will supervise the activities of village unit field extension workers (PPL).

05.104 In the Province there are 930 PPL including 165 honoraries (aged extension servicemen staying at posts without going out to fields) and 36 subject matter specialists (PPS) including 7 honoraries as of the beginning of February 1977 (Table 5.14). As 765 PPL out of 930 work for the field service, one PPL has to cover, on an average, one village unit comprising 600-1,000 ha of irrigated area and 1,500 farm families. This coverage area is too large for one PPL to provide ample extension services. Thus, in the IBRD Extension Project the number of PPL in Central Java is to be increased to 1,230 by 1981. Meanwhile, the Province presently has 84 RECs so that each kabupaten is equipped with at least one REC. But this number too is not enough, thus some more RECs are to be rehabilitated or constructed to achieve 102 RECs by 1981 in accordance with the IBRD Extension Project.

05.105 The National Food Crop Extension Project should be promoted according to a prearranged program. Indeed, it is necessary to increase the number of PPL and REC. But in view of extension methodology already mentioned, the key points of extension effort would be how to organize the group (kelompok) of progressive farmers and how to stimulate a contact farmer's activities rather than the quantitative increment of personnel concerned or facilities such as vehicles and equipment. In this respect, it is of vital importance that, in a context of the National Food Crop Extenstion Project, steady and sound effort should be made to strengthen progressive or active farmers in cooperation with a contact farmer.

05.106 This requires betterment in the extension method and improvement in the quality of PPLs, which will be able to motivate a leading farmer (contact farmer) and make the most of his initiative. These could be implemented in the framework of the IBRD Extension Project which would provide: (a) an extensive program of local level training for extension workers along with a limited number of fellowships and overseas training tours; and (b) introduction of a sound extension methodology with emphasis on continuous trainings and regular farm visits.

Table 5.14 Number of PPL/PPS, Central Java, 1977

(Unit: Persons)

No.	Location	Employee Status		Honorary Status		Total	
		PPS	PPL	PPS	PPL	PPS	PPL
1.	Kabupaten Batang	-	18	1	7	1	25
2.	" Pekalongan	-	16	-	5	-	21
3.	" Pemalang	-	26	-	7	-	33
4.	" Tegal	-	32	1	3	1	35
5.	" Brebes	-	45	-	6	-	51
6.	Karesiden. Pekalongan	2	-	-	-	2	-
	Sub-Total	2	137	2	28	4	165
1.	Kabupaten Semarang	-	27	-	5	-	32
2.	" Kendal	-	23	-	7	-	30
3.	" Demak	-	24	-	2	-	26
4.	" Grobogan	-	26	-	4	-	30
5.	Kares. Semarang	2	-	-	-	2	-
	Sub-Total	2	100	-	18	2	118
1.	Kabupaten Pati	-	29	1	2	1	31
2.	" Kudus	-	12	-	5	-	17
3.	" Jepara	-	17	-	1	-	18
4.	" Rembang	-	22	-	2	-	24
5.	" Blora	-	26	-	2	-	28
6.	Kares. Pati	2	-	-	-	2	-
	Sub-Total	2	106	1	12	3	118
1.	Kabupaten Banyumas	-	39	-	2	-	41
2.	" Cilacap	-	29	-	6	-	35
3.	" Purbolinggo	-	18	-	7	-	25
4.	" Banjarnegara	-	24	1	5	1	29
5.	Kares. Banyumas	3	-	-	-	3	-
	Sub-Total	3	110	1	20	4	130
1.	Kabupaten Magelang	-	25	-	11	-	36
2.	" Temanggung	-	19	-	7	-	26
3.	" Wonosobo	-	19	-	5	-	24
4.	" Purworejo	-	28	-	8	-	36
5.	" Kebumen	-	28	-	9	-	37
6.	Kares. Kedu	2	-	-	-	2	-
	Sub-Total	2	119	-	40	2	159
1.	Kabupaten Sukoharjo	-	24	1	6	1	30
2.	" Karanganyar	-	23	-	7	-	30
3.	" Wonogiri	-	26	-	8	-	34
4.	" Sragen	-	38	-	10	-	48
5.	" Boyolali	-	24	1	7	1	31
6.	" Klaten	-	52	-	6	-	58
7.	Kodya. Surakarta	-	1	-	-	-	1
8.	Kares. Surakarta	2	-	-	-	2	-
	Sub-Total	2	188	2	44	4	232
1.	Tegalgondo	2	2	1	1	3	3
2.	Soropadan	2	2	-	-	2	2
3.	Kodya. Semarang	-	1	-	2	-	3
4.	Inspection	12	-	-	-	12	-
	Sub-Total	16	5	1	5	17	8
	Total	29	765	7	165	36	930

Source: Dinas Regional People's Agriculture.

Agricultural Department, Provincial Government of Central Java.

05.107 Furthermore, it is desirable that a considerable extension effort should be also directed toward second crops, especially, maize, soybeans and peanuts. Practically, this effort would focus upon the following points:

(a) correct choice of a variety to meet each situation;

(b) pre-planting fertilizer applications;

(c) correct row spacing to each situation, depending on variety, fertilizer usage, time of planting and weed control;

(d) insect control; and

(e) local preferences with regard to grain color and cropping pattern.

5.4.2 Dharmatirta Developed in Central Java

05.108 Since a few years ago, dharmatirta, the local irrigation associations in the Province, have shown an interesting development in the field of water management activities. The scope of activities of the dharmatirta is simply formulated as follows[5/]: (1) formulation of plans for irrigation; (2) just distribution of the irrigation water; (3) maintenance of the irrigation system; (4) repair of irrigation networks; (5) construction of new ditches and structures; (6) increase of knowledge and skills; (7) water fee collection; (8) to find out the measures and assistance needed in case the dharmatirta is unable to implement its own program independently; and (9) maintenance of the regulation and rules.

05.109 The village council (rembuk desa) is the highest authority that authorizes planning of irrigation as one component of the overall aspect of development planning. Distribution of water under the new scheme needs close cooperation among the farmers, assistant ulu-ulu (ulu-ulu is a man responsible for operation and maintenance of the community irrigation), ulu-ulu and local irr gation authorities. Consistent with distribution of water, maintenance of the system is carried out by the group of the farmers which is responsible for the respective sub-system. At the quarternery level, the responsibility of coordinating such a group of farmers is given to an assistant ulu-ulu. At the block level (it might be a part of a tertiary block) the responsibility is given to ulu-ulu, and for the whole village the responsibility is by the dharmatirta committee. Small repairs are carried out by the respective group as far as it is able to do that. If it can not, the dharmatirta committee will take the responsibility

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5/ Effendi Pasandaran & Soekotjo Harmoni, Dharmatirta Development in Central Java.

for it; it will do likewise for the construction of new ditches and structures. In doing these, the technical advice is given by the LIS (Local Irrigation Service), which usually at the lower level has its subordinate people of the same or a nearby village. The role of these people is considered very important for the successful implementation of such a program. Their function is not only to act as a channel of communications between the village and the superior authority but also to exercise decisive control in allocating water from the sources (i.e. secondary canals). Therefore smooth relations with such people always have to be maintained. If the cooperation is favorably inclined it can also play a role as instructors to the dharmatirta. Thus, increase in skills and knowledge of officials and members of dharmatirta is being done not only by formal trainings but also by such informal communication with the local government service personnel.

05.110 Water fee collection is another aspect to be considered within the framework of the scope of activities of the dharmatirta. Besides day-to-day operation and maintenance, the building up of turnouts, measuring devices and land consolidation work need an extra amount of funds. Although physical development is carried out block by block, the funds collected are for the whole of the members of a dharmatirta. Most of the routine water fee is in the order of 15 kg per ha of dry paddy in the dry season and 10 kg per ha in the wet season. The magnitude of the extra funds charged to the farmers is usually determined by the ability and willingness of the farmers, which have to be assessed by the village council. In some cases it reaches 100 kg of dry paddy per ha per season, as it is required to speed up the process of development. However, it should be remembered that not all the dharmatirta can be developed independently due to the differences in potential, in terms of their financial and technological ability, among them.

05.111 The assistance from other institutions outside the village is one of the measures necessary for the operation of the dharmatirta. One problem is regulations and rules of the dharmatirta, which should be abided by. This should be reemphasized as an important point since regulations and rules have been broken several times in the past due to political and demographic pressures. The role of the old established village council is being strengthened by the dharmatirta, which is based on the principle that an individual person is a part of a society and therefore he has to conform his behavior with the attitude of society as indicated by the existing rules and regulations.

05.112 From the above, it is apparent that there are many problems to be tackled for the success of the dharmatirta. Difficulties they are facing now are related to the social factors and management aspects rather than to physical and technological ones. If only to physically construct new ditches or to repair existing irrigation networks, it is relatively easy to do by utilizing the Gotong Royong system, which the Government intends to make the best use of for completion of certain basic infrastructure at the village level, e.g., small scale irrigation works as well as desa roads. For example, in the name of

Gotong Royong some provide cash, some provide aid in kind, and others provide labor for the construction of new ditches. The problems exist in the process before or after that stage, and a major part of success or unsuccess of the dharmatirta is dependent upon the faculty of the village leaders concerned, especially the village head, and the extent of democracy within a village.

05.113 Therefore one important role of the Government is to find leaders and to develop the leadership capability of the dharmatirta. Within the context of this role, for example, the local government of Pekalongan has established a pilot project, the so-called "union dharmatirta". This is actually a cluster of villages, organized so that each village is interconnected to the other with rather complete irrigation and drainage facilities. By this, an excess water in one village can be discharged to the other village of the different irrigation system.

05.114 Broader interchange of ideas through broader intervillage communication can be expected from this kind of scheme. The operation and maintenance need full participation of all ulu-ulu and individual dharmatirta leaders. However, in the initial stage, this communication task has to be undertaken by the Government in order to give enough time for dharmatirta leaders to adjust harmoniously to the leadership of the union dharmatirta.

05.115 The success of such an effort as that of establishing the union dharmatirta depends not only on the harmonious relations among ulu-ulu and dharmatirta leaders but also on how well they understand its objective and day-to-day practicality. It seems reasonable that each new irrigation development or rehabilitation project should be followed up with a certain pilot scheme of water management, to develop and demonstrate the best practices of water management at the farm level.

05.116 As for the Gotong Royong system, it will function as an effective means for mobilizing resources for rural development, although it may not be an efficient one because of its quasi coercive nature. Even if certain basic infrastructure at the village level was completed relatively easily by utilizing the Gotong Royong system, this was done solely depending upon faculty of the village leaders, especially the village head, through whom the initiative of the village community is channeled to Gotong Royong activities. Nevertheless, the Gotong Royong system is to be utilized as far as possible in implementing rural development projects.

5.5 Proposal for Future Actions and Recommendations

5.5.1 Marketing

05.117 Recommendations are as follows:

(1) Measures urgently needed include: greater freedom for traders in the private sector, elimination of the excessive charges and duties (official and unofficial) levied on goods movements especially at ports, reduction of the costs of transport through improved facilities such as ports and main highways, and upgrading of management capabilities of BUUD/KUDs. Unnecessary check by officials at check point should be urgently abolished.

(2) Loans to cover marketing costs should be also available to traders. But, these loans should be developed as a number of reliable borrowers increases and in relation to their needs. It is very important to assess credibility of borrowers. Such selective loans are effective for medium traders who would be able to cope with non-indigeneous national traders.

(3) A fund for marketing credits should be increased to be provided to those BUUD/KUDs which have rice mill facilities, as additional working capital. More credit is clearly desirable, since credit is a major bottleneck in the activity of BUUD/KUDs to store and move rice. A typical rice mill operation may require two or three times as much operating credit as the value of the mill. Assuming that the operating credit will cover the working capital for existing 100 units of rice mill facility (250 to 300 kg per ha) and that an additional 100 units are required for the next five years, the necessary fund for the operating credit will be at the order of Rp.700 million.

(4) A study should be undertaken to examine the feasibility of alternative marketing methods of palawija (second crops) through BUUD/KUDs. Methods to be considered include: 1) a price support system through BULOG/DOLOG, 2) a long-term purchasing agreement with importing countries, and 3) processing and/or storing of produce at the BUUD/KUD level. At the present moment, in view of promotion of planting soybeans and peanuts (see Chapter IV "Agriculture, Livestock, Fishery, and Forestry") and of peanut and soybean oil manufacturing industry (see Chapter VI, "Mining and Manufacturing"), a study on soybeans and peanuts should be started immediately with current staff within the Ministry of Agriculture and the Directorate General of Cooperatives.

(5) A considerable effort should be made for the rehabilitation of storehouses of the DOLOG of the Province, since only 10 percent of the 67 existing storehouses are reported to be in good condition. With rehabilitation we can expect sizable decrease of loss during storage. The estimated cost for the storehouse rehabilitation will be at the order of Rp.500 million.

(6) Candak Kulak program should be continued since we can expect, to some degree, favorable effects both upon small traders in the rural area and upon BUUD/KUDs through the practice of credit operation. In this case, it is desirable to maintain the basic policy that only qualified KUDs be permitted to perform that credit operation.

(7) Development of the rural credit system in this country should be approached from two angles. First, there is an urgent need for prompt results as is the case of the BIMAS credit and Candak Kulak credit. Second, the longer-term objectives should be established, and then policies and actions should be consistently directed toward attainment of these objectives. This implies the need of coordination and consolidation between short-term credits granted by BUUD/KUDs, village banks (BD) and Peoples Bank (BRI); and medium-term credits provided by BRI, Regional Development Bank (BPD), and Sub-District Credit Body (BKK). It is of vital importance that a review should be made as to how to utilize the limited funds efficiently through this variety of rural credit programs. One probable answer to this may be strengthening of BPD-BKK-BKD (village credit body) credits on the one hand, and absorption of BD into BRI Unit Desa on the other hand, to attain more efficient banking activities.

5.5.2 BUUD/KUD and Other Rural Organizations

(a) Functional Improvement of BUUD/KUDs

05.118 As regards the policy for further development of BUUD/KUDs two alternative views are recognized. One is to strengthen the existing functions of distributing farm inputs and marketing and processing rice, and to prevent BUUD/KUDs from performing other functions until they establish their position. The other is to strengthen cooperatives' own marketing and financing functions. At this moment, the former is considered to be the more appropriate approach in the light of present administrative capacity of BUUD/KUDs' personnel. The latter, however, is also a proper course of development in the near future because most BUUD/KUDs have their origin in consumers cooperatives, agricultural cooperatives, or short-term

credit cooperatives, which had experience in credit operations. In either case, agricultural extension services now provided by PPL should not be taken over by KUDs. Extension activities now conducted under the five Directorate General of the Ministry of Agriculture do not fit to BUUD/KUDs' function not only from the administrative point of view but also from the viewpoint of the absence of necessary linkages to their current operations.

(b) Rural Credit System

05.119 If KUDs are to participate actively in the rural credit system in the near future, it must be recognized that the practical realities of the situation require that first consideration should be given to the establishment and maintenance a sound financial basis of KUDs. In order to strengthen the financial basis of KUDs, existing legal provisions and standard bylaws (mentioned above) must be modified especially with respect to allocation of earnings and the accumulation of reserves.

05.120 Along this line, the following is recommended for KUDs to start credit operations. The standard bylaws should require that 100 percent of net earnings be allocated to reserves until the total of reserves and savings (exclusive of those subject to withdrawal prior to termination of membership) reaches at least 10 percent of the maximum loan outstanding in the immediately preceding year.

05.121 Furthermore, inclusion of contribution by the Government to the capital of KUDs (as distinguished from credit) is recommended. This also gives KUDs ready access to funds from outside sources, while this provides to the Government direct participation in decision-making of the respective organizations. However, such direct participation should be reserved for special cases.

05.122 Recommended modifications in existing legal provisions are as follows:

(1) As to Article 34 in the 1967 Cooperative Law (no.12), a single allocation of net earnings is recommended to replace the present dual allocation system in the paragraph (3) of the Law.

(2) As to Article 35, the paragraph (1) should be replaced with specific provisions for minimum reserves to be accumulated and maintained in agricultural credit cooperatives. Authority for individual KUDs to regulate the accumulation and disposal of the reserve fund should be eliminated.

(3) And, as to Article 40, capital from the Government, as distinguished from credit, should be included, with reference to regulation by special legislation.

(c) Selective Subsidy

05.123 At least in so far as KUDs are concerned, any subsidy from the Government should be on a selective basis, depending primarily on the urgency of farmers' justifiable needs for expanded credit service and on the capability of the KUD to handle the provision of credit services.

(d) Improvement of Administrative Capability

05.124 In order for BUUD/KUDs to perform the assigned functions and strengthen their viability, improvements are needed in personnel capability, personnel management, administrative procedures and compilation of essential statistical information.

05.125 Many BUUD/KUD personnel need education and training in elementary business and financial management such as accounting, reporting and auditing procedures and credit operations. The scarcity of qualified personnel certainly is a bottleneck for further expansion of the organizations and qualification of candidates should be considered as an important factor for recruitment of members.

05.126 Currently, BUUD/KUDs are required to present a number of reports to supervising agencies. However, many of the reports prepared are unnecessarily complicated and difficult to understand, and have doubtful value as information for guidance. It is recommended that these reports be simplified and more sharply focus on essential matters. Consideration should be given to improvement of the quality of the reports by BUUD/KUDs as well as to improving accuracy and early availability of statistical information.

(e) Incentive System

05.127 In addition, in order to place these organizations on a sound financial basis, an incentive system should be introduced to the management. A part of net earnings obtained through their regular functions could be earmarked for distribution to the personnel in proportion to individuals' contribution.

(f) Bases for Selecting KUDs for Credit Operation

05.128 Plans of the future role of KUDs in a rural credit operation should take fully into account of the limitations resulting from availability of qualified personnel. Consequently the participation of KUDs to credit operations should be governed. This requires the establishment of criteria in determining eligibility to participate as well as the degree of participation. Bases to be employed in determining participation should include:

(1) past record of performance in handling BIMAS packages;

(2) past record of performance in handling its own credit program as well as other activities including Candak Kulak credit operation;

(3) result of audits and effectiveness in correction of any deficiencies revealed;

(4) financial position and progress;

(5) availability of alternative credit channels; and

(6) reports of Cooperative Inspectors including their ratings as to organization, activity and attitude of personnel and members.

(g) Extension Service System

05.129 The National Food Crop Extension Project should be promoted according to a prearranged program. Indeed, it is necessary to increase the numbers of PPL and REC. But in view of the extension methodology already mentioned, the key point of extension efforts would be how to organize the group (kelompok) of progressive farmers and how to stimulate a contact farmer's activities rather than the quantitative increment of personnel or facilities concerned. In this respect, it is of vital importance that, in a context of the National Food Crop Extension Project, steady and sound effort should be made to foster progressive or active farmers in cooperation with a contact farmer.

05.130 These could be implemented in the framework of the IBRD Extension Project which would provide: (1) introduction of a sound extension methodology with emphasis on continuous training and regular farm visits; and (2) an extensive program of local level training for extension workers along with a limited number of fellowships and overseas training tours.

(h) Palawija Extension Service

05.131 A considerable extension efforts should be also directed toward second crops (palawija), especially, maize, soybeans and peanuts. Practically this efforts would focus upon the following points:

(1) correct choice of variety to each situations;

(2) pre-planting fertilizer applications;

(3) correct row spacing to each situation, depending on variety, fertilizer usage, time of planting and weed control;

(4) insect contro; and

(5) local preferences with regard to grain color and cropping pattern.

(i) Gotong Royong

05.132 The Government intends to make the best use of Gotong Royong for completion of certain basic infrastructure at the village level, e.g., small scale irrigation works as well as desa roads. Gotong Royong, indeed, would function as an effective means for mobilizing resources for rural development, but success or unsuccess of the result depends nearly upon such faculty of the village leaders, especially the village head through whom the initiative of the village community is channeld to Gotong Royong activities. Therefore, Gotong Royong system is to be utilized as far as possible in implementing rural development projects.

CHAPTER VI

MINING AND MANUFACTURING

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MINING AND MANUFACTURING

6.1 Introduction

06.001 This chapter consists of six sections following this introduction. In the second section, a brief analysis of the mining sector in the Province is presented. In the development plan of the Province for Repelita II (Central Java Repelita II)[1/], only 1 page was allocated to this sector. We can not say much about this sector as it now is so small and contains many unknown aspects regarding quantities and qualities of mineral deposits in the Province. In the third section, a general discussion of the industrial sector is presented, through a comparison to other provinces in Java Island. In this section, the relative importance of the small-scale and household industries in the Province is stressed. In the fourth section, the structure of the industrial sector in the Province is further analyzed in terms of distribution of establishments by scale and by branches of industry in addition to an analysis of spatial distribution or industrial locations. In the fifth section, growth of production and future perspectives are discussed for each major branch of manufacturing industry in the Province. In the sixth section, Government measures for promoting the industrial sector in the Province are discussed and possibilities of some alternative development strategies and programs for accelerating industrial growth are argued. Finally, a set of recommendations are derived from these exercises.

06.002 This chapter, however, does not deal with loan and credit policies, or manpower policies, which are studied in chapters II and XIII.

1/ Propinsi Daerah Tingkat I Jawa Tengah, Rencana Pembangunan Daerah/ Modernisasi Desa Tahap II, 1974/75 - 1975/79, 1974.

6.2 The Mining Sector

06.003 The mining sector in the economy of Central Java is very small as it occupies only 1 percent of the gross regional domestic product and employs 0.09 percent of the economically active population of the Province, as of the middle of the 1970s. It is said in the development plan of the Province that the Central Java Provincial Government collected precise data concerning the location and the quantity of the deposits, and undertook its qualitative analysis, during Repelita I. However, it seems that this statement is somewhat dubious since the Study team has been unable to locate such data on the mining industry except for information on the locations of mineral resources. For example, in the development plan mentioned in section one and a publication of BKPM-D [2/] which is circulated to potential investors, there is no information concerning the quantity of deposits and the results of their qualitative analysis. In fact, the Central Java Provincial Government allocated Rp.2.5 million for research funds in the year 1974/75. This amount may be too small to conduct an overall geological survey of mineral resources in the Province. Nevertheless, the identity and range of recoverable mineral resources in the Province is shown below:

Resource	Location
Asbestos and talcum	Kebumen and Wonogiri
Quicksilver	Cilacap and Demak
Coal	Rembang, Wonogiri, Kebumen and Brebes
Gypsum	Rembang, Blora and Kebumen
Chalk (lime)	The whole area of Central Java
Sulphur	Wonosobo
Gold	Wonogiri
Kaoline	Klaten and Banyumas
Manganese ore	Magelang and Kebumen
Marble	Klaten and Banjarnegara
Silica sand	Rembang and Blora
Ferrous sand	Cilacap and Jepara
Phosphate	Kebumen, Pati and Purwokerto
Cement	Cilacap, Rembang
Diatomaceous sand	Sragen and Boyolali
Copper	Wonogiri
Trass	Semarang, Pati and Boyolali
Petroleum	Cilacap, Purwokerto, Kendal and Blora

Source: BKPM-D, Centres of Development in Central Java, 1976, p.19.

2/ Circulated by the Badan Koordinasi Penanaman Modal Daerah (Investment Coordination Board of the Province), abbreviated as BKPM-D.

06.004 At the present, only a few kinds of mineral resources are actually mined. These are iron sand in Cilacap, marble in Merden Banjarnegara, trass in Ungaran Semarang and lime and sandstone in locations almost everywhere in the Province. The total amount of capital investment in the mining industry is only Rp.1.5 million, and the industry employs nearly 1,000 workers. It seems that the Central Government has not yet shown any significant interest in exploring the potentials of mineral resources in the Province. Because of this, the Provincial Government has to take initiatives in the promotion of mining industry in Central Java. This lack of action by the Central Government partly explains why the Province has not developed its mining industry. Nevertheless, it is a pre-requisite for developing a mineral resource industry to identify the quantities and qualities of mineral resources which can be exploited. Therefore, the Provincial Government must keep up its own investigation concerning mineral deposits in the Province.

06.005 It seems to the Study team that there is a quite good prospect in intensifying the quarry industry in the Province since much-needed improvements in road conditions should require a vast quantity of stone and gravel. In addition, the quarry industry is marked by an intensive use of labor. It is quite feasible to improve seasonal feeder roads to all-season roads by using a large quantity of stones as many other developing countries are actually doing. This kind of productive activity is quite suited to self-help movements and voluntary participation of rural inhabitants in improvement of their own communities.

06.006 Another aspect in promoting the mining industry in the Province is to find out means for utilizing its limestone deposits. It is worthwhile to consult with UNIDO in order to obtain information about the better utilization of limestone.

06.007 In any case, it is regretted to note that at the present little significance may be assigned to the mining industry in the Province in view of lack of information about mineral resources there.

6.3 The Industrial Sector in Central Java

6.3.1 Overall Growth

06.008 Gross regional domestic product (GRDP) in Central Java increased from Rp.329,416 million in 1969 to Rp.385,923 million in 1973, while the value of industrial production rose from Rp.47,748 million in 1969 to Rp.55,107 million in 1973. Roughly speaking, therefore, the share of the industrial sector in the gross regional domestic product remained unchanged at a level of nearly 13 percent during Repelita I. Real growth rates of gross regional domestic product and

of the manufacturing industry in Central Java during 1969 to 1971 were 8.1 percent per annum and 7.4 percent per annum respectively. Compared to growth rates of gross regional domestic product and of manufacturing industry in East Java, namely, 10.1 percent and 15.3 percent respectively, Central Java tends to have made slower development than East Java during Repelita I. However, average growth rates of sub-sectors in manufacturing industry in Central and East Java reveal a different picture. The growth rate of large and medium scale industries in Central Java was 3.7 percent as compared to 13.9 percent in East Java, while that of small scale industries in Central Java was 20.0 percent as compared to 17.6 percent in East Java.

6.3.2 General Structure of the Industrial Sector

06.009 According to the 1971 Census, there were 818,296 persons engaged in a variety of activities in the industrial sector in Central Java. This meant that about 10 percent of the total economically active population in Central Java were in the industrial sector. According to the Survey of Manufacturing Industries in 1971, there were 132,518 persons employed by large scale establishments, and 67,762 persons employed in medium scale establishments. Subtracting the number of persons employed by large and medium scale establishments from the total number of persons economically active in the industrial sector, we get a balance of 618,016 persons who are presumed to have been working at small scale establishments and household and cottage industries in Central Java. We may think, therefore, that a quarter of the total number of persons engaged in the industrial sector was employed in fairly well organized modern industries, while nearly three-quarters of them were engaged in unorganized traditional industries. Because the number of persons engaged in the industrial sector increased only by 71,000 persons between 1971 and 1975, the structure of employment by the two sub-sectors should have remained unchanged until now.[3/]

06.010 Central Java Repelita II (the second stage Regional Development/Rural Modernization, 1974/75-1978/79), however, provides us with a much different figures for the number of persons engaged in the industrial sector in Central Java (see Table 6.1). It estimated that the number of persons working in the industrial sector increased from 542,000 in 1969 to 2,050,000 persons in 1973, or by an increase of nearly 380 percent during Repelita I. It also projected that it will increase to 4,100,000 persons by the end of Repelita II. Although we are unable to find any methods of estimation used in this projection, it appears to be grossly unrealistic to believe such a rapid growth of industrial employment in Central Java.

3/ Data Perindustrian, Jawa Tengah, 1975/76, p.5.

Table 6.1 Growth of the Industrial Sector[1/] in Central Java During Repelita I and Projected Growth During Repelita II

Year	Number of Persons Engaged (Thousand Persons)	Value Added (Rp. Mil.)
1969	542	45,032
1970	774	53,432
1971	973	58,237
1972	1,325	65,491
1973	2,050	73,685
1974	2,500	83,000
1975	3,000	90,000
1976	3,400	110,000
1977	3,700	125,000
1978	4,100	145,000

Note: 1/ For 1969 to 1973 (Repelita I), actual figures.

For 1974 to 1978 (Repelita II), estimated figures.

Source: Provincial Government of Central Java, Second Stage Regional Development/Rural Modernization, 1974/75 - 1978/79, (English translation of Propinsi Daerah Tingkat I Jawa Tengah, Rencana Pembangunan Daer/ Modernisasi Desa Tahap II, 1974/75 - 1978/79, 1974).

06.011 It may be useful to understand the structure of the modern industrial sector of Central Java in comparison to that of other provinces in Java Island. Let us define that large and medium scale establishments in manufacturing industry comprise the modern industrial sector. Central Java had approximately 20 percent of the total number of large scale establishments in Java Island and 22 percent of the total number of employed persons in the large scale establishments in Java Island. In Central Java, 8 percent of the total number of establishments in the modern industrial sector were of large scale, while the corresponding figures were 15 percent in Jakarta and West Java and 20 percent in East Java.

06.012 It is also important to note that 17 percent of large scale establishments in Central Java did not have any power equipment. Those establishments, large in scale but without power equipment, employed 18 percent of the total employment in the modern industrial sector in Central Java. The proportions of such kinds of large scale establishments in other provinces were much smaller, except in East Java, and the proportions of employment by those establishments in the modern industrial sector were much lower in other provinces, e.g., 5 percent in Jakarta and West Java.

06.013 These facts may well indicate that Central Java has not only a proportionally lower number of large scale establishments in the modern industrial sector as compared to other provinces but also it has a proportionally larger number of establishments and of employed person at those without power equipment.

06.014 Similarly, Central Java, compared to other provinces, has a proportionally much larger number of medium scale establishments which do not have any sort of power driven equipment. 66 percent of the medium scale establishments in the modern industrial sector in Central Java did not have power equipment. The corresponding figures were 22 percent in Jakarta, 24 percent in West Java and 47 percent in East Java. In terms of employment, 74 percent of the employees in the medium scale establishments in Central Java were employed by those without power equipment. This figure should be compared to the corresponding ones in other provinces: 25 percent in Jakarta and 33 percent in West Java.

06.015 Central Java has been suffering from massive underemployment and unemployment problems. In this regard, application of labor-intensive technology should play a significant role in creating employment opportunities. However, it appears that in the Province there is already much employment of labor-intensive technology even in the modern industrial sector. As is shown in a later section, Central Java is said to have nearly 42 percent of the total number of the household and cottage industries existing in Java Island as a whole. Accordingly, the labor-absorbing capacity of the industrial sector in Central Java may not increase by mere advocation of labor-intensive technology. In some cases, selective mechanization should be encouraged

to enhance labor-absorbing capacity, and in other cases, organizational rearrangement in employment of workers in labor-intensive production processes may be called for in order that employment opportunities can be further created. We shall come back to those issues in later sections.

6.3.3 Changes in the Structure of Industrial Sector by Size of Establishment

06.016 The structure of the industrial sector by scale of establishment is shown in Table 6.2. The total number of industrial establishments fluctuates considerably year by year. This is particularly because of statistical coverage of small scale industries, and also partly due to a change in definition of scale of establishment. Taking for example two years, namely 1972 and 1974, the number of small scale establishments changed from only 2,641 in 1972 to 28,547 in 1974, while numbers of large scale and medium scale establishments dropped in the same two years. Since the definition of the scale of establishment was consistent between those two years, the changes in number of establishments in each category of scale must be interpreted as a result of different statistical coverage.

06.017 It should be difficult to collect an accurate industrial statistics for small scale industries. However, it should not be so difficult to at least obtain the numbers of establishments classified as large and medium scale. Nevertheless, the number of large scale establishments dropped from 403 in 1972 to 288 in 1974 and that of medium scale establishment dropped from 4,827 in 1972 to 3,341 in 1974. In such a short time span, such drastic changes in the actual number of large and medium scale establishments can not take place. An officer in charge of compiling industrial statistics at the Provincial Government was unable to provide the Study team with a convincing explanation regarding those changes in the number of establishments, since his office was dependent on the reports from industrial officers in kotamadyas and kabupatens, so that an error in counting numbers of each category of establishment seems to have been made at this level.

Table 6.2 Distribution of Establishments by Scale[1/], 1970-1975

Year	Large	Medium	Small	Total
1970(a)	367	4,430	-	-
1972(a)	403	4,827	2,641	7,871
1974(a)	288	3,341	28,547	32,176
1974(b)	284	1,351	8,538	10,173
1975(b)	411	1,678	32,728	34,817

Note: 1/ Definitions of scale of establishment for 1970(a), 1972(a) and 1974(a) are as follows:

Large scale : 100 persons or more of employees for establishments without machine, or 50 persons or more of employees for establishments with machine;

Medium scale: 10 to 99 persons without machine, or 5 to 49 persons with machine; and

Small scale : 1 to 9 persons without machine, or 1 to 4 persons with machine.

The definitions for 1974(b) and 1975(b) are:

Large scale : 100 or more of employees;

Medium scale: 20 to 99 employees; and

Small scale : 1 to 19 employees.

Sources: 1. For 1970, Survey of Manufacturing Industries, 1970.

2. For 1972, Data Perindustrial Jawa Tengah, 1972.

3. For 1974(a), Data Perindustrian Jawa Tengah, 1974/75.

4. For 1974(b), BAPPEDA, Jawa Tengah Dalan Angka 1973-1975, Jawa Tengah.

5. For 1975, Data Perindustrial Jawa Tengah, 1975/76.

6.3.4 Industrial Structure by Branches of Manufacturing Industry

06.018 In terms of industrial structure by brahches of manufacturing industry in Central Java, it is textile industry which occupies the largest share both in the number of establishments and employment: 26 percent of the total number of establishments and 33 percent of the total employment in the industrial sector. The second important manufacturing industry is food and beverage manufacturing which comprises 16 percent of the total number of establishments and 17 percent of total employment. Clay and stone product manufacturing is third in terms of number of establishments, occupying 8 percent of the total, while its employment is 5 percent of the total. Tobacco manufacturing industry is small in terms of its number of establishments but large by its employment: 22 percent of the total employment is found in the tobacco manufacturing industry. If we add wood and related product manufacturing industry, the above mentioned 5 industries occupy 53 percent of the total number of establishments and 80 percent of the total number of employment in Central Java (see Table 6.3 and Table 6.4).

06.019 Although there are nearly 1,700 establishments employing approximately 10,000 workers in basic metal and metal processing industries, only 1.4 percent of the establishments in these manufacturing industries are large scale, and the overwhelmingly large majority of the establishments are of small scale, the characteristics of which will be discussed in detail in a later section.

6.3.5 Excess Capacity in the Industrial Sector

06.020 It appears to the Study team that there are some serious problems related to capacity utilization in the industrial sector in Central Java. Table 6.3 reveals a gap between the number of registered establishments and that of actually operating. For example, in 1975/76 there were 38,697 establishments which had been registered for industrial licenses, while among them 34,850 establishments were actually operating in the same year. In other words, nearly 10 percent of the registered establishments in the manufacturing industry were not actually engaged in production in 1975/76. Nearly 14 percent of establishments in the textile industry ceased to engage in active production in the year. Mr. Diojodipuro pointed out the fact that a number of small textile mills in Pekalongan were forced to close down owing to the competition with large scale modern textile factories most of which are financed by foreign investments[4/]. As presented in paragraphs 06.034 through 06.040, another reason for underutilization of industrial production capacities is insufficient development of distributive and marketing acitivities.

4/ Institute of Development Economics, Performance and Prospective of the Indonesian Economy, 1976, p.164.

Table 6.3 Number of Enterprises by Industry and by Size in Central Java, 1975 and 1976

Industry	Actually Operating Enterprises				Listed Enterprises
	Large	Medium	Small	Total	Total
Food & Beverage	97	368	5,570	6,035	6,365
Tobacco	34	64	310	408	433
Textile	108	627	7,884	8,620	10,059
Leather	5	9	167	181	182
Woods & Furniture	60	130	957	1,149	1,160
Paper & Printing	61	80	226	367	373
Chemical, Rubber & Plastic	30	84	176	290	300
Clay & Stone Products	10	119	2,716	2,845	2,983
Basic Metal	4	-	-	4	5
Metal Manufacturing	21	163	1,511	1,696	1,702
Other Industries	11	34	13,211	13,256	15,317
Total	411	1,678	32,728	34,850	38,697

Source: Data Perindustrian Jawa Tengah, 1975/76.

Table 6.4 Employment by Industries, 1975/76

(Unit: Persons)

	L+M+S[1/]	%	S+H[2/]	%
Food & Beverage	40,791	17	109,000	30
Tobacco	51,553	22	1,000	3/
Textile	78,209	33	62,000	17
Leather & Related	2,741	1	1,000	3/
Wood & Wood Products	7,477	3	7,000	2
Paper & Printing	7,173	3	-	-
Chemical, Rubber & Plastic	8,273	4	1,000	3/
Clay & Stone Products	12,008	5	30,000	8
Basic Metal	363	3/	-	-
Metal Processing	9,684	4	8,000	2
Other Industries	15,465	7	140,000	39
Total	233,737	100	359,000	100

Notes: 1/ L+M+S: Employment in large-, medium- and small-scale establishments. Definition of small scale is the same as in Table 6.2.

2/ S+H : Employment in small-scale and household industries. Household industry is defined to mean small-scale industries operating irregularly when time is available, and employing, including family workers, less than 4 persons. This explanation was given by Dinas Perindustrian Jawa Tengah.

3/ Less than 1 %.

Sources: 1. L+M+S: Data Dinas Perindustrian Jawa Tengah, 1975/76.

2. S+H : Inventarisasi Industri Kecil dan Kerajinan Propinsi Jawa Tengah 1976.

06.021 As mentioned, considerable numbers of manufacturing establishments in Central Java are not equipped with power-driven equipment or machines. Hand weaving mills are typical of the equipment presently in use. We will discuss in detail the dualistic structure of technology applied in manufacturing industry in Central Java in a later section. What should be emphasized here in relation to the gap between the number of registered and actually operating establishments is that the manufacturing capacity among those establishments which were forced to close down can be interpreted as being excess capacity of production.

06.022 One may argue that it is an inevitable process that the traditional technology like hand weaving has to be driven out of the industrialization in developed countries. Admittedly, this line of argument has truth in itself. Considering the pattern of resource endowments in Central Java, however, we are inclined to think that there has to be some measures by which even the existing traditional technology can be made as economical and as productive as modern factory system technology. This is why we conceive the gap between the number of registered establishments and that of actually operating establishments as an evidence of excess capacity in manufacturing industry in Central Java. We will discuss this point in a later section.

6.3.6 Geographic Structure of the Industrial Sector

06.023 A geographic distribution of industrial establishments and their employment seems to disclose an interesting pattern of industrial development in Central Java (see Table 6.5). Generally speaking, the northern plain belt along with the national highway and railroad stretching in the eastwest direction, and Surakarta-Klaten areas, are relatively more industrially developed than other areas in Central Java, while the southern coastal plain, except Cilacap, and eastwest stretch of central mountain areas are less industrially developed.

06.024 According to Data Dinas Perindustrian Jawa Tengah 1972, 6 areas, namely KDY Semarang, KDY Pekalongan, KB Pekalongan, KB Kudus, KDY Surakarta and KB Klaten, employed 64 percent of total employment in large scale industries. If we add KB Sukoharjo to these 6 areas, a total of 7 areas out of 35 kotamadyas and kabupatens in the Province employed 63 percent of the total employment of medium scale industries. According to Data Dinas Perindustrian Jawa Tengah 1975/76 there were 8 areas where industrial employment in each area exceeded 10,000 persons. Those were KDY Surakarta, KDY Pekalongan, KDY Tegal, KB Klaten, KB Kudus, KB Sukoharjo, KB Batang, KB Pekalongan and KB Tegal. As we will see later, over 80 percent of domestic investment in Central Java during 1969 to 1974 was concentrated to the Semarang, Pekalongan, Tegal, Kudus, and Surakarta areas.

Table 6.5 Numbers of Industrial Establishments and Employment[1/] by Kotamadya and Kabupaten

	1975/76 (L + M + S)		1976 (S + H)	
	Establishment	Employment	Establishment	Employment
1. KDY Magelang	230	2,302	110	290
2. KDY Surakarta	588	14,893	424	2,791
3. KDY Salatiga	72	2,444	173	295
4. KDY Semarang	419	14,487	677	1,448
5. KDY Pekalongan	227	9,273	345	3,813
6. KDY Tegal	511	10,604	474	1,393
7. KB Cilacap	276	4,973	6,712	12,608
8. KB Banyumas	582	3,939	7,400	17,090
9. KB Purbalingga	358	3,430	7,015	16,567
10. KB Banjarnegara	227	1,235	6,313	18,717
11. KB Kebumen	201	4,757	33,069	124,388
12. KB Purworejo	153	1,914	5,788	7,579
13. KB Wonosobo	222	1,720	1,874	3,618
14. KB Magelang	407	4,360	2,662	7,409
15. KB Boyolali	550	2,844	1,648	5,607
16. KB Klaten	1,714	13,667	1,275	4,811
17. KB Sukoharjo	302	2,612	1,052	5,729
18. KB Wonogiri	195	4,292	4,250	10,193
19. KB Karanganyar	166	1,138	5,864	8,472
20. KB Sragen	7,555	11,453	16,357	17,344
21. KB Grobogan	170	1,360	4,756	7,155
22. KB Blora	200	997	2,186	4,309
23. KB Rembang	149	1,829	3,347	8,908
24. KB Pati	185	2,742	1,630	8,112
25. KB Kudus	414	41,721	605	1,655
26. KB Jepara	92	2,401	2,616	11,813
27. KB Demak	204	1,991	997	3,537
28. KB Semarang	86	1,677	1,091	2,801
29. KB Temanggung	543	1,804	1,851	4,428
30. KB Kendal	143	1,794	1,066	3,151
31. KB Batang	213	11,687	3,247	9,942
32. KB Pekalongan	801	15,433	485	3,704
33. KB Pemalang	497	4,914	6,457	12,731
34. KB Tegal	486	10,604	516	1,883
35. KB Brebes	632	2,719	1,159	3,696
Total	19,770	220,010	135,391	357,987

Note: 1/ L indicates large, M indicates medium, S indicates small and H indicates handicraft industries.

Source: 1. For 1975/76, Data Dinas Perindustrian Jawa Tengah 1975/76.
2. For 1976, Inventarisasi Industri Kecil an Kerajinan, Jawa Tengah, 1976.

06.025 It appears from the analysis of industrial locations in Central Java in the previous section that the northern coast through Tegal, Pekalongan and Semarang along with the national highway and the national railroad is more developed, industrially, than the southern coast through Cilacap to Yogyakarta. At the same time, a number of industrially developed areas exist along with the national highways Semarang-Salatiga-Surakarta-Klaten-Yogyakarta and Semarang-Magelang-Yogyakarta, and along with the provincial highway Semarang-Kudus.

06.026 What could be a patterns of industrial location in Central Java in the future? It is interesting to note that even in the northern coast, the development of the industrial sector has taken place mainly in three areas: namely Semarang, Pekalongan and Tegal. This stepping-stone type of industrial locations in the northern coast seem to have been more clear since Repelita I, and is likely to continue in the future, although each growth center will extend to neighboring areas. On the other hand, accelerated economic integration of Yogyakarta to the economy of Central Java will probably strengthen the present position of Surakarta-Klaten areas as one of the major growth centers in Central Java. Meanwhile, Kudus will maintain its uniqueness as a major center of production in tobacco and printing industry in Central Java. Future development of Cilacap areas will create a new pattern of industrial locations in Central Java. If Cilacap can be developed as a center of basic and chemical industries, a northsouth geographical link between Tegal and Cilacap through Purbalingga, and a eastwest link of Cilacap-Kebumen-Yogyakarta-Klaten-Surakarta may have pronounced impacts in development of industries.

6.3.7 Household and Cottage Industries

06.027 Central Java Province is characterized by the large number of small manufacturing units[5/] defined as household and cottage industries. The 1974/75 Industrial Census was particularly designed to collect information regarding those units of manufacturer which have less than 4 persons engaged in production, during August 1974 to July 1975 (see Table 6.6). According to the Census, there were a total of 1,235,000 units of household and cottage industries in Indonesia. 92 percent of them employed unpaid family workers only, while 8 percent hired paid workers. The number of household and cottage industrial units in Central Java was 521,000 or 42 percent of the total number of household and cottage industrial units in Indonesia as a whole. Considering Java Island, 55 percent of units and 54 percent of persons engaged in household and cottage industries were located in Central Java. The total number of persons engaged

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5/ Units means "small manufacturing enterprises".

Table 6.6 Number of Units[1/] and Persons Engaged in Household and Cottage Industries by Branches of Industry, Indonesia

1974 / 1975

(Unit: Thousands)

Branches of Industry	No. of Units[1/]		No. of Workers	
	Total	% of Units With Hired Paid Workers	Total	% of Hired Paid Workers
Food (311 & 312)	429.3	10.2	1,380.7	5.6
Beverage (313)	1.7	8.8	5.5	4.8
Tobacco (314)	3.4	53.8	15.0	25.3
Textile (321)	129.4	3.2	398.9	2.1
Wearing Apparel (322)	7.6	17.8	26.3	10.0
Leather (323)	1.0	58.0	4.2	29.0
Foot Wear except Plastic (324)	1.5	47.0	5.8	24.0
Wood & Wood Products (331)	502.1	2.1	1,536.4	1.1
Furniture except Metal (332)	32.8	22.0	107.6	12.2
Paper & Paper Products (341)	1.5	10.2	5.1	7.6
Printing & Publishing (342)	1.1	51.4	4.3	28.6
Basic Chemical (351)	-	-	-	-
Other Chemicals (352)	2.0	48.2	8.0	26.2
Misc. Products of Petroleum & Coal (354)	-	-	-	-
Rubber (355)	1.5	55.7	6.3	29.3
Plastic Wares (356)	1.8	29.0	6.7	17.0
Pottery, China & Wares (361)	21.0	3.1	61.5	1.7
Glass & Glass Product (362)	-	-	-	-
Cement, Lime & Cement Product (363)	4.5	55.3	18.9	25.6
Structural Clay Product (364)	49.8	23.6	166.1	13.5
Other Non Metalic Mineral (369)	5.2	6.6	16.6	5.8
Non Ferous Metal Basic Ind. (372)	-	-	-	-
Fabricated Metal Product (381)	-	-	-	-
Machinery except Electrical (382)	13.6	38.2	49.5	19.7
Electrical Mach. & Appliances (383)	-	-	-	-
Transport Equipment (384)	1.8	18.6	6.2	10.9
Measuring & Controlling (385)	-	-	-	-
Other mfg. Industries (390)	20.3	8.4	64.9	5.0
Not Specified	1.4	55.9	5.2	31.2
Total	1,234.5	7.9	3,899.9	4.5
% of (Food + Textiles + Wood) in Total (%)	85.9	-	85.0	-

Note: 1/ Units means "small enterprises".

Source: BPS, Sensus Industri 1974/75, Household and Cottage Industries, Table 21.

in household and cottage industries in Central Java was 1,633,000 persons. According to the Census and Statistical Office of Central Java, 234,513 persons were employed in manufacturing establishments, including even small scale establishments, in 1974 in Central Java.[6] Therefore the number of persons engaged in household and cottage industries in 1974 was nearly 7 times more than the number of employment in Central Java in 1974.[7]

06.028 The average number of persons employed per household and cottage industrial unit was 3 persons. 97 percent of all workers in those industries were unpaid family workers. At establishments which hired paid workers, on the average two workers were hired. The average number of man-days worked at each unit was 119 days for those units which employ family workers only, and 431 man-days at those units which hired paid workers in Central Java. Comparing to other provinces in Java Island, the following points have to be mentioned. First, the proportion of units with family workers only was highest in Central Java. Second, the number of man-days worked by family workers was largest in Central Java. Third, the average number of man-days worked by hired workers in Central Java was 250 man-days, next to 362 man-days in Jakarta.[8]

06.029 An inquiry of participation by family workers in production also reveals an interesting point. The proportion of full-time participants among the family workers was 48 percent in Central Java as compared to 69 percent in Jakarta, 59 percent in East Java, and 55 percent in West Java. This implies that a relatively larger number of family workers in Central Java committed themselves to productive activities only on a basis of part-time participation.[9]

06.030 Judging from those findings, we may say that the productive activities of household and cottage industries in Central Java probably are primarily in the nature of supplementary income earnings to other gainful activities, particularly to farming. In view of small size of peasant farms holdings in Central Java, any amount of supplementary income to farm incomes should be quite important to peasants' households.

6/ Jawa Tengah Dalam Anglea 1973-1975, Table 7-1.

7/ Census Industri 1974/75 SI-76-01, Household and Cottage Industries Vol. 1, 1976, Table 1.1.

8/ Ibid., Table 1-2 & Table 1-3.

9/ Ibid., Table 1-5.

06.031 A comparison of value added per unit and per man-day worked reveals a striking difference. The value added per unit in Central Java was as low as Rp.44,000 as compared to Rp.320,000 in Jakarta, and nearly Rp.73,000 to 75,000 in East and West Java. The value added per man-day worked in Central Java was extremely low in comparison to that of other provinces: Rp.113 in Central Java, Rp.177 in East Java, Rp.238 in West Java, and Rp.688 in Jakarta.[10/] The above figures of value added per man-day do not distinguish between family workers and hired employees. However, they are useful in gaining an understanding of the nature of operations of household and cottage industrial units. Jakarta being only one exception, the value added per man-day in other provinces was lower than daily wages paid to hired workers.

06.032 Taking the national average, the value added per man-day was Rp.197 while the average wage paid to hired workers was Rp.255 a day. In Central Java, the average valued added per man-day was Rp.113 as compared to the average wage for hired workers which was Rp.178. This may well imply that household and cottage industries can survive only when they mobilize idle family workers for supplementary income earnings. In a sense, this should be considered as a typical behavior of small peasant's households which have to strive to exploit every income generating opportunitiy which can be found outside farming.[11/]

06.033 Although the industrial breakdown of the household and cottage industries is available only for the national level, still it gives insight for our understanding the nature of these industries. 86 percent of units and 85 percent of persons engaged in the household and cottage industries are found in three manufacturing industries: food processing, textile product manufacturing, and wood and related industries. If we include pottery, china and wares manufacturing, and structural clay product manufacturing to those three industries, 92 percent of all the units in the household and cottage industries are found in those branches of productive activities.[12/] What seems to be important is the fact that it is those industries which tend to generate less value added than daily wages paid to hired workers. On the other hand, there are a number of manufacturing activities which create larger value added than wages paid to hired workers. For example, plastic wares, leather and related products, other chemicals, footwear (excluding plastic), fabricated metal products, and others (see Table 6.7) can be cited as such branches of manufacturing activities.

10/ Ibid., Table 1-3 & Table 1-8.

11/ Ibid., Table 1-3 & Table 1-8.

12/ Ibid., Table 2-1.

Table 6.7 Wages and Value Added per Man-Day by Industry in Household and Cottage Industries, 1974/75

(Unit: Rp.)

Industry	Wages	Value Added	Differences	% of Units to Total 1/
Food (311 & 312)	226	196	-30	35
Beverage (313)	245	438	195	
Tobacco (314)	469	590	121	
Textile (321)	146	137	-9	11
Wearing Apparel (322)	278	489	211	
Leather (323)	236	511	275	
Foot Wear except Plastic (324)	405	704	299	
Wood & Wood Products (331)	343	125	-218	41
Furniture except Metal (332)	300	391	91	3
Paper & Paper Products (341)	370	362	-8	
Printing & Publishing (342)	230	450	220	
Other Chemical (352)	289	610	321	
Rubber (355)	210	424	214	
Plastic Wares (356)	259	584	325	
Pottery, China & Wares (361)	191	112	-79	2
Cement, Lime & Cement Products (363)	286	483	197	
Structural Clay Products (364)	255	322	67	4
Other Non Metalic Mineral (369)	169	207	38	
Fabricated Metal Products (381)	264	432	168	
Transport Equipment (384)	318	773	455	
Other Mfg. Industries (390)	224	243	19	2
Average	255	192	-63	98

Note: 1/ See Table 6.6.

Source: BPS, Sensus Industri 1974/75, Household & Cottage Industries, Tables 2.3 and 2.8

06.034 What sorts of policy implications can we draw from these findings? Although we must avoid over-generalization, we may still be able to say that most of the productive units in the household and cottage industries can survive only by utilizing unpaid family workers. However small the earnings from those productive activities may be, they still constitute an important part of supplementary incomes to the extremely low farm incomes of rural families. It is for this reason that we believe that an increase in earning capacity of family units engaged in the household and cottage industries should be given a high priority in a search of strategies and policies for industrial development in Central Java.

06.035 In this regard, it seems to us most crucial to improve the distribution system related to the household and cottage industries. Most of the productive activities, though there are some exceptions, are in the nature of processing "purchased" raw materials for final products. Hand weaving, for example, is done by use of purchased raw yarns. Woodworkers make furniture from purchased lumber. Even "tahu" and "tempe" manufacturers have to buy soybeans as raw materials. In the cases of manufacturing plastic wares and leather products, and fabricated metal products, all the units engaged in production have to obtain processing materials from suppliers. Therefore, the earnings of primary producers in the household and cottage industries should be conceived of as "processing margins", which are primarily determined by the prices of raw materials and of processed outputs. Here we recognize the role of middlemen who function as suppliers of raw materials and buyers of processed goods.

06.036 Generally speaking, the middlemen have been thought of as those exploiting primary manufacturers. This may be true in many cases. On the other hand, they also function as an intermediary between potential producers and potential markets: unless middlemen supply raw materials, rural families can not work for earning supplementary incomes. Future prospects of the household and cottage industries, therefore, depend greatly on the nature of middlemen's activities. Our casual observation convinces us that there is an urgent need to improve relationships between middlemen and primary producers in the household and cottage industries in Central Java.

06.037 Three measures may be mentioned for effective mobilization of middlemen in order that rural families engaged in the household and cottage industries can earn higher processing margins. First, primary producers may be directed to organize primary producers' cooperatives which will take over the function of intermediaries from middlemen. This approach has already tried out under BIPIK (Industrial Extension Services), though the achievement seems to include problems as well as benefits. The Study team was told at the Provincial Office of BIPIK that once a cooperative had been organized, then all the activities for giving guidance and supervisions to it are transferred to other government machinery in charge of promoting cooperatives. In other words, officers in charge of BIPIK tend to take roles as organizers of cooperatives but not as promotors of its activities.

In order to develop primary producers' cooperatives as a sort of middleman in the distribution system, BIPIK ought to continue its involvement in the cooperatives' management.

06.038 Second, it should be useful to encourage establishment of collecting depots at the level of the Desa. At present, the bargaining between primary producers and middlemen is carried out individually. However, if an administrative authority at the desa level establishes a collecting depot where both purchasing of raw materials and selling of processed goods are centrally managed, present practice of individual and direct negotiations between primary producers and middlemen can be eliminated. This approach should be possible for certain products, like handwoven goods, clay products, and bamboo handicrafts. Depending on the quantity of products gathered at each collecting depot, direct delivery to consuming areas or wholesale dealers at towns will also be made possible so that commissions earned by a number of intermediaries can be retained by primary producers. This however may depend largely upon the organizational capacity of desa level administrations. And yet we believe that this approach should be tried out at least as a pilot scheme for testing effectiveness and for finding possibilities of improving effectiveness.

06.039 Third, it may be difficult in the light of prevailing national sentiment against middlemen of Chinese descent to make best use of their experiences and skills in order to expand markets for products of the household and cottage industries. Although our observation in the field is clearly limited, we happened to find in many cases that it is those persons who are most active in playing a role of middlemen. For example, some Chinese middlemen visit primary producers' workshops every week, to supply raw materials and collect processed goods. It is indispensable indeed at least in the short run to rely on their services as middlemen. It appears to us that an introduction of systematic putting-out system for the household and cottage industries is crucial for mobilizing idle hours of rural labor force and urban underemployed workers. At this moment, the practice of the putting-out system has been mostly carried out by Chinese middlemen. If we can combine two approaches mentioned above with the putting-out system carried out by Chinese middlemen, it should be possible to eliminate unjustifiable exploitation by them. On the other hand, if it is made difficult for them to function in their roles as middlemen, at the present, we feel that some parts of the household and cottage industries may encounter considerable difficulty in marketing their products.

06.040 Finally, we believe that it is most important to introduce "high value added" producing activities to the household and cottage industries in Central Java. However, as shown in Table 6.7, those high value added producing activities are by and large in the non-traditional area. Processing of plastic wares, for example, should be considered as non-traditional in the household and cottage industries in Central Java. However, as we will discuss later, the industrial

extension services for the household and cottage industries in Central Java tend to concentrate their activities on more traditional lines of productive activities, which are marked by low value added.

6.3.8 Trends of Industrial Investment Projects in Central Java

06.041 Since the beginning of Repelita I, a considerable number of investment projects took place in Central Java. However, our close examination of the statistical information regarding investment projects in Central Java appears to reveal some problems. In any case, here again we found that the official statistics available at Perindustrial Jawa Tengah contain, apparently, some inconsistencies. Nevertheless, the following points deserve particular attention.

06.042 First, the number of investment applications to BKPM-D/BKPM-S (Investment Coordinating Board of the Province/National Investment Coordinating Board) has increased markedly since 1970. The number of domestic investment applications increased from 21 cases with a value of Rp.6,566 million in 1969 to 53 cases with a value of Rp.72,045 million in 1975. Applications for foreign investments also rose, from only 2 cases (US$ 1.9 million) in 1968 to 11 cases (US$ 104.8 million) in 1975 (see Table 6.8). Nearly 80 percent or more of the total investment projects intended were related to the industrial sector in the Province.

06.043 Second, however, the number of realized investment projects tended to fall during 1970 to 1974, while the value of realized investment projects rose considerably. Let us assume that it makes a decisive difference in obtaining bank loans, which make investment applications be realized as actual investments, to receive recommendations from BKPM-D/BKPM-S. And also we assume that those investment projects which received recommendations from them were mostly realized. The number of domestic investment projects which could receive recommendations from BKPM-D/BKPM-S was usually less than half the number of investment project applications, and it had continuously declined, from 28 projects in 1970 to 10 projects in 1974. On the other hand, the value of recommended investment projects rose rapidly from Rp.4,564 million in 1969 to Rp.25,421 million in 1970. The average value of realized investment projects thus increased from Rp.211 million in 1970 to roughly Rp.1,500 million in 1974. An inference from the above findings may well be that BKPM might have given more favor to larger investment projects in deciding recommendations, and this may partly explain a decline in a number of realized investment projects (see Table 6.9).

06.044 The ratio of the value of recommended investment projects in a total value of intended investment projects dropped from 41 percent in 1969 to only 10 percent in 1972 and then turned to rise to 27 percent in 1975. On the other hand, the number of investment applications to BKPM remained on the order of 40 to 50 cases a year. One may thus wonder why this ratio remained at relatively low levels.

Table 6.8 Number and Value of Investment Applications in Central Java by Sources of Investment 1968 to 1975

Year	Foreign Investment (P.M.A.)		Domestic Investment (P.M.D.N.)	
	Number	Value (US $ Million)	Number	Value (Rp. Million)
1968	2	1.8	-	-
1969	4	2.0	21	6,566
1970	6	2.3	40	8,966
1971	4	12.8	40	13,381
1972	4	26.8	51	47,478
1973	6	31.7	47	31,443
1974	8	168.8	49	61,417
1975	11	104.8	53	72,045
Total	45	350.0	301	241,396

Source: Perkembangan dan Permasalahan Aneka Industri dan Kerajinan di Jawa Tengah 1975/1976, P.9.

Table 6.9 Domestic Investments (P.M.D.N.) in Central Java, 1969-1975

Year	No. of Applications	No. of Projects Started Production or to Start Production	Recommended by P.M.D.N. (Rp. Mil.)	Under Constideration by P.M.D.N. (Rp. Mil.)
1969	21	18	4,564	6,566
1970	40	28	5,916	8,965
1971	40	24	6,916	13,481
1972	51	20	4,813	47,478
1973	47	13	8,457	31,443
1974	49	10	14,994	61,417
1975	53	25	25,421	72,045

Source: Perkembangan dan Permasalahan Aneka Industri dan Kerajinan di Jawa Tengah, 1975/76, Appendix figures.

We found some interesting facts in our analysis of 85 realized investment projects in the industrial sector for which we can obtain information regarding year of application, value of intended investment, year of realization, and a value of realized actual investment. About three-quarters of the realized investment projects were new projects while a quarter were expansion projects, mostly in food and beverage, and tobacco manufacturing industries. On the average, it took one to two years to realize investment project applications. The value of realized actual investment tends to be much smaller than a value of intended investment; in some cases it was nearly half of the intended value. A number of investment applications which were made in the early 1970s remain on the record, but they may have already been given up by applicants.[13/]

06.045 Three points can be raised on the basis of the above findings. First, investment applicants to BKPM might have tended to prepare unrealistic investment projects, particularly in terms of their initial capital outlay. Second, thus, it might take a much longer time at BKPM to process investment applications before it makes a decision regarding recommendation. On the other hand, BKPM itself, probably both at Provincial and National levels, could speed up its handling of investment application. Third, BKPM might have given lesser priority to applications smaller in value and larger in number.

06.046 Let us turn our attention to foreign investments. From 1968 to 1975 Central Java received a total of 45 applications with a total value of US$ 351 million from foreign investors. 80 percent of the applied projects were for the industrial sector while 11 percent were for the agricultural sector, the remaining parts equally divided among the construction and timber industries. Considering the number of and value of foreign investments in Java Island as a whole, Central Java received a very small share of foreign investments: only 4 percent of the number of projects and 6 percent of their total value. It appears that the Central Government has taken steps to cha ge this tendency, in order to increase foreign investment in Central Java. For example, the number of foreign investments recently made in Central Java was due to advice given by BKPM-S to select locations in Central Java. Some industrial investors chose Central Java from the beginning of investment planning, since competitive foreign investments have already been made in Jakarta and Surabaya. As a reflection of those, the number of foreign investment applications in Central Java has recently risen (4 in 1971 and 1972, 5 in 1973, 7 in 1974 and 11 in 1975), as has the value of planned investment (from US$ 13 million in 1971 to US$ 105 million in 1975; see Table 6.10). Since the reason for the relative reluctance of foreign investors to invest in Central Java is related to poor infrastructure particularly of port facilities in the Province,

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13/ Data Dinas Perindustrian, 1975/76, p.52 - 74.

Table 6.10 Foreign Investment in Central Java, 1968 to 1975

Year	No. of Applications	No. of Projects to Start Production	Value of Planned Investment (US$ Million)	Value of Investment Recommended by President (US$ Thousand)
1968	1	-	1.50	-
1969	4	3	2.00	1.95
1970	6	-	2.30	-
1971	4	2	12.75	8.50
1972	4	2	26.78	2.98
1973	5	1	30.36	2.80
1974	7	3	166.35	95.15
1975	11	-	104.81	-

Source: Perkembangan dan Permasalahan Aneka Industri dan Kerajinan di Jawa Tengah, 1975/76, Appendix Figures.

we consider it the most crucial that improvements of harbor facilities at Semarang, as a short-run measure, and the preparation of an implementable master plan for Cilacap Industrial Development Program as a long-run measure have to be given high priority.

06.047 Table 6.11 shows an breakdown by industry of investment projects which have been realized. In terms of number of projects, 58 percent is in light industries excluding textile industries, 31 percent is in textile industries and 10 percent is in basic industries; in terms of the value of investments, 45 percent is in light industries excluding textiles, 47 percent is in textile industries and 8 percent is in basic industries. Looking at trends of industrial investments by sectors, the number of investment projects in the textile industry increased from 2 in 1968 to 17 in 1970 and then continuously declined, to 5 in 1975. The value of investments in textile industry, however, consistently increased during the period concerned. This implies that the scale of investment per project in the textile industry has significantly risen. In other words, a smaller number of larger scale of investment projects has been characteristic in the textile industry in Central Java. Both light and basic industries, on the other hand, increased both in numbers and in values of investment projects.

06.048 The locations of investment projects actually invested during 1969 to 1974 clearly indicate that "growth" center like Semarang, Surakarta, Pekalongan were more favored by investors, thus accelerating their growth more favorably than other areas. Nearly 49 percent of the total domestic investments were concentrated in Semarang alone, and 81 percent of all projects took place only in 5 areas, namely, Semarang, Surakarta, Pekalongan, Kudus and Tegal. In the cases of foreign investments, however, 11 out of 25 projects were in Semarang, while Cilacap attracted 5 projects, and Surakarta received 3 projects. Those concentrations of investment projects to certain areas ought to be taken into account for identifying development strategies for the future of Central Java (see Table 6.12).

6.3.9 Cilacap Industrial Development Project: Potentials, Constraints and Prospects

06.049 Cilacap has a decisive advantage of being the largest and best sea port in Central Java, and in the southern shores of Java Island as a whole. The water depth of 9.5 meters at present makes it possible to provide direct access to harbor by a cargo ship of 15,000 DWT (deadweight tons). If the water depth is deepened by dredging to 13 to 14 meters, a 50,000 DWT ship with draft line of 11.8 meters can make port, and in case of 16 meters, a 100,000 DWT tanker can have direct access to the harbor. This potential must be compared to ports in the northern shores of Central Java. None of Tegal, Pekalongan, and Semarang can at present provide direct access to harbor to any cargo ship which is larger than 2,000 DWT.

Table 6.11 Number and Value[1/] of Industrial Investment by Major Sector in Central Java, 1968 to 1974

(Unit: Rp. Million)

Year	Light Industry		Textile		Basic Industry		Total	
	No.	Value	No.	Value	No.	Value	No.	Value
1968	-	-	2	1,560	-	-	2	1,560
1969	7	1,252	13	3,472	1	14	21	4,739
1970	19	4,611	17	4,926	1	410	37	9,974
1971	19	2,475	14	4,672	3	816	36	7,963
1972	20	7,977	7	6,710	2	765	29	15,471
1973	28	8,629	6	15,782	8	5,906	42	30,317
1974	25	26,045	5	16,962	5	1,480	35	44,487
Total	118	50,989	64	54,130	20	9,391	202	114,487

Note: 1/ Includes both domestic and foreign investments.

Source: Perkembangan dan Permasalahan Perindustrian Propinsi Jawa Tengah, 1974/75, Laporan Tahunan, P. 25.

Table 6.12 Location of Major Private Investment

Central Java, 1969 to 1974

Kotamadya a Kabupaten Center	Domestic		Foreign		Total[1/]
	No. of Projects	Capital (Rp. Mil.)	No. of Projects	Capital (US$ Thousand)	(Rp. Mil.)
Semarang	121	66,280.7	11	44,289.7	84,665.2
Kendal	3	1,418.5	1	1,400.0	1,999.5
Batang	4	2,168.3	1	7,000.0	5,073.3
Pekalongan	18	14,793.0	-	-	14,793.0
Pemalang	2	2,726.3	-	-	2,726.3
Tegal	10	2,406.3	-	-	2,406.3
Brebes	1	50.0	-	-	50.0
Demak	1	150.0	-	-	150.0
Kudus	13	4,961.5	-	-	4,961.5
Jepara	1	26.1	-	-	26.1
Pati	1	250.0	-	-	250.0
Cepu	1	38.0	-	-	38.0
Purwodadi	1	500.0	-	-	500.0
Salatiga	4	1,768.0	1	13,745.0	7,453.5
Surakarta	40	47,714.9	3	11,300.0	52,404.4
Klaten	2	455.0	-	-	455.0
Wonogiri	1	90.0	-	-	90.0
Magelang	3	197.0	-	-	197.0
Purworejo	1	15,000.0	-	-	15,000.0
Wonosobo	1	1,650.0	-	-	1,650.0
Banjarnegara	1	582.0	-	-	582.0
Banyumas	1	1,000.0	1	500.0	1,207.5
Purwokerto	1	700.3	-	-	700.3
Cilacap	4	4,424.7	5	150,700.0	66,965.2
Total	248	169,350.6	25	239,684.7	268,826.1

Note: 1/ Foreign investments are converted into Rupiahs at the rate of Rp.415 a dollar.

Source: BKPM Daerah TK.I Jateng, Laporan B.K.P.M. Daerah TK.I Tengah 1974, Semarang.

06.050 Cilacap also is linked to the rest of the major development poles by railway lines and by main roads. It is connected to railway lines linking Jakarta-Bandung-Yogyakarta-Surabaya and Purwokerto-Cirebon-Jakarta by a spur line from Kesugihan; a point some 19 km to the northeast of the town of Cilacap. Main roads networks pass through Cilacap to all directions; Cilacap-Yogyakarta-Surabaya, Cilacap-Tegal-Semarang, Cilacap-Tegal-Jakarta , and Cilacap-Bandung-Jakarta . In view of the widespread and transport linkages to the rest of the Island, and also in view of the fact that the harbor facilities at Tanjung Priok (Jakarta) and Surabaya harbors may sooner or later face at problems of congestion, the significance of Cilacap harbor will increase not only as a distribution center to Java Island of imported goods and transferred goods from outer islands, but also as the site for heavy industries which require access to large cargo ships.

06.051 At the present, there are already nearly a dozen modern industries in Cilacap: Pertamina oil refinery, a large cement factory with a capacity of 500,000 tons per year, two pelletizing factories, a seafood cold storage, a cotton spinning mill, a coconut oil factory, fertilizer bagging plant and pipeline fabrication plant.

06.052 In addition, Cilacap Industrial Estate has already completed its first phase, which covers 75 ha. The second phase will prepare 55 ha of land, and the third phase will provide 110 ha for industrial investment. The first phase land preparation can provide 6 sites each with 4 to 5 ha to large industries, and nearly 40 sites with a minimum of 50 sq. m to 250 sq. m for small and light industries, and minimum of 1,000 sq. m to light and medium scale industries. BKPM-D (Investment Coordination Board of the Province) has already recieved 17 applications for the Industrial Estate as of 14 December 1976.

(a) Constraints on Cilacap Development

06.053 In despite of the significant potential and the development hitherto achieved in Cilacap, its future for creating an industrial complex appears to be rather limited at least for the short-run. In this regard, it is necessary to examine carefully constraints, the removal of which is an indispensable prerequisite for the further development of Cilacap as a major industrial area in Central Java. We shall examine major constraints.

(i) Electric Power

06.054 Cilacap Industrial Estate will not have any electic supply for industries until at least late 1978 when electric current distributor from P.L.T.A. Ketenger, Purwokerto with capacity of 20 MW will possibly have been constructed. If planned construction of P.L.T.G. with capacity of 2 x 20 MW and P.L.T.U. with capacity of 2 x 55 MW can be finished in 1980 as projected, the Cilacap industrial area as a whole may be able to meet its demand for electricity. In short, as far

as the supply of industrial electricity is concerned, not only the Industrial Estate but also the Cilacap area as a whole are unable to attract potential investors in the near future. This fact bears an important implication for medium and small industries whose capability may not permit installation of their own generating equipment.

(ii) Water Supply

06.055 The Industrial Estate can supply water at a rate of 84 m^3 per hour from 7 artesian wells. It is not certain if this quantity of water supply is sufficient for prospective industries. Water supply at a rate of a maximum of 2,088 m^3 per day (84 m^3 x 24) may well exclude a variety of industries. Taking examples from medium scale industries in Japan, fresh water consumption at a factory per day is nearly 3,500 m^3 in vegetable fats and oil, and starch manufacturing. If we consider medium scale plastic processing, its daily consumption of industrial water is as much as 5,500 m^3, and a small petrochemical complex alone will consume 41,000 m^3 per day. In view of the large discrepancy between the capacity of water supply and potential demand for it, it appears to be inevitable to reconsider the current water supply program for the Industrial Estate. If we think of a large industrial development outside the Estate, the problem of water supply will be one of serious bottlenecks.

(iii) Access to Raw Materials

06.056 Cilacap does not enjoy easy access to industrial raw materials, except limestone used for cement production. Even such agro-industries like coconut oil manufacturing seems to have been suffering from irregular and low quantity of supply of raw materials. Cold storage at Cilacap depends on the supply from Sumatra. Iron sand may be rich, but other raw materials for the manufacture of iron and steel are not available at all. Indonesia has rich mineral resources, mostly in outer islands, but those resources have to be shipped to the southern coastal navigation routes. Unless efficient navigation and ocean-going shipping can be arranged between Cilacap and resource-rich outer islands, it will be difficult for Cilacap to get industrial raw materials.

(iv) Infrastructure of Land Transportation

06.057 As mentioned, Cilacap has extensive land transportation links to the rest of Java, by railways and by roads. However, without improvement and rehabilitation of railways and roads, they can hardly function in the roles of infrastructure in its true sense. The upgrading of the Bandung - Yogyakarta road and Cilacap spur road has been undertaken to achieve the standard of a 6 meter width carriageway capable of taking maximum axle loadings of 5 metric tons. However, the rest of the roads connecting Cilacap to other areas are still mostly of Class III standard which can take only 3.5 tons of maximum axle load. Any road linkages which serves for market outlets of heavy industries must at least be of Class II standard with 5 ton maximum

axle load, and possibly of Class I which can withstand maximum axle load at 7 tons. The conditions of railways are deplorable both in their physical as well as managerial aspects. Unless they are substantially improved, railways can hardly be useful for industrial development.

(v) Geological Conditions

06.058 It is said that land at the Cilacap industrial area is extremely weak in its bearing strength -- i.e., ability to stably take a surface structure. According to explanation of a person working for the Cilacap Industrial Development Project, bearing force is assumed to be 4 tons per sq. meter at 2 meters under the surface. Probably because of this, a large quantity of piles were driven for the construction of oil tanks at the Pertamina oil refinery project. A structure for the petrochemical industry requires 60 tons per sq. meter bearing force, and 30 tons per sq. meter bearing force is required for a cement plant. This problem of bearing force of land, which might have been met by the construction of a cement factory and a oil refinery, must be carefully examined.

(vi) Port Facilities

06.059 According to information from the port authority, the improvement and rehabilitation of 4 major quays cost Rp.235 million besides aids of A$ 475 thousand for dredging up to 9.5 meters. During Repelita II, Rp.2,169 million besides aid of A$ 1 million is expected to be spent for rehabilitation of quays I, II, III and to build warehouses. Further development of industries in Cilacap will necessitate continuous investment in improvement of harbor facilities.

(b) Conclusion

06.060 The mere existence of a deep sea port alone does not guarantee industrial development, while it can help in development of an industrial complex if necessary infrastructure and institutional arrangements are systematically provided. The present situation of Cilacap Industrial Development Project may be a typical example of this truism. In a sense, the future of the Cilacap is exclusively and entirely dependent upon a degree of commitment to the project by the Central Government as well as the Provincial Government. In this sense, we propose that the Central and Provincial Governments join hands so that a realistic development master plan can be prepared and carried out.

06.061 In making such a comprehensive master plan for development, not only feasible introduction of phased investment in infrastructure and institutional arrangements, but also the kinds and size of industries of the industrial complex has to be determined by considering the complex's impact on the economy of Central Java as well as that of Indonesia as a whole. It may well be that in the light

of the huge cost involved in the Cilacap Industrial Development Project, that whether or not such a magnitude of investment is justifiable will be determined in relation to other pending industrial development projects like the improvement of Semarang Harbor which may have more direct short-run developmental impacts on the economy of Central Java. In conclusion, we are inclined to think of Cilacap Industrial Development Project as a long-run investment program which may well continue to Repelita IV.

6.4 Production Trends and Problems in Manufacturing Industries

6.4.1 Agro-Industries

06.062 The Investment Coordinating Board of the Province (BKPM-D) places high priority on developing agro-industries in the Province. It states in its memorandum issued on February 26, 1976 as follows:

> "Having a hinterland with an agricultural sector and an economic pattern of agrarian character, Central Java in its endeavors to boost investments has to focus its attention on those industries that processes agricultural, horticultural and fishery products."

Given this aim, and the need to reduce dependency on imports vegetable oil in the Province, the Governor of the Province recently banned exports of kapok seeds, a good raw material for vegetable oil. In spite of all the efforts to promote agro-industries in the Province, however, the prospects for the industry seems to be mixed as far as the present situation of the pattern of agricultural production and the structure of agro-industry in Central Java, are considered.

06.063 Let us begin with a review of production trends in various branches of food processing industries. Table 6.13 shows the quantity of production of various food processing industries during 1968 and 1975, and the structure of those industries by scale of establishments in 1974 (which is shown in the parentheses; numbers of large scale, medium scale and small scale, and a total number respectively in order). It appears that most food processing industries had made a remarkable increase in quantity of production during Repelita I, and some industries accelerated the rising trend during Repelita II.

06.064 On the other hand, the production of traditional consumers' goods like tahu, mie bihun, krupuk, noodle, palm sugar and dried fish showed either moderate rising trends or slight declines in quantity produced. Coconut oil, copra oil cake, and dried copra industries appear to have been meeting some problems in expansion of production.

Table 6.13 Productions of Food Processing Industry, 1968 to 1975

Industry	(Unit)	1968	1970	1972	1974	1975
Dried Meat (0+1+21=22) 1/	(tons)	2	58	175	1,504	1,827
Milk (0+2+28=30)	(Mil.liters)	0.7	2.6	2.4	0.9	0.8
Salted Fish (1+4+62=67)	(1,000 tons)	4	3	7	4	5
Coconut Oil (11+5+6=22)	(1,000 tons)	26	29	36	23	48
Groundnut Oil (0+1+19=20)	(Mil.liters)	2	2	5	63 (tons)	42 (tons)
Copra Oil Cake (11+5+6=22)	(Mil.tons)	1	1	3	-	2
Dried Copra (0+0+41=41)	(1,000 tons)	8	10	9	1	5
Salted Beans (1+14+12=27)	(1,000 tons)	0.9	1.3	1.0	2.1	2.3
Bread & Cakes (3+51+347=401)	(1,000 tons)	2.0	3.4	6.8	18.3	13.8
Biscuit (0+0+1=1)	(tons)	-	-	-	58	55
Bihun (Rice Noodle) (1+50+104=155)	(1,000 tons)	1.6	3.5	3.9	7.2	8.0
Noodle (0+8+67=75)	(1,000 tons)	3.5	3.0	5.6	2.9	2.3
Copra Sugar (1+0+131=132)	(tons)	14	13	160	1,088	11,821
Palm Sugar (0+0+495=495)	(1,000 tons)	0.3	0.2	1.1	0.1	0.9
Candies (8+18+39=65)	(1,000 tons)	1.7	3.1	5.0	8.6	75.2
Powdered Coffee (4+8+30=42)	(tons)	1.7	1.5	4.3	1,147.2	39,923.4
Tapioca Flour (12+6+238=256)	(tons)	1.2	112.0	236.0	4,707.2	11,149.2
Ketchup (2+5+145=152)	(1,000 tons)	915	1,250	1,524	-	-
Tahu (5+2+851=858)	(1,000 tons)	19	19	17	249	58
Krupuk (0+10+785=795)	(1,000 tons)	5	6	14	9	63
Tempe (0+0+441=441)	(1,000 tons)	1	1	39	-	-
Animal Feed (4+1+1=6)	(1,000 tons)	-	-	-	122	83
Tea (7+32+44=83)	(1,000 tons)	0.9	1.5	3.1	4.7	100.9
Vanilla (1+11+5=17)	(tons)	7.9	9.0	8.2	1,426	1,443

Note: 1/ Numbers of large-scale, medium-scale, small-scale, and total industries.

Sources: Data Perindustrian 1975/76; 1972, p.30; 1974, p.33; and 1975, p.12.

06.065 It seems that the production statistics of coconut oil have two different series in which the quantity produced differs by considerable extent. They are summarized in the following table.

Comparison of Coconut Oil Production Figures
Published by Dinas Perindustrian

(Unit: 1,000 tons)

Source	1970	1972	1974	1975
Annual Report 1975/76 Table 3	27	24	25	27
1972 Data, 1974 Data, 1975 Data	29	36	23	48

According to the Annual Report of Dinas Perindustrial Jawa Tengah, 27,000 tons were produced in 1975, while Data Dinasa Perindustrian 1975/76 gives 48,000 tons as the quantity produced in 1975. The original data used for compiling those industrial statistics must be the same and it is Dinas Perindusian Jawa Tengah which processed them for official publication. Thus, these discrepancies should not occur. In any case, coconut oil industry increased its capacity of production during Repelita I. During the Plan period, 3 new factories were built in Central Java.

06.066 The supply of copra, a raw material for coconut oil manufacture, did not increase to an extent corresponding to this expansion of capacity. A number of reasons can be cited for this. First, it is said that the consumption of coconut increased in rural communities, thus resulting in low levels of supply of copra, which is a product of coconut. Second, demand for copra must have increased in other industries like sugar and dried copra manufacturing. An additional 4 large-scale copra sugar manufacturing factories were built between 1972 and 1975, resulting in a sharp increase in the production of copra sugar (from 160 tons in 1972 to 1,088 tons in 1974, to 11,821 tons in 1975). On the other hand, the supply of copra from outer islands dropped because coconut oil factories were established in a number of outer islands. Probably because of these reasons, rates of capacity utilization in coconut oil factories are deplorably low in Central Java: barely 30 percent in 1975.

06.067 Tapioca flour manufacturing industry increased its production very rapidly (from 1.2 tons in 1968 to 236 tons in 1973, 4,707 tons in 1974, and 11,149 tons in 1975). The largest consumer of tapioca flour is the textile industry for its use of starching ("sizing") clothes.

However, increases in production of synthetic fiber cloth may decrease demand for tapioca flour starch in the future. In this regard, it seems to be necessary to develop other markets for tapioca flour.

06.068 Pelletizing industry also has grown in the Province since the latter years of Repelita I. This industry, however, began to have difficulty in obtaining raw materials, and the quantity of production dropped drastically from 1974 to 1975, (122,000 tons to 83,000 tons). Two pelletizing factories at Cilacap are operating at only 40 percent of capacity, one factory in Semarang closed down and another is about to be closed down.

06.069 The opposite production trends of the coconut oil industry vs. the copra sugar industry, and the tapioca flour industry vs. the pelletizing industry, may indicate a lack of coordination among different industrial investment projects which are competetive in their sources of raw materials. Both copra and coconut oil depend on coconut production while both tapioca and pelletizing industries depend on the supply of cassava. It would be natural to see that when one industry expands rapidly, another one depending on the same raw material may fail to keep its production at the level of installed capacity, resulting in low rates of capacity utilization. The expansion of production capacity among coconut oil, copra sugar, tapioca flour and pelletizing industries took place without considering competition in securing supplies of raw materials. In view of the apparent difficulty in rapidly expanding of coconut growing, any further investment in coconut oil and/or copra sugar production have to be discouraged. But in case of tapioca flour and pelletizing, we see room for expansion, provided that farmers will respond to rising demand for cassava by increasing production. Cassava is widely grown in the Province and it is easy to expand its production. There must be, however, improvement in the distribution system of cassava that provides incentives for growing cassava in larger quantities.

06.070 As mentioned, the Province aims at achieving self-sufficiency in supply of vegetable oil. For this purpose, groundnut and soybean can be used as raw material. The production of groundnut oil has been carried out for many years although the quantity produced did not rise to any significant extent, probably due to competition with coconut oil. However, the poor production facilities of groundnut oil mills may also have been limiting the expansion of production. Groundnut oil is mostly produced by small-scale establishments, and the average production was only 2 tons per establishment in 1975. If production equipment and machines can be improved, the capacity of production will increase, and result in larger demand for groundnut for which we see a good potential for farmers' response.

06.071 Soybean is widely grown and has long been used for production of tahu, tempe, ketchup. The trend of production of those soybean-based processed foods has been rising at much higher rates than population growth, implying that per capita consumption of soybean-based foods increased. Unless a drastic change takes place in the pattern of food consumption in the Province, soybean-based food processing industry will continue to grow. These industries are characterized by a large number of small-scale establishments scattered all over the Province. The markets for tahu and tempe, for example, are typically localized, and this fact may well mean that an improvement in earning capacities among the rural and urban families will bring about larger demand for those protein-rich foods. It thus may be better to assume that in the future also the traditional soybean-based food processing industries will absorb most of soybean produced in the Province, and that little may be left for soybean oil manufacturing.

06.072 However, we think that technological improvement in tahu manufacturing can contribute to expansion of use of soybean as raw materials for manufacture of both tahu and soybean oil. At the present, tahu manufacturing establishments, which are mostly in the nature of household or small-scale industry, discard large quantity of "okara", remnants after the soybean syrup is extracted. The quantity of by-product "okara" in tahu manufacturing is larger in non-mechanized establishments than in mechanized ones, which are dominant in the Province. "Okara" thus can be utilized as raw material for production of soybean oil, provided that a collecting system or agency can be established in the Province.

06.073 Other uses of "okara" may include livestock and poultry feed. The Study team found an extremely encouraging case of making good use of "okara" by a small-scale tahu producer. A tahu producer in KB Karanganyar raises a dozen of pigs by utilizing remnants of crushing soybean as feed, and made a contract with a Chinese middleman for sales of pigs. In this case, pig raising cost him nothing, but he was able to utilize his wastes in tahu manufacturing, and could accumulate sufficient capital to purchase a small machine for crushing soybean. This in turn made it possible for him to expand production of tahu and thus raising more pigs for sale. This case can be cited as a good example of making best use of Chinese middlemen for stimulating small scale industry in Central Java.

06.074 The above finding suggests that soybean oil production has good prospects if a workable system of utilizing the remnants of tahu manufacture can be established. On the other hand, however, new kinds of raw materials for vegetable oil production must be found in the Province. In this regard, we consider sunflower seeds to be important. It is said that research on sunflower oil production was conducted in the early 1960s and that it ascertained that sunflower oil production is uneconomical in the prevailing conditions at that time. It is regretted that the Study team was unable to obtain any report on this research. However, it may be true that during early

1960s when the supply of copra was so plentiful that the potential of sunflower oil production was not recognized. Also, it is true that the oil content of sunflower seeds grown in the Province might be low. However, as we will discuss in our recommendation, sunflower seed oil seems to provide good promise as an agro-based industry in the Province.

06.075 It would be sufficient here to point out advantages and disadvantages of utilizing four alternative sources of vegetable oil production: (1) Sunflower seed demands least land spaces compared to coconut, groundnut and soybean. (2) These other three plants have been used for multiple purposes; they are used for other food production like tahu, tempe, copra, copra sugar, and cake, while sunflower seed can be used only to produce oil (and possibly remnants after oil being extracted can be used as organic fertilizer and animal feed). Coconut, groundnut and soygean are selective in soil conditions while sunflower is least selective and can be grown anywhere. (3) The labor requirement for growing sunflower may be lowest among the four sources of vegetable oil manufacturing. Therefore, it would be quite advantageous to utilize coconut, groundnut and soybean to produce food products other than vegetable oil while sunflower seed is specifically used for vegetable oil production. (4) Finally, we are inclined to advocate a combination of soybean remnants after its syrup is extracted and sunflower seed as most promising raw materials for production of vegetable oil in the Province.

06.076 Finally, our observation tends to suggest that selective mechanization of production processes in most food processing industries can create larger employment potentials in the industry. For example, use of power for extracting soybean liquid in tahu manufacturing makes it possible to expand tahu production, resulting in a larger employment of labor in other activities, upstream and downstream, within the total production process of tahu manufacturing. Provision of a dryer for tempe manufacturing will eliminate seasonal fluctuation of tempe production. If simple drying equipment is used for an oven to dry tempe, manufacturers can continue their work even during the wet season. As seen in Table 6.3, most establishments in the food processing industry are small in scale and extremely poorly equipped, and in many cases they can not employ production technology any more labor-intensive than at the present. The fact that they are extremely poorly equipped tends to result in limiting working hours particularly due to the low capacity of one production process among many processes. Also, poor equipment tend to make it difficult to produce high quality goods and to practice quality control of products. Therefore, selective mechanization of many food processing industries has to be given a high priority.

6.4.2 Tobacco Manufacturing Industry

06.077 Tobacco manufacturing industry is one of the most important industries in terms of employment in the Province (see Table 6.14). Its 310 establishments employed nearly 49,000 workers in 1975. Over 80 percent of workers in tobacco industry were females, mostly employed in kretek tobacco manufacturing on a basis of piece-work wages. The production of kretek tobacco has been increasing since 1970, and was 1,501 millions packages (10 cigarettes each) with a value of Rp.129,602 millions in 1975. Reflecting the labor-intensive technology of production in the industry, the number of workers increased by 25 percent in six years. White cigarette (ordinary cigarette) production also increased from 202 millions packages (10 cigarettes each) in 1970 to 303 millions packages in 1975 with a value of Rp.14,095 millions in 1975. The number of persons employed in white cigarette manufacturing remained at the level of about 1,100 workers even though the number of establishments increased from 1 in 1970 to 3 in 1972. This indicates that capital-intensive technology is used in white cigarette manufacturing.

06.078 Since the method of labor-intensive production in kretek tobacco manufacturing provides us with a vivid example of how labor-intensive and capital-intensive technology can compete, it seems relevant to illustrate the process of production in kretek tobacco manufacturing.

06.079 At the first step, tobacco leaves are cut by use of simple machines, as the only mechanized step in the entire production process. Leaves are mixed with cloves manually. A group of 5 women working as an unit produces 12,000 cigarettes a day. A woman puts cigarette paper starched, two women roll cigarettes using simple wooden tools. A fourth woman ties cigarettes into bundles of 10 by means of a paper tape, and the fifth woman trims the ends of cigarettes to make the cigarettes standard size. The bundles are then brought to inspectors. After inspections cigarettes are sent to a second unit consisting of 3 women. One wraps 10 cigarettes in cellophane, and another woman puts it into a colorfully printed paper box and the third woman seals the box. The boxes are sent to the third group of women who wrap 20 boxes in a sheet of paper, and put them in a larger carton each of which contains 50 boxes. Finally they are sent to the shipping section where a male worker puts the cartons into larger containers.

06.080 The entire process of manufacturing is well organized in a sort of an assembly line, each unit encouraged to work hard by the incentive of the piece-work wage system. All the workers, young and old alike, are well trained to take their assigned tasks in the line of production. In this production system 3,000 workers can manufacture 10 million cigarettes per day. Depending on the conditions of market the factory observed by the Study team will increase its work force up to 4,000 workers without any additional capital costs. It was said that the Indonesian Government banned mechanization of

Table 6.14 Cigarette Industry, 1970 to 1975

	1970	1971	1972	1973	1974	1975
Kretek Cigarettes						
Prod. (Mil. Cigarettes)	11,589	12,440	11,975	13,183	13,280	15,013
No. of Establishments	75	58	54	63	58	58
No. of Workers (1,000 Persons)	24	21	20	23	28	31
Ordinary Cigarettes						
Prod. (Mil.Cigarettes)	2,027	2,744	2,577	3,041	3,751	3,034
No. of Establishments	1	1	3	3	3	3
No. of Workers (1,000 Persons)	1	1	1	1	1	1

Source: Dinas Perindustrian, Annual Report 1975/76, Table 3 &

production system in view of alleviating unemployment problems. In any case, the kretek cigarette industry is making optimum use of relatively cheap labor available in the area, and it gives concrete evidence that a massive mobilization of labor can compete with capital-intensive technology if it is properly managed by entrepreneurs with skillful organizational ability.

06.081 Kudus is one out of the largest kretek tobacco manufacturing centers of Java Island, second to Kadiri and Malang in East Java, and is the largest center in Central Java only followed by Surakarta. The concentration of kretek tobacco production in these two areas in Central Java is related to the availability of the supply of tobacco leaves which are produced in adjacent countryside. However, it depends on imported cloves whose prices tend to be one of the critical problems for further development of the kretek cigarette industry. Until a few years ago, the prices and quality of the supply of cloves were under a sort of the Government control. This control is no more operating, and the price of cloves is freely determined in the market. It appears, however, that this change made it easier for larger establishments, but more difficult for smaller establishments, to obtain cloves. Probably because of this, some smaller establishments might have been driven out of the industry. In 1975 there were 109 establishments licensed to manufacture kretek cigarettes, but 25 of them were not operating in 1975. In addition, we observed in Kudus that even of those establishments which are still engaged in production, some of them are operating at a low rate of capacity utilization -- probably only 2-3 hours of operation per day. It is not possible to generalize from our limited observation, but it appears that a extent of concentration of production to larger establishments has been increasing in recent years.

06.082 It must be noted that cigarette manufacturing in Kudus and to a lesser extent at Surakarta generated a pattern of linkage effects on other industries. Kudus is now is the largest center of the printing industry in Central Java. As we will discuss in the section on the printing industry, this was originally made possible by demand for manufacture of wrapping paper and packages for kretek cigarettes. In addition, a fleet of trucks for transportation of tobacco created a large demand for auto repair services. Even considering low wage earnings per workers the existence of a large concentration of wage earners in Kudus, and in Srakarta too, should have made significant impact on the tertiary industries in the area.

6.4.3 Textile Industry

06.083 Textile industry is one of three major industries in Central Java. According to the Annual Report of Dinas Perindustrian Jawa Tengah, 1975/76, there are 108 large-scale, 627 medium-scale and 7,884 small-scale establishments, or a total of 8,620 establishments with a total employment of over 78,000 persons. In addition, over 60,000 persons are engaged in household and cottage industries producing a variety of textile products (Inventarisasi, 1976).

06.084 The number of licensed establishments which employ mechanical power equipment in Central Java was only 172 in 1975, providing employment for nearly 31,000. Those establishments are located at major textile centers in Central Java: Pekalongan with 85 establishments employing 8,908 workers, Surakarta with 52 establishments employing 7,556 workers, and Semarang with 22 establishments employing 8,095 workers. In other words, 92 percent of establishments and 80 percent of employment in modern mechanized textile factories were concentrated in those three areas in Central Java. On the other hand, nearly 62 percent of all workers engaged in household and cottage units in textile industry in Central Java is found in 5 areas: KDY Pekalongan, KB Pekalongan, KB Pemalang, KB Sukoharjo and KB Sragen.

06.085 Because the textile industry in Central Java depends heavily on imported materials since neither cotton nor synthetic fiber are produced in any significant amount at all in Central Java, the industrial locations of textile factories have tended to be strongly determined by the availability of port facilities and railway and road transportation. In this sense, it would be natural that the textile factories spread in three major directions with a center at Semarang: Semarang-Pekalongan-Pemalang; Semarang-Yogyakarta; and Semarang-Surakarta-Sukoharjo. The pattern of geographical distribution also coincides with the area concentration of traditional textile industries.

06.086 At the present, the majority of large textile factories in Central Java is engaged in either spinning, weaving, or both. Out of a total of 239 units of installed machinery, 137 are for weaving, 50 for printing and finishing, 20 for dyeing, and 8 for spinning. According to information from Dinas Perindustrian Jawa Tengah, capacity is 229,180 spindles, 55 percent of which is owned by foreign investors' establishments, and 55 percent of all weaving machines is owned by foreign investors' establishments. Accordingly, it can be said that spinning and weaving industries in Central Java are considerably dominated by foreign-investors' establishments.

06.087 The value of total investment in the textile industry in the Province is explained by two categories: domestic and foreign. The domestic investment occupies nearly 30 percent of total domestic investment in Central Java: Rp.36,320 million of a total of Rp.113,746 million. The value of foreign investment in the textile industry in the Province reached to US$ 75.6 million, or nearly 60 percent of total foreign investment in the Province. The investment of 6 major foreign-owned establishments alone reached to US$ 69.6 million; these establishments employed 7,169 workers.

06.088 A possibility of further investment in the textile industry in Central Java have to be carefully examined both in terms of future demand and existing capacity of production.

06.089 According to an official estimate, the people of Central Java spend 6 to 8 percent of their income on the consumption of textile goods. The amount of per capita consumption of textile products is estimated at an order or 4 to 7 meters per year which is lower than the national average. It is also said that the demand for textile products will increase by from 1.9 to 5.2 percent per annum. We may say that the demand for textile products will certainly increase at higher rates than rates of population growth in view of the rising levels of incomes among the inhabitants in the Province.

06.090 The income elasticity of demand for certain types of textile products in the Province appears to be considerably high since the demonstration effects of modern clothing used by higher income groups have rapidly penetrated to lower income groups even in rural communities and particularly among younger generations both in urban and rural areas. At the present, the composition of textile consumption is assumed to be as follows: 20 to 25 percent for sarong and batik, traditional wearing apparel; 45 to 60 percent for a variety of ready-made wearing apparel, including western-type clothes and underwear, 5 to 15 percent for knitted materials; and balance being used for a variety of items.[14/] The changing consumers' preference for a variety of textile products will have profound effects on the structure of industry.

06.091 There is a likelihood of excess capacity in modern weaving factories. If we define rate of capacity utilization as a realized production against potential capacity of production, the average annual rate of capacity utilization in mechanized weaving factories was 84 percent during 1970 to 73 (see Table 6.15). Apparently since then, new capital investment on weaving industry has taken place. For example, P.T. Primatexco Ind. alone increased the weaving capacity of the Province by 36.6 million yards, employing over 1,100 workers.

06.092 The traditional sub-sector of the textile industry in Central Java appears to have met serious difficulties. The batik industry had 5,847 enterprises, employing 199,634 workers, in 1975. The overwhelming majority of them are small-scale enterprises. Hand weaving industry had 2,076 enterprises in operation, with 19,235 workers, in 1975. It should be mentioned that out of 2,978 licensed establishments in the hand weaving industry, nearly 30 percent are no longer engaged in production. At the same time, even those establishments which are still operating seem to have been doing so with extremely low utilization of capacity. For example, within a hand weaving and batik establishment employing less than 10 workers, 10 out of 14 weaving equipments and 12 out 17 block printing equipments for batik are not used at all. The average rate of capacity utilization in

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14/ Perkembangan Industri Tekstil di Jawa Tengah, 1975/76.

Table 6.15 Capacity Utilization of Textile Industry

	1969	1970	1971	1972	1973	1974
Machanized Weaving (Mil. Meters)						
No. of Establishments	104	120	129	139	142	140
Capacity	115	120	180	200	300	310
Actual Production	43	110	150	180	225	-
A./C. (%)	37	88	83	90	75	-
Hand Weaving (Mil. Meters)						
No. of Establishments	9,000	9,000	8,700	8,084	7,995	7,995
Capacity	86	84	80	75	70	70
Actual Production	41	40	38	37	25	-
A./C. (%)	48	48	48	52	38	-
Batik (Kodi = 20 Pieces)						
No. of Establishments	10,000	9,000	8,500	7,600	5,711	5,700
Capacity	1,600	1,300	1,400	1,600	1,600	1,600
Actual Production	350	450	500	500	768	-
A./C. (%)	22	35	36	33	48	-
Ready-Made Clothes (Pieces)						
No. of Establishments	680	700	736	786	786	786
Capacity	2,025	2,648	2,648	3,000	3,500	3,500
Actuarl Production	1,162	1,324	1,500	2,000	3,000	-
A./C. (%)	57	50	57	67	86	-

Source: Perkembangan dan Permasalahan Perindustrian Propinsi Jawa Tengah, 1974/75, p. 97.

batik industry in the Province was as low as 35 percent during 1969 to 1974. Also, the average rate of capacity utilization of the hand weaving industry was 47 percent during the same period. There are nearly 73,800 hand looms with a production capacity of 89 million meters of woven cloth in the Province. But many of them have already been made idle partly because of the competition with factory-made cloth at markets, and partly because of high prices of yarns.

06.093 Undoubtedly, indeed, hand weaving used to employ idle family labor to generate supplementary incomes to poverty-stricken rural families. However it has to be deemed as inevitable that the increase of factory production of fabricated textile products puts hand weavers out of work. A crucial question to be posed is whether or not other gainful opportunities for them can be provided.

06.094 Certain establishments in the batik industry appear to have found their way of survival, or even better prospects. All are large establishments which are able to meet the demand generated by the growth; some embarked on market research at their own expense in order to ascertain changes in local consumer preferences in pattern and design of batik; some specialized in fine artistic products; and others developed new markets for batik, such as the curtain material market. Many small-scale establishments in the batik industry, however, have been left far behind in maintaining their presence in markets, and forced to close down.

06.095 Nevertheless, it appears that there are certain branches of the textile industry which may have quite the bright prospects for the future expansion. In the ready-made cloth industry and wearing apparel industry, for example, we found considerable potential. The demand for school uniforms will definitely rise, and that for ready-made half-sleeve shirts and Tong-steeve shirts, men's trousers and women's pantaloons and skirts, and fashion clothes, will certainly continue to expand. At the present, however, quite a considerable proportion of those products, except school uniforms, are imported from other developing countries and even from developed countries.

06.096 The import substitution of wearing apparel should be accelerated. The trend of rates of capacity utilization has clearly been rising in the wearing apparel industry: a continuous improvement from as low as 50 percent in 1970 to 86 percent in 1973 (see Table 6.15). The number of establishments in the wearing apparel industry has also increased from 680 in 1969 to 786 in 1974. Dinas Perindustrian Jawa Tengah also made some effort to improve the technical skills prevailing in the present ready-made cloth establishment through its BIPIK program. Considering the magnitude of the population whose preferences for modern clothes have rapidly been gaining strength, high priority should be given to import substitution of the wearing apparel industry. This will enable a relatively small amount of capital to generate a relatively large number of employment opportunities in Central Java.

6.4.4 Leather and Related Products Industry

06.097 Leather and related products industry has a long tradition in Central Java, and the Provincial Government seems to further develop this industry along with the demands arising from tourism. It is planned that Yogyakarta and Central Java Provinces will cooperate to establish a leather craft training center at Tegal in 1978. BIPIK also has given a high priority to providing technical training for leather craftsmen.

06.098 According to our interviews with some officers of local governments, the leather craft industry in Central Java needs to solve two major problems to exploit the rising demand for leather products. First, the quality of hide and skin must be improved by introducing better techniques to local tanneries. At the present, tanned leather often smells bad when damp or wet; thus bags and sandals made of that quality leather often is rejected by tourists, particularly during the wet seasons. Second, the quantity of production of hide and skin tended to remain stagnant since 1972, causing some problems in supplying tanned leather to manufacturers of leather products. Smuggling of leather was also mentioned as a cause of short supply of leather in the Province particularly during recent years.

06.099 Nevertheless, the production record of leather sandals reveals a significant increase in the last several years (see Table 6.16). With the help of the proposed technical training center at Tegal, further development of the leather craft industry may be possible, through such means as diversifying the kinds of products offered into a variety of items.

6.4.5 Wood and Wood Product Industries

06.100 This industry consists of 60 large, 130 medium- and 957 small-scale establishments, employing nearly 7,500 workers or 3 percent of total employment in the Province in 1975. Also, it is believed that a large number of persons are engaged in wood carving and furniture making on a part-time basis. There are a total of 355 sawmills, but only 79 are equipped with machines. In other words, 78 percent of existing sawmills in the Province are not equipped with any sort of power driven machine. In addition, conventional carpenters who used to manufacture wooden furniture have been experiencing increasing difficulty, suffering from competition with furniture made from metal.

06.101 Even though the Province is rich in teak, the wood and wood product industry relies to a considerable extent on transferred materials from outer islands. They are usually sold at auctions where, apparently, large mechanized sawmills tend to take a lion's share. Accordingly, smaller sawmills are not able to obtain a sufficient volume of wood. In addition, increasing dependency on transferred logs makes it difficult for smaller sawmills to transport heavy logs

Table 6.16 Leather & Related Industry

1969 to 1974

	1969	1970	1971	1972	1973	1974
Hide & Skin (tons)	1,506	3,795	3,029	4,489	4,242	4,275
Leather Products (Pieces)	-	-	-	-	100	250
Leather Sandal (1,000 Pieces)	70	98	207	268	450	500

Source: Jawa Tengah Dalam Angka, 1973-1975, p. 212.

from ports to their mills. In many cases smaller sawmills are located at remote areas where road access is considerably poor. Because of this, differentiated auctions between large and small sawmills did not help small sawmills so much as the Government intended. Furthermore, log prices as well as prices of finished goods, say, wooden boxes and furnitures, are by and large determined by competitiveness of large-scale establishments. As a matter of policy alternatives for promoting the wood and related product industry, it may be inevitable to locate future sawmills near harbors. In this sense sawmills without machines located in remote areas, may be advised to change their lines of activities toward finishing processes of wood products, aiming to sell to small local markets.

06.102 Wood carving is concentrated in Jepara and its environs. Technical schools, at both junior and senior levels, have been training local boys in wood carving. The quality of their products seems to be quite adequate for the tourist trade. It is again a matter of marketing to major tourism centers. We see an important role of middlemen in marketing wood carving items. KB Jepara established a fine showroom in the town, but the number of visitors appears to be rather small. It may be advisable to shift the showroom to either Yogyakarta or Surakarta.

06.103 In some cases, wood carvings are an art, similar to fine batik products. It appears, however, that the value of products and craftsmen's skill in producing fine artistic items are not necessarily appreciated in the country. In order to encourage those craftsmen with skills it may be commendable to hold annual contests which will give winners certificates and due rewards.

06.104 According to Dinas Perindustrian Jawa Tengah, Surakarta is designated as a place where a joint provincial center of wood carvings will be established by Central Java and Yogyakarta. In view of types of products which tend to attract more tourists attention than other manufacturing products, the proposed center may also be given the function of marketing in addition to technical training.

06.105 Production statistics of wood industry seem to be extremely unsatisfactory (see Table 6.17). The following figures give nothing but confusion for users of industrial statistics.

Production of Lumber by Sawmill

Source	1970	1972	1974	1975
Data Perindustrian 1975/76 (1,000 m^3)	475	480	29	30
Annual Report Data Perindustrian (1,000 m^3)	43	89	115	115

Table 6.17 Wood & Wood Products Industry

1968 to 1975

	1968	1970	1972	1974	1975
Sawmill With Machine[1/] (1,000 m^3) (22+13+44=79)[3/]	122	475	480	29	30
Wooden Boxed[1/] (1,000 Pieces) (0+3+45=48)	-	203	-	156	291
Furnitures[1/] (1,000 Pieces) (37+92+556=685)	6,072	7,663	15	158	207
Total Lumber Production[2/] (1,000 m^3)		43	89	115	115
Number of Establishments		137	294	359	360
Number of Workers (1,000 Persons)		1.4	2.1	2.6	2.6

Notes: 1/ Data Perindustrian 1975/76, 1972, p. 44; 1974, p. 38; and 1975, p. 25.

2/ Dinas Perindustrian Annual Report 1975/76, Table 5.

3/ As in Table 6.13.

Source: Perindustrian 1975/76.

06.106 According to Data Perindustrian 1975/76, a sharp drop happened between 1972 and 1974 in the production of lumber by sawmills. No explanation is given for this change in the source of information. The two series of production figures are based on the same primary sources, and use the same unit, yet show completely different figures. It is deplorable indeed to see such inconsistencies.

6.4.6 Clay and Stone Products Manufacturing

06.107 A characteristic of this industry is that an extremely large number of very small establishments and household production units spread throughout the Province. According to Data Perindustrian Jawa Tengah 1975/76, there were 2,846 establishments, employing nearly 12,000 workers. At the same time, the inventory of small-scale and handicraft industries in the Province revealed that nearly 10,000 units in brick making, roof tile making, and lime kil hs, employed nearly 30,000 workers in 1975. According to various volumes of Data Perindustrian Jawa Tengah, the production of red bricks and roof tiles expanded enormously since 1968. In the case of bricks, production rose from 6 million bricks in 1968 to 192 million with a value of Rp.534,123 millions, while production of roof tiles rose from 28 millions in 1968 to 462 million pieces with a valua of Rp.742,686 million in 1975.

06.108 We are, however, puzzled by the production statistics. Taking for example 1975, according to Data Perindustrian Jawa Tengah 1975/76, there were 522 establishments in which 512 are small-scale establishments and 10 are medium-scale. These produced 192.1 millions red bricks with a value of Rp.534,123 millions. This implies that each unit on the average manufactured 31,000 bricks per month or nearly 1,000 a day, or a production of nearly Rp.1 million a year per unit. This may mean also that the average value of production per unit was Rp.83,333 per month, or nearly Rp.2,700 per day.

06.109 Almost all the red brick manufacturing units use no power-driven machine, but rely exclusively on cheap labor. Raw materials cost almost nothing since they are collected from river banks and paddy fields. Firing of brick is done in most cases by burning husks of paddy which also cost almost nothing. Now assume that a small-scale establishment employs 9 workers at Rp.150 per day; then, wage costs are Rp.1,350 per day against the value of production of Rp.2,700 per day. A handsome margin of net profits at Rp.1,350 per day will remain in the hands of the owner. Similarly, we can say that manufacturing of roof tiles appears to be as profitable as that of bricks. The mushrooming increase in red brick and roof tile manufacturing units in the Province thus can be partly explained by a profitability of this industry.

06.110 As long as we rely on the official statistics for red brick manufacture, production of 1,000 pieces of bricks a day by 9 workers seems to be quite possible. According to other data, namely Inventarisasi Industri Kecil dan Kerajinan (Inventory of Small-Scale

and Handicraft Industries), one worker is producing nearly 600 red bricks a day on an assumption of 365 working days. We found also that a roof tile maker can make 370 tiles a day.

06.111 We were told at various occasions that both red bricks and roof tiles are of very poor quality. Dinas Perindustrian Jawa Tengah and kabupaten governments are seriously concerned over the quality of the products of red brick and roof tile manufacturing. BIPIK is now more concerned than before over improvement of the quality of products in those industries. Standardization and quality control are the objective of industrial extension service program for these industries. *We strongly recommend continuation of this line of effort.*

06.112 To acheive this objective, it should be necessary to provide better tools and equipment. Three kinds of changes will be indispensable for further growth of the industries in view of manufacturing of better-quality products. First, in the baking of those clay products there must be a change from burning of rice husks to use of oil burners which can give higher temperatures in kilns. Second, iron casting molds, instead of wood molds, should be used in order to make products or standardized quality. Third, marketing of those products must be improved in order that the level of inventory can be adjusted to demands.

6.4.7 Chemical, Rubber and Plastic Industry

06.113 This industry has been growing rapidly in the Province. In 1975 there were 290 establishments of which nearly 40 percent were large- and medium-scale establishments, employing 8,200 workers. Production trends in various branches of the industry reveal rapid growth (see Table 6.18). Between 1969 and 1975, the production of soap and detergent increased from 5,840 tons to 21,433 tons, bicycle tire production increased from 321,000 to 1,352,000 tires, plastic products increased from 500 tons to 2,154 tons, and traditional Java medicine increased from 11 tons to 361 tons. The production of cosmetics more than tripled from 1968 to 1972, and this sharp increase must have continued since then.

06.114 If future industrial development of Cilacap includes the establishment of heavy and chemical industries, the present composition of production of the chemical industry will change tremendously. However, the current pattern of the structure of chemical industry which is marked by strong orientation toward consumer goods should also be encouraged. On the other hand, substitution of plastic products for traditional wares has been taking place, particularly in regard to pottery and sandals.

Table 6.18 Production of Chemical, Rubber & Plastic Industries, 1968 to 1975

	(Unit)	1968	1970	1972	1974	1975
Soap & Detergent (4+11+41=66)	(Tons)	5,840	13,203	12,962	9,223	21,433
Bicycle Tire (3+2+1=6)	(1,000 Tires)	321	144	950	739	1,352
Plastic Products (7+23+18=48)	(Tons)	500	360	478	1,839	2,154
Cosmetics (2+2+4=8)	(Liters)	500	11,130	17,200	-	-
Java Medicine	(Tons)	11	44	71	1	361

Source: Data Perindustrian 1975/76, 1972, p. 48; 1974, p. 40; and 1975, p.31.

06.115 A factory for manufacture of citric acid is about to start its production. Mosquito coil manufacturing will be helped considerably if pyrethrum flowers can be grown in larger quantities as BKPM-D expects. In addition, BKPM-D anticipates and expansion of cultivation of "melati" (plant with aromatic flowers) in order that extraction of perfume essence from the plants can be promoted. It is said that recently this flower has come to be in high demand in perfume industries in Europe and U.S.A. Not only for overseas markets, but also for the growing cosmetics industry in the Province, the expansion of the cultivation of the flower will be quite useful.

06.116 On the other hand, some branches of chemical industry in the Province suffered from competition with the products of foreign investors' establishments and imported goods. Taking for example domestic soap manufacturing, prices of palm oil, an indispensable raw material for soap production, are soaring not only in the international markets but also in domestic markets. While large companies in the detergent manufacturing field enjoy handsome tax holidays and other incentives, traditional domestic soap manufacturer are left unprotected from competition. Unless productive equipment of domestic soap manufacturing can be improved considerably, a number of them will be driven out of business.

6.4.8 Printing Industry

06.117 It is interesting to note that the printing industry in Central Java is mostly concentrated in Kudus, the center of the kretek cigarette manufacturing. Rp.1,534.8 million, or 74 percent of total investment in the printing industry since 1970 to 1975, took place in Kudus. Rp.367.4 million or 18 percent, were invested in the printing industry in Surakarta, the second largest kretek cigarette production center in Central Java in the same period.15/ In fact the growth of the printing industry in Central Java can not be fully understood unless we consider its relations to kretek cigarette industry. Production of 750.7 million packages of cigarettes means that there is a big demand for a printing industry which can supply printed paper boxes. In order to compete in the limited-size market, each kretek cigarette manufacturer demands fine and colorful printing for their packages so that more consumers can be attracted to own brands. Because of these conditions, a considerable number of printing companies possessing highly refined techniques in color offset printing have been set up in Kudus and Surakarta. This development, in turn, has generated new demand for their services, for making packages for a variety of goods like pins, buttons and so, on but also for extremely colorful calendars, the demand for which is quite high and increasing. Almost are printed in Kudus.

15/ Data Perindustrian, 1975/76, p.66 - 67.

06.118 The printing industry seems to have a very good prospect for the future since the number of children attending school will certainly increase not only by an increase in their absolute numbers but also by improved school enrollment by respective age-groups. The printing industry in Kudus, however, appears to be specialized in offset printing. In order to exploit the growing demand for printed materials, the Kudus printing industry ought to diversify its lines of production and techniques, and to increase type-setting capacity. If this can be acheived, the demand for compositors will create a considerable number of employment opportunities since type-setting is very labor-intensive.

6.4.9 Metal Processing and Repair Industries

06.119 There were nearly 1,700 establishments in metal processing and repair industries in Central Java in 1975. Nearly 90 percent of all are small-scale industries ranging from tin-smith workshops without any sophisticated equipment to ones with turneeis well organized but without power equipment. The extent of labor intensiveness in production in those small-scale industries is astonishing. A lathe is driven by hand and is being used to manufacture essential parts of automobiles. A score of medium-scale establishments in metal processing seem to have been fairly well equipped with a number of electrified lathes and other power driven machines, in addition to iron and/or copper foundries. The trade area of those medium and small-scale industries appears to be surprisingly wide, including not only Java Island but also outer islands like Sumatra. Marketing, both of raw materials and products, depends entirely upon middlemen operating in major cities in Java. It may be natural that the scale of operation in this medium- and small-scale industry does not make it possible to establish independent networks for distribution. In this sense, roles played by middlemen appear to be decisively important. From our limited number of interviews with owners of those establishments, it became clear that the Railway Workshop in Jakarta and repair factories for sugar factories in Tegal have historically been the most important sources for creating industrial skills of metal processing industries, and skills once acquired by craftsmen have been passed on to their sons who worked with their fathers at their own workshops. In this sense, an informal on-the-job training at family enterprises can not be viewed lightly in considering the metal processing industries in Central Java.

06.120 A few examples will illustrate the nature of technologies adopted by those medium- and small-scale establishments in metal processing industry.

06.121 In the first place, the most labor intensive operation is to be found in a number of repair and processing workshops. A couple of men work with a hand driven lathe: a man as a turner and another being power generator. A power generating mechanism of a bicycle, namely a large gear with a handle (instead of a pedal), is connected to

a smaller gear by a chain, and a man turns the handle to generate power for a lathe. At a workshop in Tegal, 8 hand-driven lathes and 3 hand-driven drills are used by 22 men under the supervision of an owner and his son, producing 750 sets of small automobile parts each month. In addition, this shop manufatures 800 sets of particular types of bolts and nuts every 3 months. Orders are obtained through middlemen from Semarang, Surabaya and even from Sumatra.

06.122 Secondly, another workshop employs both hand-driven lathes and a motor-driven lathe: a small motor replaced manual power. It is apparent, indeed, that labor productivity of the motor-driven lathe is significantly higher than that of a hand-driven lathe. The establishment, however, is unable to increase a number of motor-driven lathes since the supply of electricity by P.L.N. is limited and often interrupted. The establishment employs more than 35 workers with one motor-driven lathe, one motor-driven drill, and 7 hand-driven lathes. This enterprise is categorized as "medium"-scale since it has power equipment. The lines of products are also identical to the establishment mentioned above: parts and bolt and nuts.

06.123 Thirdly, there are a number of well-organized metal processing and repair factories which are equipped with electrified lathes and other equipment in addition to an iron foundry and/or copper foundry. One factory we observed has an iron foundry having the capacity of 3 tons per day, a dozen electrified lathes, mostly made in the People's Republic of China, and a variety of power-driven machines. An electric generator (30 kW capacity) has been installed to provide electricity. Among the line of products of the establishment, there seems to be a certain extent of specialization in manufacturing of roof tile cast iron. It claims annual production of 90,000 roof tile cast iron, and through middlemen's networks it supplies roof tile cast iron to all of Java Island. All the workers employed have been trained on the job.

06.124 Another iron foundry in Tegal produces a large number of iron-made manhole covers for sewerage construction in Jakarta, in addition to a variety of construction materials. It is equipped with two iron smelters, one for stand-by, of a capacity of 3 tons per day, and one small smelter for copper. All the machines get electricity supply from a generator installed in the factory.

06.125 Finally, a blacksmith workshop. No power equipment at all, but with an innovation. It uses a oxyhydrogen blowpipe for manufacturing of construction bolt and nuts, falk hoes, and a variety of hinges. Here also is a sort of specialization in manufacturing of plasterer's tools which are sold to middlemen who, according to the owner, sell them throughout the country.

06.126 It appears from our limited observation and through discussion with a number of officials in the field, that the future prospect of metal processing and repair industries is considerably bright. A large plant assembly diesel engines, namely P.T. Kubota Indonesia, has been operating at full capacity, and making net profits from the first year of its operation. The medium- and small-scale establishments also have been working almost at their full capacity, although the technology employed at each establishment varies considerably as mentioned above. The fact that middlemen visit their client-establishments sometimes twice a month and mostly once a month is evidence of busy activity in the metal processing and repair industries.

06.127 However, there are some crucial problems to be solved. At least, three problems seem to be at hand. First, most of the medium- and small-scale establishments are weak in management. Although owners and their sons are often very skilled workers in their occupations, their experience as an owner of a factory or workshop is usually insufficient particularly in regard to management. For example, they appear to be at the mercy of the latter during price negotiations with middlemen. If they know what prices are offered at different factories or workshops, they may be able to negotiate with middlemen. In this regard, it appears to be essential to compensate for lack of experience by organize themselves into trade associations, which at least can function as machinery for furnishing information services regarding prices, market conditions, and possible sources of better technology.

06.128 Secondly, the supply of industrial electricity is vitally needed for improving the conditions of workshops now without power equipment. They are too small to install their own generator. In the short-run, workshops without power equipment may survive and may even prosper. But their scale of operation is too small to compete with factories with mechanized equipment. If the number of medium-scale factories increases in the future, the smaller workshops may be driven out of business. On the other hand, they appear to have sufficient capital accumulated by hard work to buy one small electric motor or two which can be installed to power present hand-driven equipment, provided that they are guaranteed a supply of electricity. The improvement of existing workshops without power equipment may entirely depend on the issue of public electric supply. Even for potential investors in medium-scale factories, the supply of electricity will be the important factor in a sense that a limited amount of initial capital can be used for purchase of machines.

06.129 Thirdly, the sense of precision of work must be cultivated among the workers. The training of workers has mostly been carried out on an on-the-job basis. The level of prevailing skills of those workers may be sufficient as long as metal processing and repair industries are engaged in the manufacturing of parts and construction materials. In the future, however, the metal processing industries have to expand their lines of activities to manufacturing of certain machines. It is not possible to create a body of skilled workers with a sense of precision in a short period. The existing

metal processing establishments have to be regarded as the embryoes of machine industries for the future. It is of this reason that the industrial workers in the existing metal processing factories must be given more systematic training at least to such an extent that they can handle high-speed universal metal processing machines.

06.130 There are two centers of iron foundries in Central Java: Tegal and Klaten. In Batur village, Kecamatan Ceper in Kabupaten Klaten, nearly 100 families are engaged in iron casting. According to an industrial officer's estimate, the village has a total capacity of 12,000 tons per month in iron casting, manufacturing a variety of products like the treadle of sewing machine. Until recently, the village did not have any finishing facilities of casted iron. However, BIPIK provided a complete machine shop to the village so that finishing processing can be completed within the village before delivery. In contrast to this, most of the iron foundries in Tegal have been equipped with some means of finishing for many years. Particularly, PT Barata and PT Dwika in Tegal are large-scale metal processing factories which have been producing a variety of iron products. Also, there are 55 workshops of medium-scale in Tegal. Therefore, Tegal as an center of iron foundry seems to have better production facilities than that in Klaten.

06.131 Traditional blacksmiths are also found in a large number in several areas. For example, there are 186 in Klaten, 110 in Tegal, 76 in Magelang, 44 in Purworejo, 68 in Sragen, 36 in Kebumen, and 60 in Purwokerto. It is said that most of those blacksmiths are mainly producing farm tools and equipment, crude kitchenware and the like. Tegal and Pati are two major centers of brass works producing kitchenware and some ornaments. Considering the different development stages of metal processing units in Tegal, as we described, some of those village blacksmiths may have potential to develop into more modern metal processing units. In Purbalingga nearly 30 tinsmiths have developed their line of production to manufacturing of components of automobiles, specializing in a particular muffler. As mentioned, the value added of those metal processing industries is much larger than textile industries even in the category of household and cottage industry. In this regard, it is important to make metal processing industries more productive. Although it may not be achieved in a short period, we can envisage a formation of stepping-stone type metal processing areas with a center at Cilacap. Namely, from Cilacap to the north and east: Cilacap-Purbalingga-Tegal and Cilacap-Magelang and/or Cilacap-Klaten.

06.132 In fact, the production trend in the metal processing industry seems to show an accelerated development in various branches (see Table 6.19). Taking for example blacksmiths, it is estimated that the total amount of metal processed by blacksmiths increased from 2,150 tons in 1968 to 4,000 tons in 1970 and 15,600 tons in 1972. Nearly 2.2 million pieces with a value of Rp.650 million, mostly farm tools and equipment, were manufactured by blacksmiths in 1975. These

Table 6.19 Production of Metal Processing Industry

		1968	1970	1972	1974	1975
Blacksmith (0+0+663=663)	(Tons/1,000 Units)	2,150	4,000	15,600	1,621	2,206
Iron Smelting (5+67+14=86)	(Tons)	98	903	4,600	8,900	13,058
Nails (1+1+0=2)	(Tons)	-	-	-	1,800	2,760
Bicycle Assembly (0+0+1=1)	(Units)	1,260	1,548	3,600	-	6,000
Auto-Repair (3+36+72=111)	(Vehicles Repaired)	9,955	9,372	15,372	12,276	39,866

Source: Data Perindustrian 1975/76; 1972, p.60; 1974, p. 43-44; and 1975, p. 41-42.

figures imply that a single blacksmithshop produced on the average 204 units of products per month or about 6 units per day. In view of the crude tools and equipment which ordinary blacksmiths in rural areas employ, this level of production may be of on the right order. The quantity of iron smelted also sharply increased from only 98 tons in 1968 to 13,000 tons in 1975. Production of nails was 1,800 in 1974 but jumped to 2,760 tons in 1975. The number of bicycles assembled in the Province rose from 1,260 units in 1968 to 6,000 units in 1975. Apparently the demand for bicycles will continue to increase in the future. The number of automobiles repaired has also shown an accelerated increase from nearly 10,000 units in 1968 to about 40,000 units in 1975. Improvements in technical skills and the managerial ability of entrepreneurs in the metal processing industry therefore will play a crucial role in exploiting the trends of rising demand for metal products, and in order to spread the impacts of Cilacap's industrial development to many parts of the Province, industrial extension services must be strengthened in metal processing industries.

6.5 Review of Development Measures in Manufacturing

06.133 Both the Central and Provincial Governments have been undertaking a number of development measures for promoting the industrial sector in Central Java. A number of promotional policies have to be discussed at the national level, while some can be discussed at the Provincial level, and even local government level, e.g., kotamadya and kabupaten. In studying the industrial development of Central Java, we discuss more in detail those development measures which may have direct and immediate impact by initiatives of the Provincial Government as well as local governments.

06.134 Generally speaking, both national and provincial projects which are currently undertaken in the Province reflect the prevailing conditions of the industrial sector in the Province. They reveal clear orientation toward strengthening small-scale and household industries. We envisage that this orientation should be maintained and further be intensified in Repelita III. Large-scale establishments can manage themselves without much governmental assistance but small-scale and household industries have to be assisted by the Government. In the industrial development in Central Java, whether or not small-scale industries can be up-graded to medium-scale and whether or not household industries can be made more economically productive will determine future development.

6.5.1 National Projects

(a) BIPIK: Industrial Extension Services for Small-Scale Industries

06.135 Since the inception of Repelita II, new industrial extension services called, BIPIK in short have been implemented in Indonesia as a whole. Central Java also has made notable progress in executing this program. In 1974/75 Rp.25 million was allocated to the Provincial Government and the funds available for the implementation of BIPIK were rapidly increased, to Rp.44 million in 1975/76, and further to Rp.82 million in 1976 to 77. This represents an expenditure of Rp.2,500 per establishment for the small-scale segment of the manufacturing sector. At the time of the inception of BIPIK each local government, e.g., of kabupaten and kotamadya, were given Rp.100,000 for implementation of BIPIK. The allocation of funds for local governments however ceased in the second year of execution, and this part of the funds were then allocated, to the Provincial Government. In order to strengthen its activity, Extension Service Center for Small-Scale Industry was established in Yogyakarta in 1976/77 jointly by the two provincial governments of Central Java and Yogyakarta.

06.136 The functions of BIPIK are (1) guidance and counselling, (2) technical training, (3) technical and managerial advisory services, and (4) information and promotion services. The first two functions are carried out under the leadership of Dinas Perindustrian Java Tengah while the third and fourth functions are centrally provided at the Extension Service Center at Yogyakarta .

06.137 According to "Annual Report of Dinas Perindustrian 1974/75", a total of nearly 2,900 establishments and 9,200 persons were assisted by BIPIK, implying an average expenditure of Rp.8,600 per establishment serviced. Reflecting the industrial structure of small-scale industry by branches of manufacturing in the Province BIPIK is primarily concerned with a limited number of industries. Brick and roof tile, tahu noodle and krupuk, batik, bamboo products, leather products and limestone kiln industries were most frequent objects of the industrial extension services under BIPIK. There were also a number of blacksmiths and construction material manufacturers who received BIPIK assistance.

06.138 The staff for implementation of BIPIK are of somewhat doubtful capability. It is said that in view of the transitional stage for establishing BIPIK all officers in technical departments of Dinas Perindustrian are concurrently serving as staff members of BIPIK, and all technical officers of the Department of Industry at kabupaten and kotamadya governments also belong to BIPIK. In other words, BIPIK does not have its own full-time staff assigned to industrial extension services. This may not be true for staff members of the Industrial Extension Service Center at Yogyakarta, but as far as Central Java is concerned, there is no full-time staff for BIPIK at the present.

06.139 According to Study team hearings, the technical part of Dinas Perindustrian Jawa Tengah has four sub-sections: (1) basic and chemical industry section with 5 staff members; (2) textile section with 10 staff members; (3) light industry section with 15 staff members; and (4) handicraft section with 10 staff members. They are organizers and implementators of BIPIK, but their tasks are more in the nature of giving guidance and counselling. For more technical training, instructors are invited from relevant technical institutes in Jakarta, Bandung and Yogyakarta.

06.140 One of the serious problems which BIPIK has been facing, seems to be the relative lack of competence of officers at kabupaten and kotamadya levels. The Study team was much impressed by dedicated performance of some officers at a number of kabupaten and kotamadya, but at the same time we had an impression that re-training on the basis of an in-service training scheme is much needed for local government officers. We also believe that it is too much to expect local officers to provide technical training in view of the wide variety of training activities needed in small-scale industries. An officer may be well qualified in providing technical training on brick and roof tile manufacturing, but he may not be competent in textile or bamboo products.

06.141 This problem seems to have compounded effects in efficient implementation of BIPIK. At the present, the industrial extension services under BIPIK are of the nature of "once-for-all" in each area where the services were provided. A week of meetings is held at one area for one branch of manufacturing, and that is all. Further implementation of industrial extension services left entirely to officers at local governments, who often are not competent or qualified to carry out follow-up services.

06.142 To insure fairness, it is acknowledged that it may be justified to spread BIPIK activity as wide as possible in the Province. On the other hand from the point of view of efficiency, it would be more advisable to provide BIPIK to carefully selected industries and areas and then to provide intensive follow-ups. In doing so, we can expect a quick result in improving productivities of small-scale industries, and those which will have achieved rapid progress may be used as models and examples for further implementation of BIPIK in other industries and areas. In many cases entrepreneurs learn by themselves more thoroughly from other successful entrepreneurs' experiences than from thinly-spread industrial extension services.

06.143 The role of "Cadis" (a special industrial office at the kabupaten level) seems to be quite important from the point of view of introducing the putting-out system to small-scale industries. However, it is not clear "Cadis" is functioning. While the Study team was visiting all kabupatens and kotamadyas in the Province none of industrial officers met mentioned the existence of this sort of office in their areas. However, according to information available from Dinas Perindustrial it is "Cadis's" function to provide guidance and counselling to small-scale industries.

(b) IPID: Investigation of Provincial Industrial Development

06.144 During 1973/74 Dinas Perindustrian Jawa Tengah launched a project called "Investigation of Provincial Industrial Development" (IPID). The objective of IPID is to collect industrial statistics in order to make a regional development plan for the industrial sector. 6,297 questionaires were sent to industrial establishments in the Province through the industrial department of kabupaten and kotamadya governments in 1973/74. As of March 1975, 4,477 filled-in questionaires, or 71 percent of the total were recovered. The rate of recovery was in general low in kotamadya: only 33 percent in Semarang, 64 percent in Pekalongan, 66 percent in Surakarta. On the other hand, there were 8 kabupaten and kotamadyas where rates of recovery exceeded 100 percent. The reason was, according to Dinas Perindustrian Jawa Tengah, that a number of questionaires distributed to those kabupaten and kotamadyas was too small and each of those local governments reproduced questionaires at their office for circulation. This explanation suggests that IPID might not have been conducted on the basis of a systematic sampling technique. In addition, the Provincial office of industry criticizes kabupaten and kotamadya industrial offices because reports from those offices contain too many estimates and that numbers given can not be real. It is stressed that the data collected will be used for formulating a regional development plan for the industrial sector. But it may be difficult to make any realistic plan using the information obtained by those methods. In this regard, the Provincial office intends to conduct renewed implementation of IPID on a continuous base. This program should be encouraged. But, at the same time, it should be stressed that analysis of data collected can not be feasible if the quality of compilation of industrial statistics is so deplorably low.

6.5.2 Provincial Projects

(a) Investment Coordinating Board of the Province (BKPM-D)

06.145 BKPM-D is functioning to coordinate investment projects which will require Rp.50 million or less of capital in the case of domestic investment, and US$300,000 or less in the case of foreign investment. It seems that BKPM-Pusat (Central Investment Coordination Board) is handling the projects over Rp.50 million and over US$300,000 respectively. For example, such a large investment like that needed for the cement factory at Cilacap should require initial contacts with the Central Investment Coordinating Board (BKPM-Pusat). In fact, a number of large establishments had made applications to BKPM-Pusat at first, and then were suggested to select industrial locations in Central Java. BKPM-D then advised these investors to select their sites from various alternative locations in the Semarang Industrial Estate Tugu.

06.146 Considering the case of the pelletizing industry and tapioca flour industry which opened a couple of new large-scale factories in recent years, there is a good reason for doubting the effectiveness of BKPM-D's coordinating function in industrial investment. Two industries are competing for the same raw materials and, apparently, excess capacities were built in terms of available quantity of raw materials in the Province. As we mentioned, the present difficulty in obtaining a sufficient amount of cassava may be in the nature of a short-term problem, but it may still take some time to adjust the supply to match new demand conditions.

06.147 Since the recommendation from BKPM-D is important in obtaining bank loans and credit, it seems to be important for promotion of medium- and small-scale industries that BKPM-D assume more active roles in coordinating both new and expansion projects involving even relatively small amounts of capital.

(b) Public Enterprises Owned by the Provincial Government

06.148 There are 38 enterprises which are owned by the Provincial Government. Most of them were taken over from Dutch at independence, and subsequently were nationalized. Therefore, some factories are still using machines almost 50 years old. We visited three factories, an ice making factory, a coconut oil factory and a textile spinning mill, all in Semarang. Although our observations are very limited, we still had an impression of economic inefficiency in operaiton and management. Both coconut oil factory and ice making factory appear to be at an untolerable level of under-utilization of capacity. The coconut factory employs 150 workers who are almost out of work because of the shortage in supply of raw materials. The current rate of capacity utilization is as low as 20 to 25 percent. The workers are being kept at the factory without there being any work for them. The ice making factory has three old machines of which only one is presently operating. The spinning mill is running fairly well. However, the mill has been suffering from a short age in supply of cotton in recent years. As a public enterprise it gets raw cotton through another public agency which receives cotton from the USA on the basis of PL480 aid. In other words, the management of the spinning mill can not try to secure the supply of cotton from any other source.

06.149 We had the strong impression that all managers in the public enterprises owned by the Provincial Government ca not fulfill managerial functions but are only caretakers for routine matters. For example, the manager of the coconut oil factory is able to employ the workers more productively when they are idle owing to the shortage of raw materials. Consider that the factory is operating at only 20 percent of its capacity. This may well mean that for more than six months a year, the workers have to report daily to the factory only to find no work to do. As a public agency which is partly responsible for maintaining current job opportunities for workers, the factory can not reduce its work force even when making big losses. Thus all workers

get wages and salaries even when they have no work at all. The manager may try to employ those workers for other productive activities. The workshop with a number of electified machines may be used for the production of parts and components, and other workers may be employed for manufacture of bamboo craft, for example. He has, however, no authority to change routines so that he has to ask for higher authorities permission. It is also not possible for managers of public enterprises to make any plan for capital investment or replacement of machines. At the higher levels, such as the board of directors of the Provincial public enterprise coorporation, are also bound by much red tape.

06.150 A public coorporation can play significant roles in transfer of technology and can provide a large number of workers with on-the-job training. These functions are crucial in developing countries where new technologies must be introduced for industrial development. Public enterprises in the Province do not engage in these important functions partly because their machines and equipment are almost all outdated, except in the spinning mill, and partly because the regulations concerning to them do not permit such functions.

06.151 We are seriously concerned over the present state of public corporations owned by the Provincial Government. Frankly speaking, they do not cultivate any spirit of entrepreneurship, but rather kill any embryo of this vital element among managers. They do not make any contribution to transfer of technology and training of workers whose skill is a decisive factor for industry. Instead, they instill easy-going attitudes among workers since they are paid often without being required to do any productive work. It appears that most of public enterprises are operating at a loss, imposing a financial burden on the Provincial Government. We thus recommend the Provincial Government to take urgent action either to make them more economically efficient or to sell them to private investors.

(c) BAPPIKRA: Guidance and Development Committee of People's Handicraft Industry

06.152 In addition to BIPIK, the Central Java Government has established and is implementing its own industrial extension service program, called BAPPIKRA, which particularly deals with the handicraft industry in the Province. In principle BAPPIKRA stresses the importance of an integrated system of industrial extension services which include (1) technical training, (2) financial assistance, (3) marketing, (4) quality control, and (5) management. Because of the complexity of contemplated services, not only Dinas Perindustrian but also such as PKK, BPD, BKK are also involved in the execution of BAPPIKRA. The primary functions of BAPPIKRA are counselling, credit support, and management support.

06.153 The implementation of BAPPIKRA, however, seems to us to be much different from that of BIPIK. For example, it completed 25 projects of guidance, training and counselling, with the number of participants at 794, during fiscal 1974/75. Judging from the number of projects and time spent, which is nearly 12 days per project, the content of activity of BAPPIKRA appears to be very much limited to, for example, explaining application procedures of credit and market outlets for handicraft products, and encouragement for organizing of cooperatives.

06.154 On the other hand, BAPPIKRA was successful in making arrangements with credit institutions for a total of Rp.5 million for two industrial cooperatives; one is in Tegal and another in Klaten. We do recommend more active roles for BAPPIKRA for alleviating difficulties of the handicraft industry in obtaining institutional credit.

6.5.3 Local Government's (Kabupaten and Kotamadya) Project

06.155 During our visits to each kabupaten and kotamadya government we obtained the budget books from 29 out of 35 local governments. Mr. Swardi of Dinas Perindustrian Jawa Tengah kindly prepared for us a list of development projects and budgets by those local governments for fiscal 1975/76 and 1976/77. Analysis of the list discloses some interesting points concerning local government policies for industrialization. First, the most frequently planned projects are guidance and training programs for red brick and roof tile manufacture, tahu, noodle and krupuk manufacture, and bamboo handicrafts. The amount of budget allocated to those projects vary considerably from one local government to another, ranging from Rp.200,000 to over Rp.1 million. Second, the largest development budget for fiscal year 1976/77 was Rp.4 million which was allocated to the construction of a showroom of a kabupaten's products in Tegal. Third, it is only KB Sukohardjo which allocated loans and credits for development of small-scale and handicraft in its area. Fourth, almost all kabupatens and kotamadya increased the amount of the development budget for industry from fiscal 1975/76 to 1976/77. Although the amount of development budget for industry in each local government seems to be rather small comparison to other sectoral development budgets, we are still convinced that local governments have been endeavoring to promote industries in their respective areas.

06.156 We are at the same time seriously concerned over the fact that too many similar lines of training and guidance are being planned by many local governments. Take, for example, bamboo handicrafts. How can each local government assure itself of a market for bamboo products if so many people in so many kabupaten and kotamadya begin to increase the output of the same kinds of bamboo products? In this regard, we may suggest that some kinds of local specialization must be necessary in future planning of development projects at local government levels. On the other hand, many handicraft projects are mostly of local

importance. An improvement in quality of red brick and roof tile, and tahu and tempe will be quite important for local consumers. Taking those points into account, it would be desirable that Dinas Perindustrian take the initiative in coordinating training programs of local governments so that local specialization of particular products can be further promoted.

Attention should be given to the point that the budget books of KB Cilacap for fiscal 1975/76 and 1976/77 did not contain any development budget for industry. Despite the fact that both national and Provincial Governments emphasize so much the importance of industrial development at Cilacap, this kabupaten government does not appear to be responding.

6.6 Alternative Development Strategies in Manufacturing

6.6.1 Conditions for Alternatives Development

06.157 We contemplate four alternative development strategies for the industrial sector in the Province. Since any instance of economic growth and development involves a complexity of inter-sectoral complementarity, the following strategies will naturally contain a number of "ifs", some of which may not be controllable at the level of provincial administration. It appears to us, however, that our analysis of the industrial sector in the Province encourages us to contemplate four alternative development strategies, of which none are in fact mutually exclusive but, rather, they are complementary to each other depending on the perspective of the envisaged time span. In this regard, we confine ourselves to a short-term perspective aimed at Repelita III. Also, we will narrow down our consideration to those which can be controlled at the level of the Provincial administration although some of them will naturally involve decision-making by the Central Government.

06.158 A number of factors in particular have to be taken into account when we envisage alternative development strategies for the industrial sector in Central Java. These factors are as follows:

(1) East and West Java, including city of Jakarta, have already built up to heavy and capital-intensive industries a considerable degree, and they will continue to further expand large-scale industries in the future. Central Java thus will be increasingly more rapidly integrated in the economies of those two early-starters.

(2) Not only with them but also with the Province of Yogyakarta, economic integration will rapidly take place in the near future.

(3) The industrial structure by scale of establishments of Central Java will remain unchanged unless some unforeseeable event occurs. Even if the Cilacap Industrial Development Program makes much progress during Repelita III, and even if the expansion project for Semarang port can be implemented, the relative importance of small-scale and household industries in the Province will remain unchanged.

(4) There are a number of areas where the industrial sector has relatively, and even absolutely, been developed. These areas will increase its ability to attract more investment than other areas which are less industrially developed. We may call these developed areas as growth center of the Province. The locations of the growth centers are unevenly distributed in the Province, with some concentration in the north coast plain and also on the route between Semarang and Yogyakarta. The south coast plains and central highlands do not yet have any significant growth centers. This geographical pattern of industrial location in the Province will also remain as it is, unless massive improvements in infrastructure take place in these unfavored areas.

(5) Dependency on imported and/or transferred raw materials in some industries in Central Java has notably increased during Repelita I and II, and this trend will persist for the future at least during Repelita III. In addition, diversification of the industrial structure in the Province may intensify to some extent the dependency structure of the industrial sector in the Province.

(6) Excess capacity has already been built in some industries while other industries suffer from a shortage of capital for investment.

(7) The number of potential investors with capital and managerial skill is short in Indonesia as a whole, and this problem is particularly acute in Central Java as compared to East and West Java. It can not be expected that this problem will be solved in such a short time as Repelita III.

(8) Wages rates in the Province are relative lower than any other province in Java Island, except possibly Yogyakarta. In view of the abundant labor supply in the Province, this situation will continue for the period of Repelita III.

(9) There are far too many cottage industries in which value added per worker may be even lower than wages paid, and these cottage industries marked by low productivity are concentrated in a few areas of activity. Efforts to gain

supplementary earnings by off-farm work will persist and will become intensified among rural families during Repelita III, since demonstration effects of urban life and sheer desire for better education and health will increase the amount of cash needed by rural families.

(10) Unemployment problems are serious, and will become worse during Repelita III in the Province of Central Java. Particularly, unemployment problems of educated labor force will become much more grave in the future.

On the basis of the above considerations and also our analysis on the industrial sector in Central Java, we present four development alternatives for further discussion.

6.6.2 Alternative I: Differential Growth Approach

06.159 In short, this alternative strategy stresses less investment on less-industrially developed areas and more investment on more-industrially developed areas. Industrial development requires some basic investment on infrastructure such as industrial electricity supply, industrial water supply, roads and railways and harbor facilities. If we spread thinly development funds available for infrastructure building over wider areas, few places will be able to get necessary infrastructure to any significant extent, both in terms of quality and quantity. It is thus conceivable to concentrate intensively capital outlay for infrastructure construction on currently existing growth centers so that investment environments in those growth centers will be greatly improved. Investors, particularly of medium- and small-scale industries, can not afford to expend capital on infrastructure. Therefore, an improvement in the infrastructure in the growth centers must be a pre-requisite for attracting more investment by relatively weak entrepreneurs.

06.160 Alternative strategy I thus contemplates a differential growth approach in the Province. During Repelita III, major growth centers, namely Tegal, Pekalongan, Semarang, Kudus, Magelang, Surakarta and Klaten, should be given highest priority in allocation of development funds for infrastructure. Industrial electricity supply should be made available to small-scale industries in those centers. Roads both inside the boundary of the municipalities and outgoing to other areas should be greatly improved. Particularly, roads and bridges on the national highway between Tegal, Pekalongan and Semarang; provincial highway between Semarang and Kudus; national highway between Semarang, Surakarta, Klaten and Yogyakarta; and national highway between Semarang, Magelang and Yogyakarta must be greatly improved. Loans and credits available for industrial investment and even for working capital requirements should be primarily given to those who are willing to expand their operations and who will open new establishments in these growth centers. BIPIK operations should concentrate on the entrepreneurs in the growth centers, with regular follow-up services. All effort

possible are to be made to strengthen the existing small-scale industries so that they can become medium-scale industries. Medium-scale industries are to be made more economically competitive with large-scale industries so that they can survive and even prosper in the course of further economic integration of Central Java with the economies of East and West Java.

06.161 Significant economic benefits should be derived for the Province if Tegal and Klaten can be made into centers of metal processing industries: Tegal can sell to markets both in Central Java and the eastern part of West Java Province, while Klaten may expand its trade area to more economically integrated Yogyakarta Province and even towards the western part of East Java. Pekalongan and Surakarta should further develop their textile industry by diversifying product mixes from spinning and weaving to ready-made wearing apparel. Batik industry in these growth centers should adjust their products to rapidly growing demand for materials for fashion clothes and shirts, and even for curtains and bed covers. Magelang's industrial development will give incentives to highland industrial crop production, which in turn will support the food processing industry in Magelang. Kudus also should diversify its production from concentration on kretek cigarette to the printing industry, and particularly type-setting, so that it can exploit the rapidly growing demand for printed materials. Kudus, with its infrastructure, can also attract a number of food processing industries utilizing raw material supplied from near-by kabupatens: groundnut from Jepara and soybean from Demak and Grobogan, and kapok from Kabupaten Pati. Semarang will still continue to be the largest growth center in the Province and if proposed improvement of the harbor facilities can be successfully implemented, it will definitely attract more investment, and particularly large-scale investment.

06.162 Spill-over effects of the further development of growth centers advocated above will be significant in terms of both growth of incomes as well as an increase in employment. In any case a larger number of landless or nearly landless rural families and particularly their sons and daughters have to drift from villages to growth centers in search for employment. Just absorbing even a part of them to proposed industrial development will have significance, but at the same time the remittance they will send to rural families will alleviate poverty-stricken rural families. In addition, the growth of urban economy in the growth centers will generate considerable demand for agricultural products for rural areas and remarkable increases in demand for labor in various branches of the tertiary sector.

6.6.3 Alternative II: Equity Approach for Allocation of Investment Projects

06.163 Although this approach does not exclude application of alternative I, we will consider the importance of diversifying industrial investment projects particularly to those areas where agricultural production alone can not provide even a low standard of

living to rural inhabitants. One may expect that the growth centers which have already built up a considerable degree of self-developing capacity can attract a sufficient number of private investors. Therefore the development funds of the government should better be used to alleviate the difficulty in less privileged areas in the Province. Even if we take this equity approach, it is not possible to support the development of all of less developed areas at once. Thus it is suggested to divide less developed areas into three categories -- least, moderately and most developed areas -- among the less developed areas, during Repelita III, BIPIK and BAPPIKRA operations should be concentrated to the least developed areas. This will help that generate opportunities to gain off-farm income in these areas. Choice of industry is crucial for this approach. We envisage a combined effort with the Ministry of Agriculture in order to introduce high value industrial crops suitable to each area. It is also important to make every effort to increase productivity of staple food crops so that more land can be released to industrial crops. Another potential industry will be ceramics, since nearly throughout the Province there are many red brick and roof tile manufacturers. If ten or a dozen of kecamatans in poverty-striken kabupatens are selected and if those kecamatan are given intensive training in ceramic so that they can be changed to units manufacturing improved chinaware, demand for which is quite high, the income and employment effect of this type of project will be significant. Also, we envisage a project of preferential purchase of handicrafts from more poverty stricken areas than from developed areas.

06.164 This approach can be combined with highland development. At this moment, fairly large parts of the highlands depend on conventional crops like maize and upland rice. Like a mushroom canning factory in Wonosobo, there must be a number of new kinds of crops suitable for diversification of crop patterns. For example, vegetable production aiming at markets in major growth centers will be quite possible in view of improved road transportation in recent years. In transporting vegetables, bamboo containers are widely used in the Province. Therefore, the development of vegetable production in relatively cool highlands will result in a large increase in certain types of bamboo products for the purpose of packing vegetables.

06.165 We believe that alternative II is valid even as a development strategy by itself it would be better if this approach is well integrated with development strategy I.

6.6.4 Alternative III: Mobilization of Potentials in Household and Cottage Industries

06.166 Considering the vast number of people participating in the household and cottage industries in Central Java, it should create an enormous impact on the economy of Central Java if these industries can be efficiently mobilized for industrial development of the Province. With this objective in mind, we may envisage the following strategy.

06.167 First, introduce more high value added kinds of activities to the household and cottage industries through BIPIK and BAPPIKRA with the help of existing entrepreneurs having organizational skills and capital. During Repelita III, the Provincial Government may try to introduce effective putting-out system as pilot projects in different branches of manufacturing industry. Second, give more preferential consideration to loans and credit to those potential entrepreneurs who are interested in promoting organized handicraft.

06.168 If, for example, over 500,000 units of household and cottage industries in Central Java can achieve production of value added per unit at the level of East or West Java, a considerable amount of income will be generated by these industries. Increased purchasing power resulting from this will provide strong incentives for other industries. In addition, it will help to improve the levels of incomes in "minus" areas if proper planning is done to introduce high value added activities to these areas.

06.169 This approach, however, requires much organizational capability of the implementing agency. For example, consider the assembly of the simple conponents of a radio. An agent must regularly provide materials for workers' units to assemble, and regularly collect from them, in addition to continuously training workers in those units so that products of guaranteed quality can be delivered. Only profit incentives can lead entrepreneurs to engage in such activities. We do not think that a public agency can operate this system as efficiently as profit-motivated private entrepreneurs.

06.170 This is why a concerted effort between the government and private entrepreneurs who have organizational skill and capital is so much needed in this approach. Whether or not this approach can be successful depends much on what kinds of incentives the Provincial Government, and possibly the Central Government, can provide such potential entrepreneurs. In any case, this approach aims at making best use of the existing distributors for mobilizing the household and cottage industries in the Province. In this regard direct involvement of the Provincial Government in terms of outlay of development funds will be quite small as compared to alternative I and II.

06.171 We feel that this approach too may function quite well by itself. However, if this approach is adopted as a supplementary strategy for either alternative I or II, it will make yield more results than otherwise.

6.6.5 Alternative IV: Development of Cilacap-Kebumen-Yogyakarta Economic Integration, and Cilacap-Purwokerto-Tegal Links

06.172 Relative priority in industrial development strategy may be shifted to make best utilization of Cilacap port's potential. Cilacap is certainly a big potential asset to Central Java which suffers from lack of good ports for large vessels. Although the Central Government gives high priority to development of Cilacap potentials, it seems quite dubious how strongly it committed itself to implementing development of Cilacap. The Provincial Government, thus, may be advised not to wait for action by the Central Government, and to make its own effort to develop Cilacap as a major industrial center in the Province.

06.173 It is one of the basic constraints to Cilacap development that Cilacap is poorly linked to the rest of Central Java and other provinces by road and railways. However, roads linking Cilacap to other areas are so-called "provincial roads". The Provincial Government, thus, may take initiatives in investing on infrastructure improvements linking Cilacap to the rest of Java Island; particularly toward Kebumen and Yogyakarta and toward Tegal. This will enable development hitherto relatively un-developed south coast and north-south link of Cilacap to Tegal. Investment in this road construction during Repelita III will definitely pay handsome benefits by attracting more large-scale investment to the Province.

06.174 Certainly detailed consultation with the Central Government is needed for developing Cilacap's industrial areas. But the Provincial Government should have already received some signs as to how the Central Government considers Cilacap, and these signs should be used for negotiating with the Central Government to get its decisive commitment on Cilacap.

06.175 We wish to repeat that the four alternatives envisaged are not mutually exclusive but more in the nature of complementarity to each other. In order to make progress in the development of the industrial sector in the Province it must be crucial to establish relative priorities of alternatives among them. In this regard we believe that alternative I is most realistic and must be given the highest priority among the four. Needless to say, the development of the industrial sector depends on the development of production-facilitating infrastructure on the one hand, and on an increase in supply capacity of raw materials from the agricultural sector on the other hand. Central Java Province has not yet achieved to any satisfactory extent these two pre-requisites for the industrial development. Therefore, a concerted endeavor has to be deliberately made by other sectors of economy in order that the Province may drive itself for further progress in its economic development.

6.7 Recommendations in Manufacturing

6.7.1 Improvements in Industrial Statistics

06.176 We noted repeatedly the deplorable quality of industrial statistics published by the Government of Central Java Province (and also by the Central Government). The extremely poor quality of industrial statistics in the Province can partly be attributable to the structure of the industrial sector of the Province. It is certainly difficult to collect reliable information from small-scale industries and even more difficult to do so from household and cottage industries. On the other hand, however, the quality of industrial statistics can be much improved by careful handling of primary data. If the grand total of rows totals is not equal to the grand total of column totals in a table, there must be some errors within the table. If a series of production figures jumps by 300 percent in one year, this discontinuity must be due to careless handling of numbers. If published statistical data includes errors, an errata sheet must be prepared. Unfortunately, there are far too many of these elementary mistakes in published official statistics. It is a matter of common sense that we can not make any realistic development plans without reliable statistical data, or with faulty and misleading statistical information. In this sense, we believe that it is an urgently required matter to improve the quality of industrial statistics in the Province. In this regard, we recommend to the Provincial Government to invite an expert in industrial statistics and utilize his or her service for up to 12 man-months in order to make a thorough review of the present methods of compiling industrial statistics, and draft a operable program for their improvement. And if necessary, drastic action, even firing or transferring the officers responsible, must be taken to strengthen the machinery for compiling industrial statistics of the Province. We are convinced that this should be given higher priority than other matters.

6.7.2 Intensive Action-Oriented Research for Promoting High Value Added Branches of Manufacturing in Small-Scale and Household Industries

06.177 In spite of the indisputable fact that small-scale and household industry occupies an important part of the economy of the Province, it is regreted to see that in the Province research results which could be of use in the promotion of those industries are astonishing small in number and poor in quality.

06.178 We have been repeatedly told that small-scale and household industries suffer from the triple problem of lack of capital, lack of technical skill and lack of experience in management. The triple problem is not only the problem in Central Java alone but it is a universal problem even found in developed countries. How to solve it however depends greatly on specific local conditions. It is because of this reason that well conceived action-oriented research into the problems