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MECHANISMS FOR SMALL-SCALE INDUSTRY DEVELOPMENT: ANCILLARIZATION - DEVELOPMENT OF FEEDER INDUSTRIES*

Prepared by the

Regional and Country Studies Branch

Division for Industrial Studies

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PREFACE

The Regional and Country Studies Branch of the Division for Industrial Studies, UNIDO, within its studies and research programme, is giving particular attention to the role of small-scale industry as important segment of the industrial sector development process in developing countries.

A special series of issue-oriented studies and analyses were carried out as preparation for an Expert Group Meeting on Policies and Strategies for Small-scale Industry Development in Asia and the Pacific Region. The meeting is organized jointly with the ESCAP/UNIDO Division of Industry, Human Settlements and Technology, and will be held in Seoul, Republic of Korea on 17-20 September 1985.

In this connexion a number of key issues were singled out:

- Firstly, existing small-scale enterprises have typically such low level of technology, unstandardized products and scant links with the existing large-scale enterprises, that they are active in a distinct area of the economy, which has little relation with modern industry and little autonomous prospects of growth and modernization;

- Secondly, small-scale industries like other industrial plants tend to be located in urban centres of growth, i.e., they concentrate around the capital city. Decentralization and dispersal of industrial activities are thus an essential development objective of Governments in many countries. Small industries are one particular group of industries subject to such policies;

- Thirdly, the small-scale industry sector is increasingly exposed to emerging new technologies. It has been well recognized that recent innovations, such as numerically controlled machines, computer-aided design or microprocessor-based information and control devices are potentially applicable to traditional producers.

The present study concerns the development of ancillary small-scale industries or feeder industries as an example of a programme towards systematic development of linkages between large- and small-scale industry. The study draws mainly upon the experiences of the Indian programmes in this respect. It has been prepared by Mr. Vinod Kumar Dhall, India as UNIDO consultant, in co-operation with staff of the Regional and Country Studies Branch.

Chapter I

THE ROLE OF SMALL INDUSTRIES IN THE INDUSTRIAL GROWTH OF DEVELOPING COUNTRIES

Industrialization is the sine qua non for economic growth in developing countries. The industrial development process must at the same time be linked with the growth of the other sectors of the economy. It is through industrial development that developing countries hope to be able to achieve an extension of employment opportunities, fuller utilization of human resources, productive utilization of the scarce capital resources and a general socio-economic progress. This may include equitable distribution of wealth, removal of regional disparities in growth, and conservation of foreign exchange resources. Obviously there are trade-offs and thus inconsistencies among these broad objectives at least in the short- and medium-term.

Small industries have acquired an important place in the industrial growth process of developing countries. Small industries are particularly able to contribute to the achievements of certain objectives. Some of the recognized benefits of small industries, particularly for developing countries, are their lower capital intensity and higher employment potential, their contribution removing regional disparities in growth, their mobilization of domestic entrepreneurial talent and small savings for investment and their exploitation of local resources of raw materials.

Due to such expected developmental advantages of the small-scale industry sector, special promotional efforts are pursued by governments of most developing countries. The support aims at assisting small industries to be able to survive and expand in spite of financial and other limitations. The support schemes provide protection and various development incentives to small industries including reservation of certain products for small industries production, provision of physical infrastructure and financial assistance on concessional terms, fiscal reliefs, training and consultancy service. In addition there may be special protective measures[1/] during crises caused by

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1/ As an example, see White Paper on Small and Medium Enterprises in Japan, 1983, Ministry of International Trade and Industry, Japan.

depressed economic conditions or violent market changes. In most countries, special organizations - have been entrusted with responsibility for promoting small industries.

Small industries have recorded substantial progress in a number of countries. For example, in India the number of small industries has grown from 60,000 in 1950 to 1,035,000 in 1982-83. During the 10-year period between 1973-74 and 1982-83 the production of small industries has grown from Rs. 72 billion to Rs. 350 billion, the employment provided by them has grown from 4.0 million to 7.9 million and their exports from Rs. 3.9 billion to Rs. 23,9 billion. Small industries together with village and cottage industries now account for 49 per cent of the industrial output in India and approximately 40 per cent of the industrial exports.

Chapter II

THE ROLE OF ANCILLARIZATION

For the process of industrialization in a country, small and large industries have to be viewed as mutually complementary and supportive. To integrate the development of both sectors, mutually advantageous linkages need to be maintained. One approach for ensuring the establishment of these linkages is the so-called ancillarization or development of feeder industries.

A. What is ancillarization?

Ancillarization denotes a close and abiding relationship between a small and a large industrial company wherein the small enterprise provides a substantial portion of its production of parts, components, sub-assemblies or services to the large enterprise (the parent) which uses these in the production process or the final product. It is to be noted that ancillarization is more than a mere vendor-purchaser relationship to the extent that the ancillary unit functions almost as a department of production within the parent unit. The parent unit not only assures offlift of a substantial portion of the ancillary production or services over an extended period of time at a fair, mutually acceptable price but also extends an umbrella of protection and support in the form of technical know-how, provision of drawings, training and so on. On the other hand, the ancillary unit is relying mainly on the parent unit for its sales and is also largely geared to the parent unit's requirement by way of quality, delivery schedules and so on. Thus, generally the ancillary is the supplier and the parent unit the buyer. The definition of an ancillary unit as accepted in India, is:

> "Undertakings having investment in fixed assets in plant and machinery held on ownership terms or by issue or by hire purchase not exceeding Rs. 25 lakh (Rs. 2.5 million) and engaged in:
>
> (i) the manufacture of parts, components, sub-assemblies, toolings or intermediates; or
>
> (ii) the rendering of services;
>
> and supplying or rendering, or proposing to supply or render, 50 per cent of their production or the total services, as the case may be, to other units for production of other articles.

Provided further that no such undertaking shall be subsidary of or owned or controlled by any other undertaking."

In India ancillary status requires that at least 50 per cent of the production of the ancillary unit must be supplied to the parent unit and that no ancillary can be a subsidary of or owned or controlled by any other undertaking. This condition is inserted with a view to prevent large industrial houses from exploiting the benefits given for ancillary units and restricting such benefits to genuine small enterpreneurs.

B. Benefits of ancillarization

Generally, ancillarization provides valuable support to the small-scale sector and is also benefical to the large industries. For the economic development process as a whole the following principal benefits can be mentioned:

One major macro-economic benefit of the small ancillary enterprises is that they are less capital intensive and have higher employment ratios than large enterprises and thus better correspond to the proper endowment in most developing countries. As a recent study[1/] indicated, fixed capital output ratios of the small enterprises and large enterprises in the automobile sector in India were 1:4 and 1:2.5 respectively. The same study found that the output per employee of the small enterprises and large enterprises in the automobile sector was Rs. 16,200 and Rs. 50,000 respectively and in the electronics sector Rs. 18,600 and Rs. 45,500 respectively.

The small ancillary units have also the advantage of greater flexibility of production enabling them to adjust easier to changing demand patterns. This flexibility also constitutes an advantage to the parent unit since it can more easily react to changing conditions than units depending wholly on in-house production.

The ancillary unit's small size usually enables it to have better supervision of the production process and greater efficiency in the use of

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1/ A Study of Ancillarization in Seven Industries, May 1980, Indian Institute of Management, Calcutta.

plant and machinery. This, combined with substantially lower overheads, can contribute to lower production costs. Whereas the technological gap is one of the major handicaps of the general small-scale sector, ancillarization can provide an important channel for transfer of technology and know-how to this sector.

Ancillarization furthermore can mobilize, generate and develop local entrepreneurship.

Besides these national benefits, various micro-economic advantages of ancillarization can be mentioned. The major benefit for the ancillary unit is the assurance of a secure market for its products. This enables the unit to sell its products without the difficult marketing efforts and to concentrate on other aspects of management.

For the large enterprise, farming out to ancillary units as against in-house production offers the following attractions:

- For a range of products, parts or components it is cheaper to buy than to produce.
- It gives greater maneuverability in case of diversifcation or changes in product lines.
- It enables the large enterprise to specialize on key items of production for which it has acquired the particular know-how.

The important role that ancillarization can play is increasingly recognized. In Japan, where sub-contracting (ancillary) industries have been systematically encouraged and have shown remarkable growth, it is officially recognized that "the small and medium sub-contracting enterprises formed a basis for the major industries which made large contributions in the postwar development of the nation's economy. From the standpoint of efficiency as well, the smaller sub-contracting business have played a vital role in the structure of division of labour and are an important factor in the high performance of the Japanese economy."1/

1/ White Paper on Small and Medium Enterprises in Japan, 1983, Ministry of International Trade and Industry, Japan.

In India an inquiry[1/] of a number of senior managers revealed that not a single executive disagreed with the basic assumption that ancillarization was desirable. This represents a change in the attitude of large enterprises from the earlier years. Indeed, in the past large enterprises tended to set up in-house production facilities for very broad ranges of items rather than trying to farm out the production of some of these items.

On the basis of the recognized benefits of ancillarization most Asian developing countries regard promotion of sub-contracting between small and large industries as an integral and important part of their policies and plans, special measures have been established to encourage ancillarization or development of, so called, feeder industries. These measures are called for to overcome prevailing difficulties of converging the short-term interests of large and small industries, overcoming the usual prejudices and hesitations, and making provisions for infrastructure and other requirements.

C. Growth of ancillarization - some examples

In Japan, ancillarization has been pursued as a constant policy objective over the last few decades. The sub-contractor ratio (share of sub-contracting businesses to total small and medium manufacturing enterprises) steadily increased from 53.3 per cent in 1966 to 65.5 per cent in 1981.[2/] Sub-contracting covers a wide range of Japan's industrial activities but is especially centered around the machinery, textile and metal industries. The sub-contracting ratio is particularly high in the transport, electric and other machinery industries where division of labour is practised at many levels, and in the textile industry. Trends in the sub-contracting dependency ratio (proportion of sub-contracting transaction to the total sales value of manufactured products) indicate that the proportion of business with a sub-contracting dependency ratio of 80 per cent or more in the total small and medium sub-contracting enterprises rose from an already high level of 81.3 per cent in 1976 to 82.4 per cent in 1981.

1/ A Study of Ancillarization in Seven Industries, May 1980, Indian Institute of Management, Calcutta.

2/ White Paper on Small and Medium Enterprises in Japan, 1983, Ministry of International Trade and Industry, Japan.

In India, consequent to continuous prodding from the Government, the public sector (state-owned) industries have taken a lead in ancillarization. This is specially so since 1978-79, when the Government strengthened its policy for ancillarization and issued comprehensive and detailed guidelines to the public sector enterprises. Consequently the number of industrial units registered as ancillary to such enterprises increased from 550 in 1977-78 to 1,153 in 1981-82. In addition, a large number of small industries are servicing state-owned enterprises. Their number have risen from 4,267 in 1977-78 to 7,068 in 1981-82. The value of total supplies from ancillary and other small industries increased from Rs. 805,7 million in 1977-78 to Rs. 2,330 million in 1981-82 and the employment provided by ancillary industries increased from 17,485 in 1978-79 to 26,702 in 1981-82. The growth profile of ancillary industries is given in the table below:1/

Ancillary industries in India

Year	Number of public sector enterprises reporting	Number of small scale or ancillary units			Employment in ancillary units	Total value of purchase from small scale or ancillary units (Rs. in millions)
		Small scale	Ancillary	Total		
1977-78	-	NA	550	550	NA	805.7
1978-79	73	4,267	805	5,072	17,485	964.4
1979-80	79	3,841	888	4,729	17,348	1,199.6
1980-81	80	4,340	984	5,324	23,772	1,519.0
1981-82	102	7,062	1,153	8,221	26,702	2,332.6

NA: Not available.

The level of ancillarization achieved in the private sector is, generally speaking, not on par with that in the public sector, although, the situation varies from industry to industry and from one large unit to another. Some companies have actively pursued ancillarization and achieved remarkable success

1/ Agenda Paper for Meeting of Small Scale Industry Sub Committee of Federation of Indian Chambers of Commerce and Industry, 14 November 1983.

in this direction. The position in some of the industry sectors is described below.1/

The automobile industry did not have ancillary units in the early stages of its growth. Today, however, a large number of small units exist which can meet the requirements of quality and delivery schedule of the large industry. The proportion of purchase from small industries varies between 9 per cent to 23 per cent of the total value of bought-out. Generally the small ancillary units supply higher proportion of relatively simple technology items. A study showed that there is potential for expansion of ancillarization and that many parent units are looking for more suppliers. Currently, the automobile industry in India is undergoing far-reaching changes; extensive modernization and diversification is being undertaken based on large investments in new technologies. In these developments ancillarization is playing a major role. Most large enterprises are basing their plans on extensive ancillarization. It is presumed that the positive experience of these large enterprises over the past years has contributed to this change in attitude in favour of greater ancillarization.

In the engineering industry, there are currently substantial linkages and scope for further large-small linkages in India. This fact can be said to be true for most other countries with a sizeable and growing engineering industry. There are, indeed, indications that the level of ancillarization is growing. The level of ancillarization in India in terms of ratio of bought-out to gross output and bought-out to total raw material consumption is 25 per cent higher than the national average and in terms of the ratio of bought-out to gross fixed assets is more than double the national average. Obviously the share of small ancillary units is particularly great in the case of simple technology items.

One example of ancillarization is the bicycle industry in North India. Some of the large bicycle manufacturers are located and the production is based upon hundreds of small manufacturers turning out parts and components for the parent units. There is an effective parent-ancillary relationship

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1/ Based mainly on: A Study of Ancillarization in Seven Industries, May 1980, Indian Institute of Management, Calcutta.

through which, inter alia, several common facilities for tooling, testing, etc. have been provided. The arrangement has clearly brought benefits to both the parent and ancillary units and has contributed significantly to the prosperity of the region.

In other industries like textiles, rubber and fertilizer, the level of ancillarization is rather low. The relatively low degree of linkages in the textile industry, is particularly surprising as India has a widespread cottage textile industry which could have enabled a widely ancillarized textile industry. For historical reasons, however, large textile plants are competitive with the small units, and could in fact push them out of the market. In order to protect and promote the small textile units the Government has taken a number of measures.

Chapter III

PROMOTING ANCILLARIZATION

A. Major constraints to ancillarization

As was described above ancillarization clearly has significant benefits for all concerned and these benefits are increasingly recognized. Many governments have therefore decided to actively support such development through a variety of measures, thereby attempting to alleviate major built-in constraints and obstacles to ancillarization.

From the view point of parent industries there are a number of problems in an ancillary relationship such as:

(i) Failure of ancillary units to adhere to quality requirements. This is especially true for precision machine parts where any weakness is likely to affect the performance of end products;

(ii) Failure to observe delivery schedules. This upsets the production programme of the parent enterprise and adds to inventory and other costs. This consideration is all the more important in the case of exports;

(iii) Problems of price fixation. Many large units feel that often small ancillary units are unable to maintain their costs at the minimum possible levels;

(iv) Continuity of management in ancillary units. Often a small ancillary unit is a one-man show and if a new person acquires control he may not have the same amount of knowledge or interaction with the parent unit.

On the other hand ancillary units usually face the following problems:

(i) Tentative ordering. Often the parent enterprise places orders for short periods of time which creates uncertainty and inefficiencies in the ancillary unit;

(ii) Delays in payment. This is a frequent complaint which seriously upsets the working of small units;

(iii) Pricing. Since the parent unit is usually in an advantageous position in relation to the ancillary unit it often adopts unfair policies in determining the price of the ancillary product or encourages unfair competition between various small suppliers. Some parent units scrutinize the cost element using industrial engineering

measures of pricing which are suitable for only large units and do not take into account various expenses of the small units. For example, in many developing countries small units have to incur extra expenses in obtaining licenses, quotas, import permits, etc. which escalate their costs;

(iv) Changes in personnel. Many small units experience absence of continuity in organizational support from parent enterprises which entails full commitment towards ancillarization. Changes in the staff in large enterprises they can lead to changes in motivations and attitudes of the parent company, in particular in the practices for purchases;

(v) Infrastructural inadequacies. Frequent infrastructural failures are not uncommon in developing countries such as break-downs in power supplies and unforeseen delays in transport, leading to interruptions in production runs, high inventories, and so on. These cause difficulties and misunderstandings between the parent and ancillary units;

(vi) Technological changes. The progress of technological innovation leads to frequent changes in process and products technology in large companies. These changes and adjustments in their production process, equipment, etc. have major implication for ancillary units which must allocate technological, managerial and financial resources to make the corresponding adjustments required.

(vii) Over-dependence of the ancillary unit on the parent unit can be detrimental to the development of the smaller unit being linked too closely with the large one. The problem is to ensure steady partnership with a sufficient degree of flexibility and with scope for dynamism in the small unit's development.

Many of these problems are problems of small-scale industry development in general. However, as can also be seen the actual establishment and operation of links between small and large companies in an ancillarization programme are confronted with particular constraints. These constraints broadly concern the identification of opportunities for such links, the motivation for their actual establishment and the operation and dynamic development of such inter-company relationship. Given the potential benefits that can be attained through ancillarization for the entire industrial development process of a country, many governments have established sets of promotional policies and measures to alleviate these constraints or at least to support companies in their endeavours to build-up linkages.

From the experience made so far in a number of countries some general lessons could be drawn as concern the design of the type of measures and their application conducive to ancillarization.

B. Promotional policies

The first level of policies concerns the creation of a macro-economic climate by which the advantages of ancillarization are appreciated by both large and small units and by which a general commitment towards ancillarization as a desirable objective is established. Real headway can be made only if such a favourable environment exists. In these general efforts to encourage ancillarization also private industries and their chambers and associations need to be fully involved and committed. The general measures should thus ensure that production through ancillary units, indeed is economically and commercially beneficial for the participating companies and that general constraints in this regard are removed.

Besides these general policy measures various specific measures which could be singled out as particularly important for promoting ancillarization. Such measures can be listed as follows:

(i) Certain industrial products can be reserved exclusively for production in the small scale sector. In India, for example, over 800 items are reserved for that purpose. Similar measures exists in Indonesia and some other countries;

(ii) The industrial licencing system can be used in a promotional way as in some developing countries, an industrial licence or permit is required before a large industry can be set up. In giving such licence or permit, conditions can be inserted which would discourage in-house production of selected items that would be suitable for production in ancillary industries. Thus, in India, it is required that industrial licence applications also indicate the potential ancillary production. The applications are examined and, where necessary, the matter is discussed with the applicants to arrive at pragmatic conditions which are then inserted in the licence;

(iii) Ancillary units can be made eligible for all facilities and incentives provided for small scale industries even when their size is bigger than normal small scale industries. For example, in India the investment limit for small scale industries is Rs. 2 million in plant and machinery whereas for ancillary units it is Rs. 2,5 million;

(iv) The tax structure could be designed so that production through ancillary units does not attract heavier tax liability than in-house production in the parent unit. For instance, sales by the ancillary to the parent unit of products for use in the final product of the parent unit should not be subject to sales tax or production tax. Often, parent units get 'job work' done at the ancillary unit, that is, they supply raw material or semi-finished products which are

processed at the ancillary unit and returned to the parent unit. In such cases, the sales tax or production tax, if any, should be levied only on the value added in the ancillary unit and not on the total value of the product finished at the ancillary unit;

(v) A number of large units have research and design facilities of their own to provide the necessary technical assistance to ancillary units. To encourage such assistance, the investment and expenditure made on R and D facilities specifically for support to small scale ancillary units can be granted special tax benefits;1/

(vi) Similarly, investment made by a parent unit towards infrastructural facilities, technical assistance and other measures for promoting ancillaries could be made eligible for tax concessions;1/

(vii) Special measures could be set up to ensure prompt payment by parent units for deliveries of the ancillary suppliers. Guidelines issued by the Government of India, for instance, to the public sector (state-owned) units provide that payment should be made within 30 days of delivery of goods2/. In Japan, a law regulates the prevention of delayed payments for sub-contracting under which the following obligations accrue on the parent enterprise:3/

(a) There should be a written order for the parent unit to specify the ordered work, the amount to be paid, the date and method of payment;

(b) The parent unit must not without warrant refuse delivery, fail to make payments, forcibly purchase off, setting of accounts before due date;

(c) If payment for work done is not complied by the due date, interest must be paid;

(d) The parent unit must pay for the work done by the sub-contractor within 60 days from the date of delivery of the processed articles;

1/ Report of Standing Committee of Ancillary Development and Marketing, June 1983 - Office of the Development Commissioner, Ministry of Industry, Government of India.

2/ In India an interesting suggestion has been made to set up a financial institution "which will be authorized to make payments to the small scale units on their bills more than 30 days old with a prima facie proof of the genuineness of the claim. The Negotiable Instruments Act should be suitably amended to enable this institution to recover its money from the company's banks with penality at the penal rate of interest in case of any delay. As a corollary, we recommend amending schedule six of the Companies Act to include the compulsory reporting of amounts outstanding to small scale units beyond 30 days. (A Study of Ancillarization in Seven Industries, May 1980, Indian Institute of Management, Calcutta.)

3/ Small Industry - The Challenge of the Eighties, by Dr. Ram K. Vepa.

(e) The Director of the Small Enterprise Agency has the authority to request the Fair Trade Commission to take recommendatory action;

(f) The Chairman of the Fair Trade Commission and the Director of the Small Enterprise Agency have the authority to direct the parent unit to submit accounts or to make spot checks;

(g) The Fair Trade Commission has the authority to ask the parent unit to make the payment immediately, and if it does not do so, to publicly announce it;

(viii) For compilation of statistical data as well as monitoring of progress at the macro- and micro-level, reporting of data is required from the industrial units. In India it has been recommended[1/] that at the stage of giving industrial licence or permit to a large unit it should be made conditional that the unit must report to the specified authorities on purchases made from the ancillary units. Another recommendation[2/] entails that schedule 6 of the Companies Act should be amended to require compulsory reporting of (a) the value of different categories of purchases (e.g. components, spares, services, etc.) made and the percentage from the small scale suppliers and (b) the percentage of total suppliers who are small scale suppliers.

(ix) Government can set up sub-contracting exchanges to assist small scale units in securing sub-contracting jobs from large and medium undertakings in the country. In India, 16 such exchanges have been set up. These exchanges invite small scale units to register spare capacity of their specific machines, approach large industries to list items which can be manufactured in the small scale sector, render technical assistance to small units and furnish information to them as well as to the large industries. These exchanges on an average assist more than 5,000 small scale units per annum. The value of the orders secured by small scale units through these exchanges in 1978-79 exceeded Rs. 653,6 million.[3/] Similar sub-contracting plazas have been set up in Japan.

(x) Conferences and exhibitions regarding ancillarization is a further promotional measures. Products suitable for ancillarization in several large units can be displayed and on-the-spot consultancy service offered to parties interested in supplying or manufacturing them as sub-contractors. Large units can also be encouraged to set up permanent exhibitions of such products.

1/ Report of the Standing Committee on Ancillary Development and Marketing, June 1983, Office of the Development Commissioner for Small Scale Industries, Ministry of Industry, Government of India.

2/ A Study of Ancillarization in Seven Industries, May 1980, Indian Institute of Management, Calcutta.

3/ Small scale industry in India: Policies, programmes and institutional support, September 1980, Development Commissioner for Small Scale Industries, Ministry of Industry, Government of India.

(xi) Government could arrange infrastructural support to enable ancillary units to be established. For instance, integrated industrial estates can be set up in the vicinity of large units which should include facilities like developed land, factory buildings, power supply, water supply, banking facilities, common testing centres, common tool rooms, raw materials bank, training centres, and so on. Some surveys indicate that large industries clearly prefer to have ancillary units in their vicinity to facilitate effective supervision, timely delivery etc. Financial assistance on resonable terms for financing fixed investment as well as working capital could also be provided by the financial institutions and banks.

(xii) Another useful measure is suggested by the 'nucleus plant' concept in India. This concept has been adopted as official policy under which the Government has decided to promote the establishment of large plants in backward areas which would act as nuclei around which smaller ancillary units would be promoted. These 'nucleus plants' would concentrate on assembling the products of the ancillary units falling within their orbit or producing the inputs needed by a large number of smaller units and making adequate marketing arrangements. The nuclei will also ensure a widely spread pattern of investment and employment and will distribute the benefits of industrialization to the largest extent possible. The nucleus units would also work for upgrading the technology of small units. The 'nucleus plants' are made eligible for enhanced incentives from the Governement.1/

C. Administrative and operational support to ancillarization

Apart from the general policy framework and specfic promotional measures also administrative and operational measures could be designed to facilitiate the establishment of ancillary units around suitable large industries. Such measures cover action by various bodies, such as promotional agencies, industry association and chambers as well as individual companies. The following measures could be considered:

(i) Suitable industrial sectors which offer good potential for ancillarization could be identified. Within these sectors, individual units could be found which would have scope for setting up ancillary industries. For selected industrial units, suitable items for production in ancillary industries would be selected. Some useful criteria for selection of items are:

(a) The technology should be comparatively simple;

(b) The capital investment required should not be too large for a small scale unit to be set up;

1/ Industrial Policy Statement, July 1980, Ministry of Industry, Government of India.

(c) The requirement of individual items should be large enough to sustain a viable ancillary unit;

(d) Items being presently imported usually offer good scope for ancillarization subject to the other conditions above being met.

The technical and other specifications of the identified items should also be laid down.

(ii) Pre-feasibility studies for the proposed ancillary units would have to be prepared to assess their potential techno-economic viability before further steps are taken for their establishment. These studies may be prepared by public or privately supported consultancy organizations, financial institutions or by the parent unit.

(iii) For establishing the identified, potentially viable units, suitable entrepreneurs would need to be identified. For this purpose, the items of procurement - along with quantities and specifications - should be well publicized and the pre-investment studies should be made available to interested persons. Suitable criteria for selection should be laid down, such as technical competence and experience, commercial and managerial ability, and ability to raise financial resources. In a study[1/] which probed into the criteria used for evaluating potential small-scale producers, large-scale respondents were asked to rate the following criteria that ranged from "always a reason for preference" to "never a reason for preference":

(a) Supplier's market reputation for quality;

(b) Supplier's ability to offer the lowest price with acceptable quality;

(c) Supplier is a small scale unit;

(d) Vendor's proximity to the large plant;

(e) Apparent technical ability of vendor;

(f) Vendor has supplied the organization in the past;

(g) Any other factor.

The responses exhibited a clear trend. The apparent technical ability and the supplier's reputation for quality were ranked the highest with the supplier's ability to offer the lowest price being ranked second. Proximity of the supplier was considered necessary or desirable by all the respondents.

In some organizations, employees or former employees of the parent unit are regarded as good candidates for setting up ancillary units as they are expected to have experience and technical competence as

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1/ A Study of Ancillarization in Seven Industries, May 1980, Indian Institute of Management, Calcutta.

well as loyalty to the parent unit. (In some other places, however, this practice is discouraged as it is felt that it leads to unhealthy competition and other complications within the parent unit.) Co-operative societies of employees or former employees can also be formed into ancillary units. In an Indian motor-cycle enterprise, that presents a pioneering and highly successful case of ancillarization, employees have been encouraged to take up ancillary units individually or through co-operative societies set up for this purpose.

(iv) Provision could be made for the supply of technical know-how and training by the parent unit not only initially but on a continuing basis. This includes advice in the selection of plant and equipment, supply of drawings and technical data, and process know-how and tools. An illustrative example can be given in this regard: the above mentioned motor-cycle enterprise in India organized a study tour by existing and prospective ancillary units to Japan.

(v) Parent units should attempt to enter into long-term contracts with ancillary units and make arrangements for prompt payments. The procedure for inspection of supplies should also be streamlined to avoid delays.

(vi) To the extent possible physical infrastructural facilities may be made available by the parent unit in its vicinity to facilitate quick establishment of the ancillary units.

(vii) Parent units should have a formalized process for facilitating the establishment and smooth running of the ancillary units. It has been found that the best results are achieved where such a formalized process exists along with organizational commitment to ancillarization. It is useful to assign to a special officer at a reasonably senior level the responsibility for ancillary development.

(viii) A joint involvement of the parent unit, governmental promotional bodies and financial institutions in the entire process of selection and establishment of ancillary units could be a useful measure. It would give the process and the decisions wide acceptability among all concerned organizations and would facilitate the co-ordinated and timely availability of the various requirements of the ancillary units, e.g. loans from financial institutions, physical infrastructure from governmental bodies, and training and technical know-how from the parent unit.

In many developing countries the public sector has an important position in industry. In some countries certain industrial products are reserved for production in the public sector and large industrial projects especially in the basic and heavy industries are often being promoted by state-owned companies. The public sector industries are expected to set an example in policies which have broader socio-economic implications. Hence also in regard to ancillarization, these industries can take the lead with suitable support

and guidance from Government. To this end specific and detailed guidelines could be issued for these industries to ensure general compliance with the policy as well as a broad uniformity of approach and procedure amongst different public sector enterprises. Such guidelines was issued by the Indian Government to the public sector enterprises in 1971. Based on the experience gained over the years and the concensus arrived at in an important conference of the public sector enterprises, a revised comprehensive set of guidelines was issued in 1978.[1/] These guidelines were found to have helped in giving further stimulus to ancillarization which has been reflected in the growth of ancillary units around public sector enterprises since 1978-79. It would be useful to describe the broad features of these guidelines and these are therefore given in Annex I.

1/ Circular to public sector enterprises dated 5 May 1978 from Bureau of Public Enterprises, Ministry of Finance, Government of India.

Chapter IV

PROSPECTS FOR ANCILLARIZATION IN THE DEVELOPING COUNTRIES IN ASIA AND THE PACIFIC REGION

A. Emerging industrial policies

In the past decade, industrialization has been the key sector in the economic development of the developing countries of Asia and the Pacific region. Between 1973-1982, manufacturing value added (MVA) per capita in the region grew 4.7 per cent as compared with the average rate of 2.1 per cent for all developing countries. The industrial growth rate exceeded that of GDP and the share of MVA in total GDP increased from 12.8 per cent in 1963 to 18.9 per cent in 1980.

It is expected that Asian countries will continue to attach high priority to industry in their economic development. In the future industrialization process government policy-makers are likely to give new or increased emphasis to some key issues of development.

Firstly, many of the developing countries in the region recognize that the benefits of industrial growth have not spread to the population at large and it has been largely restricted to bigger metropolitan centres with few linkages to other economic sectors. Secondly, it has envisaged, particularly in some of the fast-growing southeast and east Asian countries, that the domestic demand dynamics for development has been neglected in preference for export markets and that an overdependence on imported technologies and capital goods has developed. Of particular concern, especially to the larger south Asian countries, is the limited effect that industrial growth has had towards alleviating unemployment. This is partly attributed, to the use of capital intensive technologies and to the weak linkages between large and small industries.[1/] It can be expected that in the coming years, increasing importance will be attached to:

- geographical dispersal of industries through encouragement to large industries to locate away from metropolitan centres;

1/ "Development Strategies for the 1980s in South Asia", ST/ESCAP/154.

- manufacture of capital goods and intermediate goods through an expansion of heavy engineering industries;

- processing of domestic raw material resources;

- selection of technologies favouring, more employment intensive technologies.

- more equitable distribution of income.

Broadly speaking, increasing emphasis will be given to converge the needs and contributions of rural and urban populations and to achieve growth and social equity through a coherent development process. Governments are likely to foster demand and supply relationships between the large and small industries.[1/] These considerations will generate not only vast opportunities but also the necessity to build ancillary industries around large units, especially those situated or coming up in non-metropolitan or rural areas.

In some countries public sector industries, especially in the basic industrial sectors, can be expected to expand further so as to fill major gaps in the industrial structure, poineer the development of backward regions and foster inter-sectoral linkages.

The endeavoured changes in the pattern of industrial development in the region point to the central importance that is being attached to increased national integration of industries and to the development of small-scale enterprises including new types of small-scale activities. This means that ancillarization will need to be increasingly promoted and supported.

B. Some fields and products suitable for ancillarization

Considering the diversity of the economies of the developing countries in Asia and the Pacific region the various industrial structures will not have the same potential for ancillarization. Basically it can be deduced, however, that the various sub-sectors of the engineering industry generally provide wide scope for setting up ancillary industries. This is also true of the

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1/ "Industrial Strategies and Policies in Developing South, South-east and East Asia: A Review", UNIDO/IS.412.

automobile and other transportation industries and communication industries. On the other hand processing industries like paper, glass and rubber have a low potential for ancillarization. Service industries also offer scope for ancillarization, for example the printing and packaging industries. A study[1/] on prospects for ancillarization in India identifies the following areas:

	Potential ancillarization range (per cent)
Transportation	60 - 90
Communication	50 - 75
Prime movers and power-based industries	30 - 50
Consumption goods and consumer durables (household, office and commercial)	10 - 30
Industrial machinery and machine tools	20 - 40
Chemicals and pharmaceuticals	15 - 30
Basic industries (metals, minerals, cement and petroleum)	5 - 10
All other industries (wood, paper, fibres, glass, ceramics, leather and rubber)	2 - 10

Among specific industrial products, for which (large-scale) manufacturing offers significant scope for setting up ancillary units following may be mentioned:

Heavy electrical equipment
Pumps and compressors
Heavy fabricated equipment for industries
Machine tools
Heavy steel structures
Refrigerators
Bicycles
Tractors
Motor cycles and scooters

1/ Source: Laghu Udyog, 1981, Ministry of Industry, Government of India.

Cars

Shipyards

Aeronautics

Telephones

Printing

Petro-chemicals

Photocopiers

Electronics

Steel plant.

Listings of some items that may be suitable for ancillary production around the large scale manufacturing indicated above are given in Annex II. These lists are based upon the ancillary units established around such industries in India or advertised for ancillarization by such industries. (The items are given by way of illustration and do not purport to be an exhaustive compilation.)

Chapter V

CONCLUSIONS

Emperical evidence and indications of emerging policies for industrial development show that small scale industries and their promotion occupy an important place in the industrialization strategies and policies of most developing countries. To attain a pattern of well structured and integrated industrial development, mutually supportive linkages need to be established between large and small industries. One way of serving this objective is ancillarization or the establishment of, so called, feeder industries.

Ancillarization denotes a close, continuing and relatively formalized relationship between a large parent unit and a small ancillary unit in which the latter acts as a supplier of products or services required by a large unit. Ancillarization has a number of advantages which serve both macro-economic and social goals of a country, as has been demonstrated by the experiences of some countries.

The establishment and operation of ancillarization faces various problems in implementation. These problems face both large industries and small industries in the parent-ancillary relationship. While these difficulties should not detract from the overall advantages of ancillarization they must be duly considered in evolving and implementing policies for promoting ancillary industries.

The basic thrust for promoting ancillarization has to come from the national Government which should secure the co-operation of indus s in the public and private sectors and their relevant associations and ch . An environment favouring ancillarization and a suitable policy framew s is required to enable the growth of ancillary industries. Appropriate administrative and operational measures should be given due emphasis within such an overall policy framework to secure progress in the direction of ancillarization. Where public sector is present it may act as a leader and trend-setter in the growth of ancillary industries. Government can issue a set of clear guidelines to the public sector enterprises for this purpose.

Considering the emerging industrial growth pattern of the developing countries of Asia and the Pacific and the socio-economic priorities that are expected to be assigned in the future, there is both the potential and the need for developing effective linkages between the large- and small-scale industry sectors. In that context the potentials for widened ancillary industry development need to be assessed. Apart from the existing large plants, new industries organizing their production in the context of new emerging technologies, would offer scope for establishing ancillary or feeder industries.

In pursuing the ancillarization efforts in the developing countries of Asia and the Pacific region, the experiences described in this paper, as well as the policy framework and the administrative and operational measures suggested in this paper can be of relevance. The levels of possible ancillarization vary from one industrial field or product to another. Hence relevant industrial fields and products would need to be identified. By way of illustration some suitable industrial fields and products as well as some items for ancillary production have been indicated in this paper and its Annex II.

Annex I(1)

MAIN FEATURES OF THE GUIDELINES ISSUED TO PUBLIC SECTOR ENTERPRISES IN INDIA FOR ENCOURAGING ANCILLARIZATION[1/]

1. Ancillarization should be adopted as a corporate policy by the public sector enterprise. Its initiation and implementation should be continuously monitored by the Board of Directors.

2. A senior officer of the enterprise should be designated as Ancillary Development Officer and should be primarily responsible for developing and assisting ancillary industries.

3. There should be periodic prescribed reporting to Government on the progress relating to ancillarization.

4. For both existing as well as new enterprises a careful study should be made to identify items whose production can be farmed out to ancillary units. In the case of new enterprises this should be done at the conceptual stage itself and should be included in the project or feasibility studies.

5. Feasibility studies to establish the techno-economic viability of proposed ancillary units for manufacture of identified items should be drawn up by governmental promotional organizations in consultation with the public sector enterprise.

6. An Ancillary Development Advisory Committee (Plant Leve Committee) shoul dbe set up under the chairmanship of the Chief Executive and should include representatives from governmental promotional bodies and ancillary units. This committee would actively advise regarding selection of entrepreneurs, training, pricing and so on.

7. Suitable entrepreneurs should be selected jointly by governmental promotional bodies and the enterprise through a well advisertised selection procedure.

1/ Circular dated 5 May 1978 from Bureau of Public Enterprises, Ministry of Finance, Government of India.

Annex I(2)

8. Selected entrepreneurs should be provided training by the enterprise as well as designs, process know-how and other forms of technical guidance.

9. The enterprise should attempt to enter into long-term purchase contracts with ancillary units and guarantee offtake of at least 50 per cent of the ancillary units' production for a reasonable period of time to cover the development phase and beyond.

10. In case of change or diversification in the product lines of the parent unit, adequate notice might be given to ancillary units. Where product development costs have not been recovered by ancillary units, suitable compensation may be conisdered in subsequent orders. The necessary technical know-how and training may also be imparted in relation to the new products.

11. Inspection of the ancillary unit's production should as far as possible be done in the ancillary factory to avoid delays in approval or rejection of the goods.

12. Payment to the ancillary units should be made usually within 30 days.

13. No charges by way of earnest money security deposit, cost of tender forms, etc. should be taken from the ancillary units.

14. The public sector enterprise should attempt to supply suitable infrastructure for the establishment of ancillary units. In the case of new public sector enterprises this infrastructure should be planned at the initial stage of the project itself.

Annex II(1)

LISTING OF ITEMS SUITABLE FOR ANCILLARY PRODUCTION

A. HEAVY ELECTRICAL EQUIPMENT

Non-metallic items

1. Woven asbestos tape
2. Nylon tape (untreated)
3. Terylene tape (untreated)
4. Resin glass tape
5. Black varnished cotton tape
6. Terylene cloth (untreated)
7. Black varinshed cotton cloth
8. Phenolic paper
9. Fibre glass tubes
10. Porcelain insulators
11. Terminal porcelain
12. Shellac bond powder
13. Cross jet pot body
14. Makrolon covers
15. Anti-vibration mounting

Electrical items

16. Differential pressure gauges
17. Reflex type water level gauges
18. Flow indicators with alarm
19. Pressure switches
20. Oil level gauges
21. Asbestos covered conductors
22. Varnished glass braided enamelled copper and aluminium conductors
23. Level indicators
24. Expulsion fuses
25. Bolt heaters

Annex II(2)

Mechanical items

26. Sintered arcing contact
27. Moving contact
28. Ermeto pipe couplings
29. Oil pubp for E.M.U.'s
30. Gun metal globe relief valves
31. Lubricated needle valves
32. Water expansion relief valves
33. Valves and cocks
34. Helicoil inserts
35. Forged and hot rolled coppering
36. Springs
37. Guide bearing pads
38. Thrust bearing pads
39. Positive lock washers
40. Slot wedges
41. Conduit fittings
42. High pressure angle valves-panel mounted
43. Safety valves
44. Kinetic air valves
45. Solenoid valves 2 and 3 way
46. Oil filters
47. Precision steel castings
48. Brush holders.

B. PUMPS AND COMPRESSORS

1. Sleeves
2. Central bushings and spacers
3. Base/base plates'Barrels
4. Barrels
5. Discharge heads
6. Shafts/line shafts
7. Suctions and delivery flanges

Annex II(3)

8. Stuffing box assemblies
9. Bearing covers
10 Couplings
11. Flanges and plates
12. Filters
13. Coolers
14. Column pipes
15. Guards
16. Lubrication oil system
17. Gas coolers
18. Pulsation dampers
19. Volume bottles
20. Separators
21. Condensation chambers
22. Pipe fittings
23. Distant pieces
24. Bushes
25. Keys and pins
26. Gland packing
27. Gaskets
28. Caps and covers
29. Pulleys
30. Liners
31. Valve discs
32. Valve bodies
33. Valve plungers
34. Fasteners like nuts, bolts, washers, screws and sturds

C. HEAVY FABRICATED EQUIPMENT FOR INDUSTRIES

1. HT and HR fasterners
2. Shells for heat exchangers
3. Name plates
4. Saddle column trays, tray supply rings, bubble caps and miscellaneous fabrications

5. Gaskets
6. Gray iron castings
7. Dished ends
8. Forgings
9. Pipe bends
10. Chlorine cylinders
11. Ancillary machine shop
12. Precision products and tool room
13. Machining and drilling of flanges.

D. BICYCLES

1. Fork column liners, fork top liners, fork bridges, fork lug rings
2. Handle lugs, fork lugs, pedals and plates and steel washers
3. Tool room with heat treatment
4. Crank polishing
5. Handle polishing
6. Rim polishing
7. Frame bolts, seat pillar bolts, chain stay bolts, bar bolts, cotton pins
8. Brake adjusters, brake clips, brake shoes, reflector screws, chain adjusters
9. Corrugated rolls and wrapping papers
10. B.B. shells
11. B.B. cups
12. Pedal axle, exp. bolt.

E. TELEPHONE INDUSTRY

1. Phase locked microwave source
2. Invar filters
3. Isolators and opto-isolators
4. Circulators and iso-circulators
5. Demodulators
6. Mica and mylar resistance strips
7. Transformers
8. Klystron, with and without cavity

9. Invar rods and tubes
10. Microwave frequency adopters and receptacles
11. Enamelled resistance wire (cupro-nickle type)
12. Single silk/rayon enamelled resistance wire
13. Enamelled copper wire
14. Wire wound resistors
15. Crystals and crystal ovens
16. Discrepancy switches
17. Thermistors
18. Capacitors
19. Transistors
20. Diodes
21. Plugs
22. Relays
23. Reed contacts
24. Integrated circuits
25. Travelling wave tubes
26. Ferrite pot cores, spools, slugs
27. Laminations (permalloy)
28. Potentio-meters
29. Selecto-insulators
30. Electric wire wrapping tool and accessories
31. Miniature circuit breakers
32. Jack mounting
33. Maintenance tools and gauges

F. PETROCHEMICALS

Chemicals

1. Antioxidants
2. Antifoam agent, foaming agents
3. Antiblock agents
4. Optical brightners
5. Pigments used in the polymer field

6. Cobalt octoate
7. Alkylated triphenyl phosphate
8. Monoethyel hydroquinone
9. Vinyl acetate
10. Various additives.

Engineering

11. Plastic processing machineries
12. Moulds and dies for plastic industries
13. Remetalizing industry
14. Valves fabrication
15. Pipe fabrication
16. Castings (pump castings, valves, base plates, mountings)
17. Rubber goods
18. Plastic reinforced goods
19. Auto garages
20. Drums; barrels
21. Electrical windings
22. Explosition-proof lighting fittings
23. Hydrocarbon vapours
24. Explosion-proof gear head motors
25. Special motors
26. High quality valves
27. High quality fittings
28. Explosion-proof switches; terminal boxes.

Safety items

29. Safety helmets
30. Firefighting equipments
31. Safety aprons
32. Caps and blankets
33. Gas detectors
34. Safety goggles

35. PVC and rubber gloves
36. Asbestos suits
37. Safety torches
38. Face shields.

Engineering services

39. Services for turbines and compressors
40. Services for refractory jobs and insulators
41. Services for other specialized machinery and equipments, centrifuges, pressure vessels, etc.

G. PHOTOCOPIERS

1. Printed circuit boards (both bare-board and assemblies)
2. Sheet metal parts
3. Castings and subsequent machining
4. Plastics and rubber moulded parts
5. Packaging material including polyurethane foam moulded sections and corrugated paper or cardboards
6. Transport and logistics of material movement and warehousing
7. Machine components.

H. STEEL PLANT

1. M.S. washers
2. Machine bolts and nuts
3. Nuts, bolts and rivets
4. Steel balls and hammers
5. Antifriction bearings
6. Gears and gear boxes
7. Forging and machine shop
8. Steel foundry
9. Ferrous foundry
10. Malleable foundry
11. Non-ferrous foundry

Annex II(8)

12. Pumping sets
13. Crane parts and hoists
14. Mobile equipment parts
15. Lancing pipes
16. ERW pipes
17. Jobbing workshop
18. Accessories of machine tools
19. Cutting tools
20. Redoxide paint
21. Ready mixed paint
22. Aluminium paint
23. Soaps
24. Pipe fittings and valves
25. Wire nails
26. Portable tools
27. Wood screws, machine screws
28. Jacks
29. Aluminium notched bars
30. Aluminium shots
31. C.I. spun pipes
32. Sanitary fittings
33. Fittings for doors and windows
34. Fabrication of building structures
35. Caustic soda
36. Slag wool
37. Resins
38. Redoxide
39. Polythene lines gunny bags
40. Coal tar paints and corrosion resistant paints
41. Tarfelts
42. Contacs for contractors, straters, relays and circuit breakers
43. Coil for above
44. Carbon brushes
45. Brush holder
46. Instrumentation: (a) circular chart (b) rolled charts

47. Current collectors and trolley holders; and wiring contacts
48. Springs for brush holders; contractors, circuit breakers, etc.
49. Moulded bakelite parts for terminals, switches and contractors
50. Porcelain insulators for bus bars, terminals and switch gears
51. Cable lugs
52. Small low voltage transformers and chokes for rectifiers, amplifiers, stabilisers and other electronic circuits
53. Pigmy lamps
54. Resistance grids, vitreous enamel resistors, wire wound resisters, toroidal resistors
55. Repair of accumulators, ceiling fans, water coolers, refrigerators, air conditioners, etc.
56. Repair of gas torches
57. Aluminium die casting, overhead line conductors and accessories
58. Workshop items
59. Hand gloves; other safety appliances
60. Wire rope slings
61. Foundry chemicals
62. Refractory bricks (other than fire clay).

I. PRINTING

1. Mechanical spares and components
2. Steel rollers
3. Electrical spares and components
4. Rubber spares and components
5. Rubber rollers
6. Hard chrome plating
7. Copper platting.

J. HOTELS

1. Crockery (superior quality)
2. Heat resistant glassware
3. Equipment like ice cube making machine

4. Ovens
5. Vacuum cleaners
6. Floor polishers
7. Dish washing machines
8. Glass washing machines
9. Tea and coffe making machines
10. Paper towels, toilet rolls, plate holders, etc.
11. Piped in music equipment
12. Cutlery
13. Soaps, shampoos, dishwashing soaps, etc.

Annex III

LIST OF MAIN REFERENCES

1. White Paper on Small and Medium Enterprises in Japan, 1983, MITI Information Office, Ministry of International Trade and Industry, 3-1, Kasunigaski 1-Chome, Chiyoda-ku, Tokyo 100, Japan.

2. A Study on Ancillarization in Seven Industries, May 1980, Indian Institute of Management, Calcutta, India.

3. Agenda paper for the First Meeting on 14 November 1983 of the Small Scale Industry Sub-Committee of the Federation of Indian Chambers of Commerce and Industry, Federation House, Tansen Marg, New Delhi, India.

4. Report of Standing Committee on Ancillary Development and Marketing of the Small Scale Industry Board, Office of the Development Commissioner for Small Scale Industries, Ministry of Industry, Government of India, Nirman Bhavan, New Delhi, India.

5. Small Industry - The Challenge of the 80s by Dr. Ram K. Vepa, Vikas Publishing House Pvt. Ltd., 5, Ansari Road, New Delhi, India.

6. Small Scale Industries in India - Policies, Programmes and Institutional Support, September 1980, Development Commissioner for Small Scale Industries, Ministry of Industry, Government of India, Nirman Bhavan, New Delhi, India.

7. Industrial Policy Statement, July 1980, Ministry of Industry, Government of India, Udyog Bhavan, New Delhi, India.

8. Circular Letter dated 5 May 1978 issued to all Public Sector Enterprises by the Bureau of Public Enterprises, Ministry of Finance, Government of India, Mayur Bhavan, New Delhi, India.

9. Laghu Udyog, 1982, Ministry of Industries, Government of India, Udyog Bhavan, New Delhi, India.

10. Development Strategies for the 1980s in South Asia, ST/ESCAP/154, Bangkok, Thailand.

11. Industrial Strategies and Policies in Developing South, Southeast and East Asia - A Review, UNIDO/IS.412, UNIDO, Vienna, Austria.