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The World Bank
1818 H Street NW
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CHANMIGAN

THE ROLE OF THE INTERNATIONAL FINANCE CORPORATION IN
PROMOTING INDUSTRIAL VENTURES IN DEVELOPING COUNTRIES

An information paper presented by Dr. J. Chammugam
on behalf of the International Finance Corporation
to the United Nations Inter-Regional Conference on
the Development of Petrochemical Industries in
Developing Countries --

Tehran, Iran, November 15-30, 1964

David Grenier
Office of Information

The industrial revolution now taking place in Asia, Africa and Latin America has emphasized the need for financial institutions capable of mobilizing resources for risk ventures in developing countries. Awareness of this need has grown more acute as many of these countries take stock in their development plans of the opportunities as well as the gaps that exist in their economies. Specialized merchant banking institutions or banques d'affaires have had considerable experience in promoting new enterprises and facilitating the expansion of existing companies in Western Europe and North America. But the terrain is less familiar in the developing countries and the problems are likely to be correspondingly greater. Such resources as equity capital, as well as production, marketing, accounting and other management skills are relatively scarce. In addition, social and political factors -- such as government policies regarding domestic control of industry or exploitation of natural resources -- must be taken into account.

In this context, the International Finance Corporation, an affiliate of the International Bank for Reconstruction and Development, has a unique role in stimulating industrial enterprise in the private sector of developing countries. IFC came into existence in July 1956 when 31 member countries provided capital subscriptions totaling \$78 million and thereby fulfilled the membership requirements of the Articles of Agreement. As of June 30, 1964, IFC's membership had risen to 78 countries and its paid-in capital to nearly \$99 million.

To date, IFC has made over 90 commitments in 30 different countries in six continents. Its investments have centered on manufacturing and processing industries including steel, pulp and paper, textiles, chemicals, fertilizers and construction materials. Although IFC may consider agricultural or service projects in connection with manufacturing enterprises, it excludes

such fields for investment as service industries (for example, tourism) as well as public utilities, real estate development or land reclamation. As of the end of September 1964, IFC's gross commitments totaled \$122.7 million. Net of cancellations and terminations, the total was \$111.5 million.

In order to accomplish its aim of spurring productive private enterprise in developing countries, IFC considers investment proposals in the light of whether a given project will make an effective contribution to the development of a country's economy. A project should not involve wasteful use of resources, nor should the costs be excessive in relation to the benefits that can be expected to result from the project. As guide lines for decisions of policy, IFC has established five basic criteria:

- is there an adequate market for the product?
- is the project technically well-conceived?
- is management capable and experienced?
- is the capital structure of an enterprise or project sound?
- is there a prospect of profitable operation?

In effect, the establishment of these criteria means that while IFC is called on to review a wide range of investment proposals, actual commitments are only made after careful selection and preparation of projects. In establishing the need for, and desirability of, an investment commitment, the Corporation acts as a lender of last resort: it must satisfy itself that sufficient private capital is not available on reasonable terms for a venture. Since its aim is to stimulate private investment, it requires that other investors put up a large portion of the funds required. In the case of a new enterprise, it expects its own participation to be less than 50 per cent of the capital cost, although it is prepared to waive this

condition in cases where an existing enterprise is expanding. As this indicates, IFC does not aim at acquiring the controlling interest in enterprises in which it invests, nor does it seek to provide management. Except when circumstances compel it to do so, the Corporation normally does not exercise the voting rights of the stock it holds.

In most respects, IFC behaves much like a private investor. It does not expect or seek special foreign exchange privileges. Nor does it ask government guarantees on its investments. Since it was formed to deal specifically with private enterprise, it does not, as a practice, invest in undertakings which are government-owned or controlled. While this does not exclude enterprises in which some public funds have been invested, IFC's judgment in these situations is based on whether the enterprise concerned is essentially private in character.

There are several restrictions on where and how IFC may make investments. In the first place, its operations are confined to projects in its member countries and their territories. Under its charter, it is not permitted to make an investment in a member country if the government of the country concerned objects. IFC's practice is therefore to inform a member government in advance of its intention to make a commitment in the country concerned. As a matter of operating policy, the Corporation does not invest in the more developed of its member countries -- in the main, Western Europe, Japan, Canada or South Africa -- although it has made commitments in Southern Italy, Spain, Greece, Turkey, Finland, and Australia.

While IFC's terms of reference are wide as far as financing goes, it does not as a matter of policy engage in export financing, installment credit or mortgage lending. Initially, under the terms of its charter, the Corporation was permitted only to provide loan capital, usually with some

special equity feature -- such as an option to acquire stock -- which allowed it to share in the growth of a business. Experience showed that this policy had decided limitations since the real shortage in many developing countries is equity rather than loan capital. Because of this shortage many new companies in developing countries find themselves burdened with heavy debt charges before they have built up earning capacity. Over-dependence on short-term credit and shortage of permanent working capital also create stringencies for companies in the process of establishment or expansion.

It was the realization of these problems, and the desire to place the Corporation in a position where it could help meet them, which led to amendment of IFC's charter in 1961, permitting it for the first time to provide straight equity or a combination of loan and equity funds as the situation demanded. The record of operations during the last three years has shown the increasing number of opportunities opened up as a result. In its most recent fiscal year (1963-64), more than half IFC's investments were -- for the first time in the Corporation's history -- in the form of subscriptions to capital stock rather than in loans. At June 30, 1964, the proportion of its portfolio invested in equity stood at 30 per cent, compared with 17 per cent twelve months earlier, and this proportion is expected to rise in the years to come.

The commitment of its own resources is not IFC's only function in the area of financing. Its charter directs it to seek to stimulate the flow of private capital -- both domestic and foreign -- into productive investment. In meeting these conditions, IFC has been able to assist in financing enterprises which have required as much as \$80 million in capital funds to come into operation. One of the principal ways in which it has achieved this has been by working closely with other financial institutions.

In the 1963-64 fiscal year, for instance, IFC's commitment of \$21.8 million in 18 different enterprises was joined by commitments by other investors totaling more than \$144.5 million -- a ratio of \$7 to every \$1 committed by IFC. More than 40 different institutions, domiciled in France, Germany, Hong Kong, Italy, India and Japan, among other countries, joined IFC in these direct financing operations. On top of this, IFC has been successful in rolling over its funds by selling participations in its investments. This helps to account for the fact that IFC's total commitments are in excess of its subscribed capital. Although it had made net commitments of \$111.5 million as of September 30, 1964, the Corporation still had over \$51 million available for investment -- representing \$19.5 million in accumulated net earnings and \$31.8 million from sales of investments and other sources in addition to its subscribed capital of \$99 million.

The amendment to IFC's charter in 1961 has also widened the range of its financing activities in other ways. In the first place, it has made it possible for the Corporation to take part in underwriting new share offerings and to make standby commitments. Its gross commitments in these respects total more than \$16.7 million, including major participations in two offerings of stock by a well-known Mexican steel company, Compania Fundidora de Fierro y Acero de Monterrey, S.A. IFC's role in the underwriting field is, in addition, intended to assist the development of local capital markets.

In the second place, the freedom to make equity investments has enabled IFC to assist in financing private development banks, many of which have been required to expand their equity base in order to increase their operations. The development banks, in turn, have been able to assist smaller or medium-sized companies whose requirements IFC itself cannot

hope to service satisfactorily. In all, the Corporation has provided more than \$17.1 million in capital to banks of this kind, often in conjunction with loans from the World Bank or credits from the Bank's affiliate, the International Development Association.

In several cases, IFC's decision to take part in financing industrial projects has proven to be of decisive significance in enabling companies to proceed with expansion and other plans. Since IFC funds are intended primarily to cover foreign exchange outlays, this financial assistance has been particularly valuable to companies in countries where there have been exchange shortages. But the provision of financing is not the only service performed by IFC. It is in a position to provide a package of services in helping to prepare a project, whether this involves starting a new industry in a country, helping to bring a new company into business or planning the expansion of an existing company. In many projects, IFC is required to act not only as an investment bank or underwriter but also as industrial promoter and management and engineering consultant.

In order to perform these functions, the Corporation is in a position to draw on its own operating staff, on the resources of the World Bank as well as on outside consultants. IFC's staff consists of financial analysts (investment officers), engineers and accounting and legal advisers. Operating as a working party on a specific project, IFC staff are in a position to make a full analysis, with the help of field trips to extend their acquaintance with project and sponsor alike. From this background, it is possible to answer some of the basic questions. Are the estimated capital costs realistic? Has sufficient provision been made for possible overruns or delays in startup? How experienced is management? Does it need the assistance of a technical partner to get into a new line of business?

How effective are the accounting procedures? These are only some of the questions to be considered. The staff appraisal, embodied in detailed financial and engineering reports, provides the basis for the decision whether or not to make a commitment. The end result may be recommendations for substantial changes by the working party, backed up by economic and marketing studies prepared within the Bank. By this stage, if a commitment appears likely, the outlines of an investment agreement between IFC and the sponsors of the project will have begun to firm up. All of this activity represents a considerable pre-operational investment.

This approach permits a high degree of objectivity in the appraisal of a project. The need is apparent, since in many cases capital costs for machinery and equipment may be heavy. While many industrial projects in developing countries are financed by suppliers' credits -- with the purchase tied to the prices offered in a particular country by a particular supplier -- it is not the policy of IFC to tie investment commitments to the procurement of specific equipment. Nor is there any requirement that the proceeds of IFC financing be spent in a specific country.

The same degree of objectivity is likely to be necessary in choosing a technical partner. A new industrial enterprise in a developing country may need to draw on a foreign company to obtain its technology and it may also require considerable management assistance in seeing a project through its teething stages. As a matter of operating policy, IFC has encouraged partnership arrangements. It has helped finance projects in which Japanese interests have teamed up with local entrepreneurs in the textile industry in Africa. It has made commitments, too, for projects initiated in India by local businessmen in partnership with French and German companies. The fact of partnership itself is important, but the terms on which partnerships

are arranged may still have a vital bearing on the success or failure of an enterprise. Generally speaking, IFC has argued that partnership is likely to be more fruitful if it involves a financial interest, as an indication of willingness to share in the risks as well as the profits of a business.

No two IFC projects are identical but examples of the Corporation's commitments in the petrochemical field show some of the opportunities -- and some problems -- likely to be encountered in promoting new enterprises in developing countries. IFC's first investment in the petrochemical field was in a Peruvian company, Fertilizantes Sintéticos S.A. (FERTISA) in 1959. The company was founded to produce synthetic ammonia from a petroleum feedstock and to convert it into ammonium nitrate and ammonium sulfate. FERTISA was originally organized in 1947 by a group of Peruvian stockholders who in 1955 brought one of the world's largest chemical companies, Montecatini of Italy, into the project as a technical and financial partner. Construction of a plant with capacity of 60 metric tons of ammonia per day was begun near Callao, with long-term debt financing of roughly \$4.5 million being provided by two European banking institutions. The plant was still under construction in June 1959 when the project was brought to the attention of IFC. Because of higher than estimated costs and a delay in startup, the company found itself short of working capital. IFC arranged nearly \$3.9 million in new financing for the company, including a commitment of \$1.4 million.

Partly as a result of continued production problems, partly due to competition from imports, the company continued to experience problems and was obliged to default on its interest payments to IFC and its financial partners late in 1961. At this stage, IFC was instrumental in arranging a reorganization of the company by readjustment of a large part of its

long-term debt, funding of some of its interest payments and short-term obligations and the provision of new capital. In addition, on the advice of a private consultant engaged by IFC, it was proposed that the capacity of the plant should be increased to 75 metric tons of ammonia per day in order to improve the company's earning capacity. These measures were instrumental in restoring the company -- in which the total capital investment now amounts to \$12.8 million -- to a more healthy financial condition. With production now being maintained at a high level, it is in a stronger position to meet its obligations and can even consider the possibility of increasing its capacity once again.

IFC's role in financing a major Argentinian company -- representing perhaps the largest single investment in the petrochemical field in Latin America -- was of a different nature. For a number of years, a group of major U.S. companies -- Continental Oil Co., Cities Service Co., United States Rubber Co., Fish International Corp. and Witco Chemical Co. Inc. -- explored the feasibility of establishing an integrated petrochemical industry in Argentina, using as raw materials natural gas, propane and butane being produced by the rapidly developing Argentinian petroleum industry. Plans for the project and proposals for financing were submitted to the Argentine Government and approved in January 1961. Financing of the project was substantially complete when IFC was approached in mid-1961 to participate in a debenture issue by the company, PASA, Petroquimica Argentina, S.A., being placed by two leading U.S. investment banking concerns. When it became clear that other likely sources of capital had been exhausted, IFC made a commitment to purchase \$3.5 million worth of debentures, thereby completing the financing and permitting a start to be made on the project. The case of PASA was unusual for IFC, in that its

participation occurred only after the financing plan had already been worked out by other investment houses. Nonetheless, without IFC's commitment, the start of construction on the project would almost certainly have been delayed.

In another case, IFC has for the past two years been assisting in preparing financing plans for a major chemical-fertilizer complex in a developing country, at the invitation of the government. The project, in its original form, was shaped by government policy to make the fullest possible use of domestic resources and maintain control in government hands. Early last year, IFC sent a technical mission to the country to make an on-the-spot survey of the project. While the mission had no doubts about feasibility, it questioned the size of investment contemplated in relation to the projected output of finished products. It felt that the low rate of return likely on capital invested and the lack of technical research and market analysis were major drawbacks as well. Subsequently, revisions made by the sponsoring government agency, acting with U.S. consultants, have led to a substantial reduction in capital costs. New estimates of the profitability of the operation have been made, based on more realistic selling prices in world markets.

Although IFC has greatly enlarged the scope of its activities in recent years, and has devised techniques of mobilizing large blocks of capital for major investment projects, the fact remains that its resources are strictly limited. In view of the steady growth of the Corporation's commitments, there has been some reason to believe that additional funds would be required in the not too distant future. The importance of IFC as a unique international agency equipped to assist industrial ventures in developing countries has been acknowledged in the World Bank proposal to make extra resources available to its affiliate. Under the terms of the proposal,

brought before the Boards of Governors of the Bank and IFC at the annual meeting in Tokyo in September 1964, the Articles of Agreement of the two institutions would be amended to permit the Bank to lend funds to IFC for re-lending to private industry without government guarantee. This would substantially increase IFC's available resources, with a limit on Bank lending of four times IFC's subscribed capital or surplus, or approximately \$400 million.

The provision of resources on this scale would open up new possibilities of investment for IFC. There are many large-scale projects -- in fields such as extractive industry (mining and smelting) as well as steel, petrochemicals and the like -- where substantial blocks of long-term debt capital are required in addition to equity funds. With loan capital available from the Bank, IFC would be in a position to make bigger individual commitments in the form of straight loans or a combination of loan and equity. It would also be in a position to free funds of its own tied up at present in loans and make them available for equity investment. The proposal to expand IFC's resources is still in an early stage and has only recently been submitted to the Board of Governors of IFC and member countries of the World Bank for their approval.

PROBLEMS OF FINANCING MODERN SMALL INDUSTRY

IN THE LESS DEVELOPED COUNTRIES

by J. Chanmugam, Senior Engineer
International Finance Corporation
Washington, D.C.

Paper presented at the Second Joint Meeting
of American Institute of Chemical Engineers and
Instituto Mexicano de Ingenieros Quimicas at
Mexico City, September 24 - 27, 1967

Since it is irrefutable that nearly all countries which have achieved economic and therefore political strength also have achieved relatively rapid growth in intensive, large scale industrialization, it is always interesting that demands never cease for governments and lending organizations to do more for the small entrepreneur in the less developed countries. Indeed, the complaint is common throughout the world that poor access to finance is the major roadblock to the development and prosperity of small manufacturing enterprises. But while the financing problem is seen at all levels of national development, including that of the United States, it is even more acute in the less developed countries where additional economic and cultural hurdles tend to distract potential lenders and investors from even attempting to serve the needs of the small industry sector. Unfortunately, the World Bank Group is no exception to this uniform inability to devise suitable financial arrangements for the small industry sector that would remain, if not profitable, then at least independently solvent. Many problems confront small sized industries in the less developed countries but few are as difficult to solve as those of financing. To the difficulties arising from limited capital and institutional resources which affect all industries in these countries, are added various obstacles due to the very smallness of size.

By confining this paper to a discussion of "modern" small factories, it will by definition eliminate native handicraft or cottage industries, organized in family type units characterized by a lack of a true employer-employee relationship, irregular hours of work, and rather primitive methods of production. The World Bank Group understandably has no useful role to play in these areas.

At their present stage of development, many of the less developed countries find themselves in a dilemma. Having achieved political independence, they naturally want to strengthen these gains with economic freedom. Unfortunately, they lack enough of the necessary resources to quickly achieve their goal of industrialization. These leaders understandably want to help their nationals break into industry, most of which is presently controlled either directly or indirectly by foreigners, as well as to widen the industrial base of their country. Hence their frequently stated desire for help in financing smaller (than optimum) sized industrial plants doomed to

serve less than economically viable markets. The size of the market is generally a decisive factor in the choice and success of any industrial undertaking. The World Bank Group therefore supports greater sub-regional economic cooperation that would enlarge the scope of markets and, as a result, make economically feasible the construction of optimum sized plants.

Inasmuch as the methods of industrializing the less developed countries have to be adjusted to the conditions actually existing in particular countries or regions -- within the framework of economic viability -- no single index of factory size or capital requirements or volume of output or number of employees or any combination of such criteria will satisfy everyone, especially those pressing for the establishment of a small industry sector in their countries. In practice, there is little need for a commonly agreed definition since the choice or combination of criteria would vary with the end pursued. It is, however, recognized that a number of industrial undertakings are adaptable to small factory scale operations on a viable basis but in certain other fields, small scale operation may be uneconomic and inefficient; iron and steel, auto assembly, fertilizer, petrochemicals, cement and heavy machinery, to name a few, cannot be feasibly undertaken except on a large scale. Size depends on many factors -- market, raw materials, timing, compatibility with other industries etc. Thus, the alternatives come down to (a) choice between a number of small factories and one or few large viable undertakings to serve a given environment (b) the choice as to whether a small factory should be set up or whether the venture should be postponed till the environment can warrant a more viable sized enterprise.

While the World Bank Group takes the position that there is no reasonable or justifiable alternative to its practice of preferring larger scale enterprises where they will do a better job than would smaller plants in the particular situation, there is room for maneuver in a category of small modern factories that can make economic sense. This type of factory unit is small relative to larger enterprises but, despite this, may be commercially viable with respect to its market, manufacturing flexibility and operational setup. Among such modern smaller factories, self-sufficient in varying degrees, can be found manufacturers of scientific instruments, custom furniture, sporting goods, some food and beverages, special types of paper converters, and other enterprises ancillary to conventional medium and large scale industry - the list is far from complete.

A variety of financing is available from the World Bank Group to assist industry in the less developed of its member countries.

World Bank loans and International Development Association (IDA) credits are made for the same purposes -- for development projects of high priority. The World Bank itself lends on conventional terms -- that is, at rates related to the cost of capital at which it borrows from the world capital markets.

IDA, on the other hand, makes its loans to countries not fully able to bear debt contracted on conventional terms; it grants credit at no interest for a period of 50 years, although it makes a small service charge to cover expenses. Both World Bank and IDA loans require government guarantee.

The International Finance Corporation (IFC) which has the responsibility for assessing all proposals pertaining to industry in the World Bank Group, supplements the activities of the World Bank and IDA by providing risk capital in the form of loan and equity to productive enterprises in association with private investors and management. It neither seeks nor accepts government guarantees in its operations. IFC negotiates its investments on terms designed to attract participation by private investors. It, too, seeks projects of high economic priority, always a crucial factor in deciding where World Bank Group funds will go. IFC is a minority investor looking to and mobilizing other investors for the majority of funds for a project, giving considerable weight in measuring its success to the amount of private funds it can attract into a venture and to the amount of its own investments it can turn over to private investors.

In addition to making direct investments in productive enterprises in the private sector, IFC also provides financial assistance to suitable local shareholder owned development finance companies, mainly in the form of share capital. The World Bank's assistance to finance companies takes the form of long term loans. The principal activities of the development finance companies supported by the World Bank group include the provision of medium and long term risk capital to local private enterprises. They act as a channel for both domestic and foreign private capital, underwrite issues of securities by local privately owned companies, identify new opportunities for investment and assist in the promotion of new companies. The justification for a development finance company rests on a number of criteria, including its ability to fill gaps existing in the capital market of that developing country, its economic viability in terms of the potential volume of business open to it, and its capacity to operate on a sufficiently profitable basis that would attract private investors.

As already indicated, the nature and scale of the operations of the World Bank Group do not justify its participation directly in individual small scale industrial projects. It has followed the practice of referring requests from entrepreneurs for financing below its operational limits to local development finance companies. Over the years, the IFC, on behalf of the World Bank Group, has developed close working relationships with the development finance companies. It has frequently provided a wide range of technical assistance, helping to draft statutes and prepare policy statements, finding experienced management, training staff and developing procedures for effective project analysis. In nearly every instance, an analysis of the prospects for business has indicated that involvement in small scale manufacturing ventures entails high risk financing and requiring for example, relatively large amounts of equity contribution. Because this vitiates the shareholder oriented objectives of the development finance companies with which the World Bank Group is associated, they have tended to refrain from participation in the small industry sector. In two instances, however, in Malaysia partly encouraged by an interest free long term government loan and in the Ivory Coast influenced by the possibility

of a government guarantee fund, the development finance companies in addition to their normal operations are experimenting with the provision of supervised credit to small scale entrepreneurs. In the latter case the program started only a few months ago. In the former it is still too early to generalize from the results achieved; the evidence seems to indicate that the small loan program to serve the small ventures has accounted for a much smaller share of the business than was expected. It is however, significant that both of them within a short time of embarking on the program recommended the setting up of special institutions to provide technical and management assistance to the small scale manufacturer with the implication that the finance companies find themselves hard pressed to cope with the problems of the small industry sector.

The case has often been made that the industrial estate representing a planned clustering of small manufacturing enterprises offering more or less standard factory buildings erected in advance of demand, and a variety of common utilities, services, facilities and technical assistance to the occupants, could be a prudent means of promoting small scale ventures. In one highly experimental effort, the World Bank Group is keeping close tabs on records of two industrial estates in West Pakistan partly financed by an IDA loan. In this particular case, suitable applicants are drawn to the Pakistani estates by a cash allocation device geared to serve small scale entrepreneurs who wished hard currency financing in exchange for their own rupee holdings. None of these applications for cash required financial appraisal since the applicants arranged matters through their own commercial bankers. As it turned out, the cash allocation scheme enabled the estates to skim the cream of talented and resourceful entrepreneurs - those who had some money to begin with and showed a history of successful business dealings. Unsophisticated applicants with little or no money of their own are, in fact, being excluded from the estates. After receiving training from a foreign consulting firm, government agencies are in the process of being set up to handle the job of appraising the economic viability of applications to the estates and to provide technical and managerial advice. Handling the disbursement of funds is a government controlled commercial bank; it is planned that a consortium of commercial banks would assume the function of financial screening of applicants with the government assuming 50 per cent of the risk.

The World Bank Group has begun to study the economic impact of the two Pakistan industrial estates. We know they have provided a certain amount of employment and facilitated a certain amount of production. But we also want to know whether the purpose and objectives the estates are to achieve could also be reached without them. The results of the Pakistani experiment have yet to be quantified.

Although the World Bank Group's direct involvement in the small scale industry sector has been very limited, it has by necessity over the course of years through its manifold activities, particularly in the industrial and capital market fields in the developing countries, been able to rather closely observe this sector in the context of economic development and growth. As a result the World Bank Group does have some fairly definite ideas on what its practice should be toward the smaller manufacturer who sees the necessity of using modern production and managerial techniques. It is therefore necessary that this particular category of entrepreneur be further defined and an attempt made to fix its role in the hierarchy of economic development.

Although considering them modern insofar as manufacturing techniques are concerned, the World Bank Group rejects on principle financing those manufacturing enterprises of less than optimum size for that particular market environment and whose deficiency of economy of scale brings into question their economic viability. Proposals to finance smaller manufacturing enterprises in the developing countries whose creation is motivated less by good economics and common sense than by internal pressures are considered to be an inefficient use of scarce resources on the part of the World Bank Group and the country involved. It must be remembered that there are important differences in the nature of the problem of financing small industry as between the more developed and less developed countries. In countries with well established and developed industrial and financial structure, the problems are largely marginal from the point of view of the economy as a whole. In the less developed countries, the problems of creating industrial enterprises are not only fundamental but also unique.

Having entered its third decade of operations in the field of international development, the World Bank Group's experience has been that the chief obstacle to a higher rate of investment in the industry of the developing countries is a shortage of soundly conceived and adequately prepared projects. In the words of Mr. George D. Woods, president of the World Bank and its affiliates, to the UN Economic and Social Council in March 1965: "Neither general programs nor even generous supplies of capital will accomplish much until the right technology, competent management and manpower are brought together and focused effectively on well-conceived projects. Projects are not only focal points, they are growing points, not only for the goods and services they contribute to the economy but for the new skills and the new attitudes which they engender both among the people carrying them out and those who benefit from their effects." Mr. Woods' remarks apply most particularly to small scale industry whose problems are recognized by all concerned to exceed by far those of large initiatives. To go a step beyond his remarks, it would appear that capital shortage is not a uniform problem of local industry; rather the problem may also be one of capital vainly seeking viable projects.

Determining the role played by small industry is a difficult assignment for development lenders who first seek to quantify the viability, before committing themselves, of a socially or politically desirable project. In spite of a great deal of effort, far too little is known about the quantitative appropriateness of small scale industry to economic development. Statistics are deficient and there is very little precision and much confusion about the real part the small scale sector has played and can and should play. We recognize the remarkable relative performance of smaller industry over the years in terms of number and providing employment vis-a-vis medium and large scale industry. But we have only very unreliable statistics for the past with respect to the output of such establishments, its actual contribution to the economy and the extent to which the resources expended on them have been efficiently utilized. We suspect, too, that the rate of turnover of small establishments must be substantial but we don't know exactly how fast and how much this has cost the economy.

In some developing countries where there are few large industrial plants, the small entrepreneurial class has little opportunity to benefit from an association with bigger companies which could be expected to provide subcontracting work, managerial stimulation and technical know-how. In this respect the information available indicates that the Indian subcontinent finds itself in a more favored position than for example, central Africa and similarly Latin America in relation to Central America. In less sophisticated areas, the purely social value of a small industry sector can be considerable. From the educational point of view, it is often argued by the planners that the development of small factories can serve as a training ground for the skilled labor and managers needed later by more complex industrial efforts. From the point of view of employment opportunities, the case is put forward that small industries can absorb the surplus labor and resources springing from the agricultural sector which has increasing tendency to become more efficient as a result of more intensive crop practices. However, recognizing the social and educational values of small industrial development is not to deny the requisite importance of building the small factory sector on an economically workable base and this is particularly relevant when scarce resources of capital are to be involved.

As it appears to us from the experiences in countries like India and Brazil where a comparison is possible, although some small factories may have the potential to grow into large ones, whole sectors of small industry are in fact losing ground or have already perished in competition for the corresponding product with the relatively larger, more sophisticated and better organized factory production. This essentially fortuitous process obviously entails a substantial waste or misuse of capital and other scarce resources. The World Bank Group feels, therefore, that any financing instrument designed to serve small industry should reasonably assure that primarily those enterprises are encouraged which are, or give promise of becoming economically, technically and financially sound, and have the potential to grow and manufacture those products that are unlikely to face competition from large scale enterprises. The appraisal of a small factory project would have to center around these questions. In other words, beyond simple credit-worthiness, the entrepreneur would have to present convincing evidence of his economic and commercial viability, his growth potential and his potential to survive and compete in the available market.

The risks associated with financing industry in the less developed countries are acknowledged to be substantially higher than in the industrialized countries. Leaving aside the issue of political and civil stability, our past experiences would seem to indicate that important factors are lack of trained entrepreneurship, absence of an industrial environment and of cost accounting procedures, inadequacy of economic and social overheads, reluctance on part of consumers to try new products, lack of proper marketing and distribution preparation, low labor productivity, poor repair and maintenance facilities - these factors make it difficult to predict the success of a new industrial undertaking and are particularly relevant to small enterprises.

On the reasonable assumption that small factories or units make economic sense in certain contexts and that such small scale projects have a role to play in a progressive economy, the question of suitable financial arrangements arises. The problems of financing are manifold but from the point of view of the investor, they crystallize into one major consideration - investment in small scale manufacture is less profitable and more risky than investment in larger companies.

Experience shows that associated with the inherent risks, the small production output of the small industry generally results in high unit costs and profits are too low to service loan capital on commercial term. Hence, such projects need a larger proportion of equity to debt than corresponding large projects. Unfortunately, it is precisely the small scale project which finds it difficult to attract the necessary quantity of equity financing. This is because the kind of person who promotes such a project usually does not have sufficient capital to risk as equity. His contribution tends to be the idea, the concept, the enthusiasm and in rare circumstances the resources needed to make it competitively workable. He also generally finds it difficult to get other partners to put up equity since in developing countries there are other less risky and more profitable avenues for the use of scarce capital. Past experience also indicates that in many instances there is a marked but not unnatural reluctance on the part of the sponsor of a small enterprise to bring in or associate himself with equity partners fearing loss of independence. These are perhaps the very reasons that make such an entrepreneur think in small scale terms and cling to small scale concepts.

Small firms necessarily borrow less than big ones resulting in a smaller absolute return to the lender. However, the cost of appraising a loan request does not, in general, fall proportionately with a decline in loan size. The common institutional sources of loan funds such as commercial banks tend to have little interest in the small borrower. If such loans are to be made, the banks would in normal course of business insist upon physical assets - plant, equipment, inventories, as collateral and/or guarantees from individuals whose financial worth is acceptable. In addition the small entrepreneur may not have the experience or is ignorant about providing of proper financial projections and records needed by lenders to process a business loan application, critical items which could be expected to facilitate the adoption of low cost methods of loan control.

This entire combination of factors causes the conventional institutional lenders to raise the interest rate for small industry loans. It should also be kept in mind that lenders tend to be concerned about even very small differences in profitability when their funds can be absorbed by the most profitable type of client -- invariably a larger enterprise. It is quickly learned that, aside from greater risk, the cost of making many small loans is greater than the cost of making one large loan. In practice, this means that credit when available from commercial sources to small scale entrepreneur tends to be significantly more expensive than the commercial cost of capital which in turn has its profound effect on the net cash flow and profits of a highly vulnerable business.

Many observers have noted that, on the whole, the quality of management is the decisive factor influencing the success or failure of the small enterprise and that in order to provide financial assistance that is effective one must go beyond the financing of machinery and equipment and take into account the necessity to make good the deficiencies in human resources. In fact, the old saying, "Capital follows management" has even more validity in the developing countries where the caliber of management tends to be generally lower and uneven. It is only logical that special stress should be laid on the capability of management inasmuch as the lack of managerial depth virtually eliminates any chance of remedying weakness at the top level. There is usually no possibility of changing the management of a small enterprise should the initial evaluation prove incorrect. Sometimes it is possible to improve management capabilities by advisory assistance but this depends on the lender being able to arrange such assistance and prior screening of applicants who show a willingness to learn and cooperate. These qualities do not necessarily go hand in hand with initial credit-worthiness, but they may be even more important for the longer term life of the enterprise. Shifting consumer tastes, changing technology, volatile prices, competition and availability of raw materials all can tax the ability of unsophisticated management.

Broadly speaking, this means that the small factory is forced to adapt to its business environment more than it can influence it. Consequently, the degree of flexibility built into the enterprise, in terms of its machinery, operations and management, is crucial to its future life. Small factories which are highly dependent on a specialized product, a narrow market, a particular location, and one or two managers for guidance, are highly vulnerable to a swift death. These are the firms which add to the statistics recording small industry's high turnover rate throughout the world. The fact that small factories are not always able to provide sufficient collateral to reassure the lender is another strike against it.

Evaluating the enterprise in the market for financing is essentially a matter of forecasting earning capability, capacity to make scheduled repayments, and its contribution to economic development. On its most complicated level this approach is called "project analysis" and can cost a good deal of money. In its simplest form and under the most favorable conditions, appraisal of the smaller enterprise can conceivably be distilled to little more than a review of past balance sheets and profit and loss statements. Where good accounts and comparative data are available, account analysis can tell a great deal about a company in a short time. But, unfortunately, accounts are often not available or inadequate. In any case, field checking is usually required to back up most account analysis and this adds to the cost of the screening. It is fairly obvious that the particular type of screening technique should be adapted to the sort of financing extended. In general, the smaller the loan and the shorter the term, the less elaborate screening is required, and the lower the cost of doing this work. On the other hand, the principal financial needs of an industrial enterprise are for long term venture capital.

In any event, the problems of achieving good financial results through proper appraisal and screening multiply when the goal is not simply repayment of the loan with interest or of the equity with capital gain but a quantitatively definable contribution to national development. Operating in this context, major lending agencies such as the World Bank Group do utilize appraisal and fund allocation criteria linked to the development goals of the country concerned. It is for this reason that smaller industrial enterprises, which are believed to contribute less to total economic development per dollar of investment input, find themselves less favored as loan recipients when in competition with large projects for the available scarce development resources. The World Bank Group obviously takes a much broader view of its task than more locally-oriented lenders. The location and perspective of the local lender has a bearing on his screening and lending strategy. As stated earlier, the World Bank Group, for example, would normally deal with the financing problems of smaller sized industrial enterprises through a development finance company in which it retains an interest.

As they are presently constituted, shareholder owned development finance companies do not appear to be satisfactory instruments to effectively serve the needs of the small industry sector. The costs involved in processing small loans on normal criteria have proven prohibitively expensive to the development finance companies' affiliated with the World Bank Group. From the experiences gained so far, these development finance companies find it unprofitable to process loans on commercially acceptable terms under a certain size and this, generally speaking, rules out their substantial participation in small industry financing. For this reason, most such development finance companies deliberately set minimum size limits on loans which they provide, particularly since they do not have sufficient room to manoeuvre in charging interest commensurate with the cost and risk of small business ventures. The situation is not different for organized commercial banks. We do not say all our development finance companies shy away from all requests for small factory financing at all times. Clearly, some appear to be better suited to handle small finance applications from small entrepreneurs than others and this depends on the country in question: the development finance company in the Ivory Coast invests in projects whose size would characteristically be considered as small scale by the development finance company in India and below its operational limit. What we are really concerned with are those industrial undertakings whose size is small relative to the optimum or normal size as characterized by the relationship between level of production operation and operating cost on one hand and the market potential for that product on the other hand, taken in the context of the conditions pertaining to that particular country or to the region's environment.

As a general rule then, our experience shows the critical problem with small scale industry to be this: In view of the risks involved and the high administrative and servicing cost of financing, the cost of money for investment in small businesses is more expensive than for larger ones. This means that prospects for profitable operation are less than for a corresponding operation which can secure funds at normal commercial

rates and the risk element is enhanced. The problems of securing appropriate financing thus becomes compounded. In fact, the above state of affairs may be pragmatically interpreted to provide a definition of small business as one that does not have access to national capital markets.

Small factory enterprises that cannot borrow or raise equity at the prevailing conventional rates, must by any reasonable judgment be outside the zone of acceptable industrial risks for commercial investment institutions. The issue that we are confronted with is whether there is justification for special arrangements to increase the availability and decrease the cost of venture capital for small businesses. Various arguments which have been proposed in both the developed and less developed countries in favor of such a course of action essentially centre around two propositions. The first is that the contribution made to national development goals by small industries is desirable in some special way that is above and beyond the production and sale of goods and services; in order to maximize this "special contribution", small industries must be assisted in some special way. The second is that the small manufacturer is prone to special sorts of difficulties in virtually all phases of his operations - financing, management, production and merchandising; consequently special help ought to be given him so that he may cope with these "special difficulties".

The justification for special assistance to small factory enterprises must therefore be gauged in terms of "special contributions" and "special difficulties", attributes that are perhaps the most meaningful way of describing small industry. We have already mentioned the paucity of reliable information even in the developed countries regarding the contribution of small industries to the national economy. Much reference continues to be made to the social and educational benefits, the development of competitive attitudes and individual freedoms, and so on, motives that are of particular political significance in the less developed countries. We in the World Bank Group do not believe there is at the present time any manageable way to evaluate the "special contribution" of small industries, either in an absolute or relative sense. In this connection, it is interesting to note that even in the socialist countries with centrally planned economies, the relative contribution of small sized industries to the total industrial output is substantially smaller than the corresponding relative industrial output in the Western European countries, U.S. and Japan.

The justification for special assistance thus hinges on an evaluation of "special difficulties" and how important are the unique handicaps faced by small productive enterprises. For this purpose, special difficulties must be assessed in terms of cost. As mentioned earlier, the most important element of cost is the risk element associated with the caliber of entrepreneurship and the vulnerability of small industry to external influences. The question before us is that if the risk element in small manufacturing enterprises is relatively high and if this is an inherent characteristic of such businesses, what reasons are there to expect that the cost of the risk element should not be commensurate and compatible with the risk involved. In addition, there is the service cost element -

administration, screening, etc., which is clearly higher for small sums of money than for large because of the obvious diseconomies of scale. It is surely unreasonable to expect private investors and commercial institutions such as shareholder owned banks and development finance companies to absorb these costs.

On the other hand, if the small manufacturer is willing to pay the price for the equity financing and long term loan he needs, what is it that prevents him from securing such funds. The answer would appear to be that such high risk funds are not generally available even in the developed countries from commercial sources operating within the confines of the prevailing capital market. A small manufacturer, therefore, has no recourse but to accept the terms set by individual discretionary action. In the developing countries the private investors are an even more elusive breed and their objectives are even more out of step with the long term goals of the small factory owner. It is not surprising, therefore, that this sort of reasoning leads many planners to conclude that there is an institutional gap to provide high risk venture capital for the small manufacturing operation.

Before small industry financing measures can be implemented anywhere, the economic infrastructure which applies to the industrial sector must first be established in order to avoid these measures from becoming self-defeating. The necessity for the State to define the various rights, obligations and incentives which are applicable to the small as opposed to the more conventional larger scale entrepreneur is obvious. Many institutional devices are being tried and discarded in various countries to cope with the problem of drawing funds into the small industry sector. Guarantee schemes of one sort or another and various forms of subsidy are being used to encourage the regular banking and development financing system to do a better job of meeting the investment needs of small manufacturers. In many countries specialized financial institutions of a public nature have been setup to supply venture capital. Others have tried cooperative associations and societies for obtaining credit on reasonable terms. Various schemes have been, and are being, evolved to provide technical advisory services - market research, management, costing, accounting, productivity, etc. to improve the overall efficiency of the small producers and to minimize the risk of failure.

In the end, all the concepts and ideas for providing special measures to cope with the "special difficulties" of small scale manufacturing boil down to the question of who is going to bear the cost of screening, servicing and risk of a number of small equity and loan investments. No ordinary commercial institution which has to meet its responsibility to its shareholders can carry this burden. If it is indeed appropriate to compensate small manufacturers because of apparent inadequacies in the prevailing capital market, then there would seem to be no option but for the State to assume the direct or indirect responsibility to provide this compensation. This has in fact been the practice in the developed countries and one can see no reason why it should be different in the developing countries.

The experiences gained in a variety of countries indicate that any such measures taken in isolation to compensate for the "special difficulties" of small enterprises are rarely worth the effort and the measures have made headway only when integrated into the whole problem of the development of capital markets and industrialization. The magnitude of the efforts to help small factories in this context is not insignificant and substantial deployment of capital and more importantly of manpower talent, are involved. Countries that can afford to spare these national resources also happen to be those that have achieved a relatively high level of industrialization and capital market sophistication and where the small factories tend to be ancillary and service types rather than prime producers. In the developing countries where such capital and manpower resources are scarce, there is a real problem as to whether the country can afford to divert them to deal with the special problems of the small producers when development is so lagging in the field of conventional industry and capital formation. For example, many of the shareholder owned development finance companies in the developing countries with which the World Bank Group is associated, have tended to refrain from participating in government sponsored small industry financing schemes involving typical guarantee and subsidy safeguards because they find it difficult to even obtain their normal requirements of capable staff. Some knowledgeable observers have gone so far as to suggest that if the various efforts to foster small industry are channeled to properly develop the normal capital market and conventional industry sector, the quicker the creation of the base environment which allows the small entrepreneur to find his place in, and make his "special contribution" to the social and economic life of the country and the less the need to waste scarce resources in achieving this end.

Certainly the institutional techniques and measures being applied to small industry financing are in a constant state of reevaluation and reorganization. Nowhere have fully satisfactory answers matched the questions seriously disturbing the small industry sector. This may be so because the financial problems of small manufacturers are hardly ever just financial. No purely financial solution will really help when so much of small industry is bogged down in inadequate management skills, poor planning, bad marketing, outmoded product design, lack of cost accounting, the inherent need for subsidies and preferential treatment and other problems the solution of which the larger scale enterprises take for granted. From this point of view, it is difficult to see how governments can avoid assuming the dominant role, the cost and the risk in small industry financing in the less developed countries.

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THE FERTILIZER INDUSTRY

FERTILIZERS: A BASIC PRIMER

J. Chanmugam

[Some basic information is necessary to enable the non-technical reader to understand the terms used in discussions of the fertilizer industry. This article includes a description of the most important fertilizers, their physical properties, the processing methods used, and costs.]

The primary function of fertilizers is to provide necessary plant nutrients for growing crops. High natural soil fertility is a rather rare phenomenon anywhere in the world, and few soils can be cropped economically for more than a few decades continuously without requiring supplementation with essential plant nutrients. In any permanent agricultural activity, the maintenance, let alone improvement, of soil fertility can only be accomplished by returning to the soil at least those quantities of plant nutrients which have been removed by cropping, leaching, and erosion. The appropriate use of fertilizer—along with other inputs—is obviously essential to achieve the high yields required by current population increases.

The advantages derived from fertilizer applications are similar throughout the world; only the degree of benefit changes from area to area, depending on such factors as soil conditions, climate, educational level of the farmer, farm management practices, etc. From the point of view of the farmer, however, the use of fertilizer is only valuable if it produces a profit—that is, if the value of

Dr. Chanmugam was formerly Senior Engineer and is now Deputy Director of Investments for Latin America, Europe and Australasia, International Finance Corporation, Washington, D. C.

increased crop yield is greater than the cost of the fertilizer (including application) plus the cost of harvesting and storing the additional crop. In general, the greater the profit obtained by fertilizer application, the more fertilizer will be used per unit of cropland. Thus, average applications on valuable fruit, vegetable, and tobacco crops are often two or three times those on field crops.

Plant Nutrients: Demand and Supply

Some fifteen elements are known to be essential to plants. The three most often seriously lacking are nitrogen (commonly designated by the letter N), phosphorous (P_2O_5), and potassium (K_2O). Singly or in combinations, these three are the major components of chemical fertilizers.

• *Estimated fertilizer productive capacities, 1965*¹

[Thousand metric tons]

Area	N	P_2O_5	K_2O	Total
Asian Subcontinent.....	1,299	421	240	1,960
(India).....	(534)	(245)	(-)	(779)
Africa.....	347	669	1,016
Latin America.....	1,063	437	21	1,521
(Brazil).....	(31)	(74)	(-)	(105)
Total.....	2,709	1,527	261	4,497

¹ Includes only fertilizer production units that were known to be operating as of July 1, 1965, according to McCune et al. (2)

Nitrogen is agronomically much the most important of the three for many complex reasons, the purely technical aspects of which need not be discussed here. Nitrogen is deficient in most soils and does not tend to accumulate from applications. When it is not present in sufficient quantities, crops often do not reach their normal size, weight, color, water content, and succulence. Maintaining an adequate supply in the soil is one of the most troublesome problems in agriculture. Recent studies have shown that, even though more nitrogenous fertilizer is being used than ever before, twice as much nitrogen is actually being removed by crops as is being added to soils. The amount of nitrogen required by the soil varies from region to region and crop to crop, but in all cases increases in yields and resultant economic gains are great.

Phosphorous tends to hasten maturity of plants, influences proper cell division, develops good root systems, causes formation of fat and albumin, and generally gives strength to the plant. Its benefits are minimized, however, unless the nitrogen content of the soil is first raised to required levels.

Potassium influences the development of the woody parts of stems and pulp of fruits. It affects the plant's natural oxidizing and

reducing processes, protein synthesis, and development of chlorophyll. Adequate potassic content enables plants to resist a variety of diseases, as well as ill effects due to over-application of other nutrients.

The chemical fertilizer industry to supply these nutrients is growing rapidly, both in terms of exports from industrialized nations and in terms of manufacture in the developing world. It has been estimated that the developing countries alone must increase their use of chemical fertilizers from 6 million metric tons in 1966 to 40 million by 1985 merely to keep agricultural production abreast of population growth. Production of this magnitude will not be easy to achieve, since the fertilizer industry is highly capital intensive and requires much skilled manpower.

The Science Advisory Committee of the United States [see The World Food Problem, Vol. II, p. 382] estimates that a capital investment of \$500 per metric ton of plant nutrient capacity is necessary for mining or manufacturing and distribution of fertilizer in the developing nations. This \$500 includes warehousing, railroad cars or equivalent, vehicles, distribution outlets, and working capital, as well as actual mines and plants, but it makes no allowance for any infrastructure—e. g., port facilities, roads, or railroads—which might be required.

Fertilizer needed to increase agricultural production on acreage now under cultivation in Asia,¹ Africa, and Latin America by the percentages indicated

Percent increase in agricultural production	Tonnage of plant nutrients needed (millions of metric tons)	Percent increase in fertilizer use	Capital needed	Total annual cost
			(Millions of United States dollars)	
-----	² 6	-----	-----	1,300
10	11	80	2,500	2,400
20	16	165	5,000	3,500
30	21	257	7,500	4,600
40	26	345	10,000	5,700
50	32	440	13,000	7,000
60	38	535	16,000	8,400
70	46	645	20,000	10,100
80	53	765	23,500	11,600
90	60	885	27,000	13,200
100	67	1,000	30,500	14,700

¹ Except Mainland China and Japan.

² Actual consumption in 1966.

The Committee notes, however, that the impressive capital requirements will be much easier to obtain than the necessary manpower. About three skilled and five unskilled people are required for every thousand tons of plant nutrients produced and distributed

per year. Approximately half of the skilled personnel would need to be college graduates or equivalent, while the remainder would require on-the-job technical training after secondary school. This suggests that 50,000 college graduates would be needed by 1985 in the fertilizer and associated industries in the less developed world if the target of 40 million tons were to be reached.

Essentially, the fertilizer industry is engaged in converting plant nutrients from their elemental state to a form which can be taken in by the growing plant. The three major nutrients cannot be taken in directly; instead, plants require the nutrient in soluble form in an aqueous medium—one reason why adequate availability of water is supremely important.

Once manufactured, fertilizer is graded according to its percentage content of nitrogen, phosphate, and potash, in that order. For example, a 20-16-18 fertilizer contains 20% N, 16% P_2O_5 , and 18% K_2O . The remaining 46 percent is "filler" of inert material. It is important in this connection to differentiate between "mixed" fertilizers, where two or three mono-elemental fertilizers are mixed in a purely mechanical operation, and "complex fertilizers," which result from a chemical synthesis whereby the nutritional elements are "born" within the product. Complex fertilizers are considered definitely superior.

Recent agricultural practices have tended to favor the concentrated, high-analysis fertilizer grades—urea (45% N), ammonium nitrate (33% N), and high-grade complex fertilizers (14-14-14, 20-20-0, 12-24-12, 10-20-20, etc.). These have distinctly lower transportation, handling, storage, and application costs per unit of fertilizer element. As a result, despite a sometimes higher manufacturing cost, they can be supplied to farmers at lower unit costs than the low-analysis products.

Nitrogenous Fertilizers

All nitrogenous fertilizer manufacture ultimately involves the capture of nitrogen from air (which is about 80% N) and its conversion into an assimilable and soluble form. The commonest forms of soluble nitrogenous compounds are ammonia and its derivatives (e. g., ammonium sulphate, ammonium nitrate, ammonium chloride), nitrates such as calcium nitrate or sodium nitrate, and urea. The proportion of nitrogen in any of these soluble compounds is what is finally important in a nitrogenous fertilizer. In addition, an increasingly high proportion of nitrogen is applied to the soil in complex or mixed fertilizers. The following are the most commonly used nitrogenous fertilizers:

Ammonium sulphate (20% N) was the most important nitrogenous fertilizer before World War II and is perhaps the most popular general-purpose fertilizer today. It is the principal form of nitrogen exported to underdeveloped countries, especially in Asia. Currently, however, other nitrogenous fertilizers show a higher rate of growth, both in production and use. Most of the ammonium sulphate that is commercially traded today is obtained as a by-product from coal and coke ovens.

Ammonium nitrate (33% N) is an inorganic salt, very soluble in water. It is 100 percent available to the plant and has both the quick-acting characteristic of nitrate and the slower action of ammoniacal nitrogen. In general, soil acceptance patterns and agronomical average values are good for all crops. Ammonium nitrate gives consistently superior results in fertilizing low nutrient and dormant soils. It is especially suited to pastures, cotton, and corn.

A feature of the postwar growth of fertilizer nitrogen trade has been the increasing part played by ammonium nitrate alone or diluted with powdered limestone or lime* (usually to 21% N, about the same as ammonium sulphate). These materials together now account for nearly 25 percent of total fertilizer trade, largely as a result of the sharp rise in ammonium nitrate capacity in all the major producing countries, especially the United States.

Capital investment and production costs per unit of nitrogen are comparatively low for ammonium nitrate. The manufacturing process involved is to first oxidize ammonia with air in the presence of a catalyst to nitric acid. The nitric acid is then neutralized with additional ammonia to yield ammonium nitrate. No additional raw materials are required. Because of its high N content, ammonium nitrate effects economies where transport over long distances is involved. It is generally manufactured as a coated pellet, which is easily stored and handled, showing both chemical stability and ease of mechanical handling. Extensive tests have proved that fertilizer-grade ammonium nitrate, as such, is not an explosive. A detonator such as dynamite is required to make properly prepared ammonium nitrate explode. Production of ammonium nitrate is particularly advantageous, in terms of cost, when combined with the production of complex fertilizers.

*Lime is used to control soil acidity, which must be kept down if fertilizer is to be effective. "An energetic program will be necessary to convince farmers to adopt good liming practices. To illustrate the magnitude of this problem, educational efforts in the United States conducted over a relatively long period of time have resulted in the use of only 50 percent of the total amount of lime actually needed." [The World Food Problem, Vol. II, p. 380.]

Urea (45% N), with the highest N concentration among solid nitrogenous fertilizers, has made the most recent major impact on international fertilizer trade. It now accounts for more than 25 percent of total export trade and is increasing its share faster than any other fertilizer material. Its suitability for agronomic conditions in Asia, high nitrogen content, and increasingly competitive price promote outlets for a rapidly expanding production capacity and promise to improve urea's position still further. The principal exporters of fertilizer-grade urea are Japan, Netherlands, Italy, the United States, and Canada. Many of the new plants throughout the developing world are also designed to produce urea.

Urea is readily soluble in water and completely available to plants. It lends itself readily to application directly as a solid or in irrigation waters. Generally, its nitrogen content is more slowly available than ammonium nitrate. It is an almost ideal fertilizer to be applied at planting, and has proved particularly suitable for tree crops, rice, and tobacco.

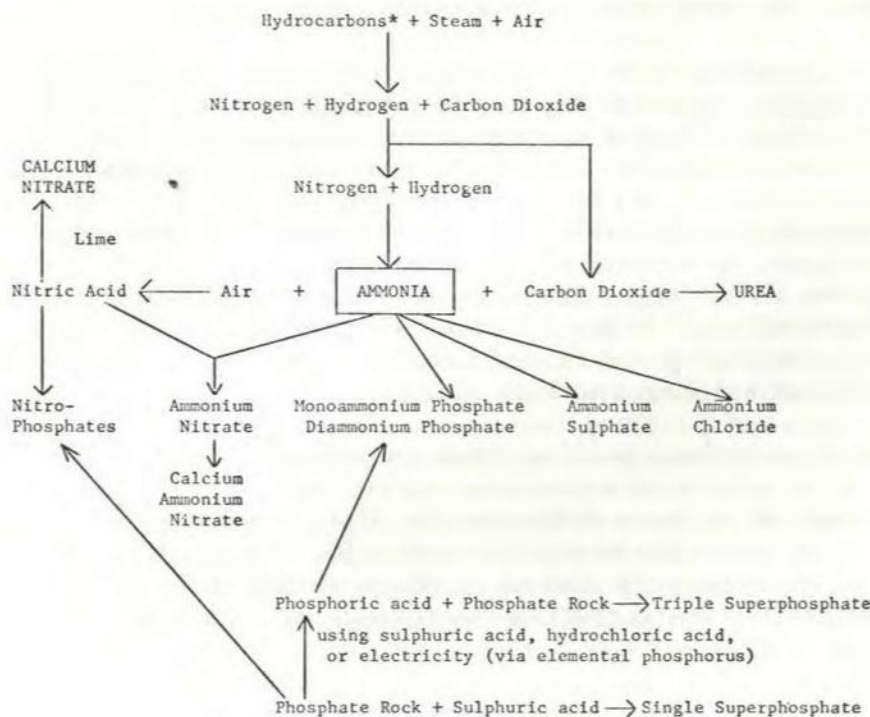
Urea is generally manufactured by passing a mixture of carbon dioxide (which is a by-product in the production of ammonia) and ammonia itself under high pressure to form ammonium carbamate. Urea is formed when the pressure is released. Because both raw materials for urea production are cheaply available from an ammonia plant, its production costs are lowest per unit of nitrogen of any major fertilizer. Its high nitrogen content results in cheapest transportation and storage costs, and when in a coated and pelleted form, it is easily handled and stored. It can be used in mixed and complex fertilizers and as a nitrogen supplement in cattle feed, as well as for direct fertilization. Eventually, an expanded urea output may be used for the manufacture of a whole range of chemical and plastic products. Although its world selling price is still high, urea is constantly gaining in importance; it probably has the greatest future potential of all the nitrogenous fertilizers.

Ammonium Phosphate. A very common form is the so-called 16-20 grade—essentially a mixture of phosphoric and sulphuric acids with ammonia. Consumption of ammonium phosphate has grown extensively during the past few years. This is primarily because it is an ideal $N-P_2O_5$ fertilizer, with a good agronomic value, 100 percent water soluble, good physical properties, and good mixing properties. One drawback at present is that its manufacture requires sulphur or, alternatively, sulphuric acid, since phosphoric acid must first be obtained from phosphate rock. Sulphur is in relatively short supply.

Nitrophosphate is the name given to a complex mixture of nitrates and phosphates made by neutralizing phosphate rock with nitric acid. It can be made over a wide range of compositions varying from 14%

to 33% N and 14% to 33% P_2O_5 . It is used fairly extensively in Europe, and most European exports to Asia of complex fertilizers consist of nitrophosphate with added potash. Unfortunately, not all the phosphorous in nitrophosphate is in an immediately soluble form; as a result, the modern trend is to use ammonium phosphate instead.

Product Interrelationships of Nitrogen and Phosphate Fertilizers



* Hydrocarbon feedstock can be natural gas, ethane, liquefied petroleum gases (LPG), or light naphtha for the reforming process. With heavier hydrocarbon feedstocks, partial oxidation processes would have to be used, which require higher capital costs than the reforming process.

Nitrogen in complex and mixed fertilizers. Most crops respond to a balanced plant nutrient application better than they do to any single fertilizing element alone. One-sided fertilization may, in fact, have eventual negative effects. In order to satisfy these needs, high-analysis fertilizers such as 14-14-14, 12-24-12, 20-10-10 formulations and the like have been developed. These permit balanced application of the three basic fertilizing elements, even for inexperienced farmers. Such fertilizer can be manufactured in the grade best suited to the particular crop for the particular location where it is grown.

Nitrogen in such formulations will not tend to decrease ammonium nitrate and urea applications, but will often be used in conjunction with direct applications of the straight nitrogenous forms.

Phosphatic Fertilizers

Phosphate rock, averaging 30% P_2O_5 is the principal natural source of phosphorous. It is found in commercially exploitable quantities in only a few places: U. S. , Morocco, Tunisia, Senegal, Jordan, U. S. S. R. , and the Oceania Islands.

The major constituent of raw phosphate rock is flourapatite, an insoluble variety of calcium phosphate which must be made soluble with a suitable acid. Single (18% P_2O_5) and triple (45% P_2O_5) superphosphates—most commonly obtained by treating the phosphatic rock with sulphuric acid—are by far the most important phosphatic fertilizers. Phosphoric acid, which is also obtained by a process involving sulphuric acid, is employed in the manufacture of complexes; it usually contains 30% P_2O_5 . Since sulphuric acid is so generally used, the availability of sulphur is an important factor in this branch of the fertilizer industry. Present prospects are for at least temporary shortages of sulphur and high prices.

Small-scale manufacture of soluble phosphates, though common in the past, is a relatively expensive operation. The tendency today is to build plants of at least 500 tons/day P_2O_5 -capacity, calling for approximately \$15 million capital investment. Production costs depend on the cost of the rock and of sulphur; in the U. S. at today's prices, production cost (including depreciation) is of the order of \$70 per ton of P_2O_5 .

Potash

Potassium chloride (muriate of potash) and potassium sulphate are the principal potassic fertilizer materials. They are commercially exploitable only in mineral form or by evaporation of certain brines, all of which are soluble. In most of Europe, U. S. S. R. , U. S. , and Canada, potash is obtained from underground mines. In Israel, and potentially in Jordan, its manufacture is based on the solar evaporation of Dead Sea brines. Ethiopia's deposits are beginning to come into production.

The facilities to exploit potash resources are necessarily large and expensive. Almost all of the new ventures and those under active consideration have a rated production capacity of a minimum of about 0.5 million tons of K_2O /year involving an investment of at least \$50 million in the productive facilities. Export prices average \$60-\$65 per metric ton, f. o. b.

Ammonia

As has been noted, an adequate and continuous supply of ammonia is essential to the manufacture of nitrogenous and complex fertilizers. Indeed, ammonia can be used directly as fertilizer, as is common in the United States.

Ammonia is the end result of the synthesis between hydrogen and nitrogen gases. Nitrogen is obtained from air. Thus, the production of ammonia is primarily influenced by the choice of hydrogen source. Hydrogen is obtained from hydrocarbons, the most important of which are the petroleum-based products, in particular naphtha and natural gas, but also including coal, coke oven gas, lignite, etc. The choice of raw material is obviously determined by availability and costs.

Both capital and production costs are lowest for gaseous sources of hydrogen; in fact, most modern ammonia synthesis units are based on natural gas. Natural gas is considerably cheaper than liquid feedstocks. Furthermore, as a result of the discovery of vast quantities of natural gas in the Sahara and, more recently, in the Netherlands, and the fact that nearly all the gases issuing from the wells in the Middle East are presently being flared (wasted), the tendency to ship liquefied natural gas in bulk is growing very rapidly.

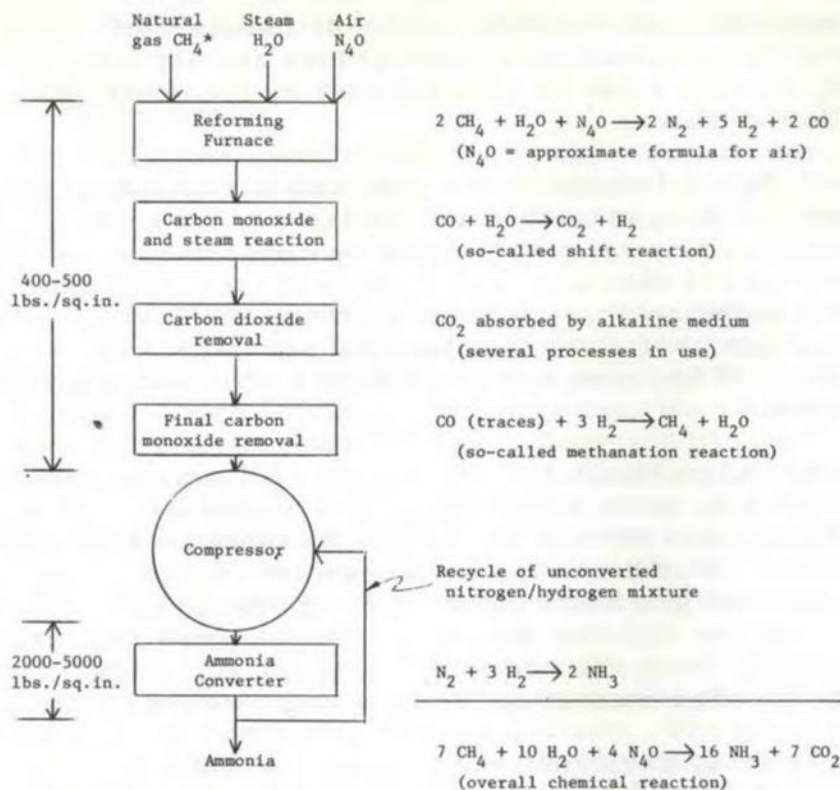
However, in many countries where gases are not available, the use of liquid petroleum feedstocks, especially naphtha, has to be considered, particularly if domestic petroleum resources are available. These feedstocks can only be obtained in the processing of crude oil. Their use is made more attractive for many countries because oil can easily be imported in bulk, especially in ocean carriers.

Both capital and production costs increase with the density of the hydrocarbon material. Solid hydrocarbons such as coal, lignite, or wood are by far the most expensive to use, although in some places their ready availability has made their use profitable.

Hydrogen can be obtained from any of these sources by one of two processing methods:

Steam reforming is the cheapest process available today. Here natural gas or naphtha, steam, and air are reacted together to yield hydrogen. As shown in the illustration, this hydrogen, together with the unreacted nitrogen from the air originally fed in, are then reacted to yield ammonia. The design of a steam reforming unit is specific to the hydrocarbon feedstock, and in this respect the process does not have much flexibility.

Process Flow Chart of Ammonia Synthesis



* Natural gas is usually largely methane, but may contain also ethane, propane, butane, higher hydrocarbons, carbon dioxide, nitrogen, hydrogen sulphide, and other gases. Ethane, liquefied petroleum gases (LPG), refinery off-gas, and light naphtha can also be used as feedstocks for the reforming process. With heavier hydrocarbons, partial oxidation processes would have to be used, which require higher capital costs than the reforming process.

Partial oxidation involves two units: 1) an air liquefaction plant where liquid air is formed and then separated into pure streams of oxygen and nitrogen, respectively, and 2) a combustion unit where the hydrocarbon and the pure oxygen stream from the air liquefaction plant are reacted together under controlled conditions. This hydrogen is then reacted with the nitrogen from the air liquefaction plant to yield ammonia. Capital costs are high. Production costs are also higher than for the steam reforming method. Very often a great deal of carbon soot is formed which requires removal. Nevertheless, partial oxidation has the advantage of a great deal of flexibility; in principle, any feedstock can be utilized, with only minor changes necessary in the operating conditions.

Costs. Since ammonia is the prime material in any nitrogenous fertilizer plant, considerable attention is usually given to the

production cost of ammonia in a project. This naturally depends a great deal on the cost of the hydrocarbon to be used. In addition, a choice of very great significance is the size of an ammonia plant. Ammonia plants having a capacity of 600 tons ammonia/day and larger are capable of adapting the newly developed centrifugal compressors and other technological improvements which result in substantial savings in production and capital costs. It is generally true that a plant of smaller capacity than 100 tons/day is not economical; 200 tons of ammonia is about the minimum size of plant that is economically practical.

The capital investment required for a 600 tons/day unit is of the order of \$15 million. If the natural gas costs 20¢ per 1,000 cubic feet (equivalent naphtha cost is about \$8/ton), the production cost, including depreciation but excluding capital charges, is approximately \$20/ton of ammonia. If the gas costs 5¢ per 1,000 cubic feet, the production cost is about \$15/ton.

Because of the importance of ammonia as the principal intermediate in the manufacture of nitrogenous fertilizer, the tendency in recent years has been to consider very large ammonia production facilities close to the hydrocarbon source—e. g., natural gas field—where ammonia could be produced relatively very cheaply. Ammonia can then be shipped out to the fertilizer consuming regions where plants to convert the ammonia into conventional fertilizers can be installed.

[Based on material presented at various courses of the World Bank's Economic Development Institute by Dr. Chanmugam. All charts and tables are from The World Food Problem, Washington, D. C., The White House, 1967, Vol. II, pp. 382-386 and Vol. III, p. 104.]

Filed in specs Box -

SEMINAR ON CONSULTANCY SERVICES IN

INDIA

Bombay - November 11 - 12 1972

Sponsored by ICICI



Speech Delivered by Dr. J. Chanmugam, World Bank, Washington D.C. at the Inaugural Session

Mr. Chairman, Ladies and Gentlemen:.

I am honoured to be here in this distinguished gathering to represent the World Bank Group which has had a long, happy, productive and rewarding association with India and its peoples. From a personal point of view, it is with humility that I stand before you in the country that is the source and sustenance of much of the culture and wisdom of the part of the World I come from.

It is appropriate to characterize one of the more important roles of consultants as that of providing scarce expertise services in our efforts to mate and integrate technological advances into our social needs. The levels of expertise are varied but in the end all of our objectives distill into the task of alleviating poverty and hunger in our concern for man and his well-being. The growth of the consultancy sector in India during recent years is one of the more remarkable developments and hence our interest in the better use of this valuable indigenous resource. The basic ethical problem for consultants is the quality of his services and contribution in our efforts to build a better world.

Like everyone else involved in this effort, the consultant and those who use their services have to distinguish between the accountability and accounting of their contribution. If we become blind to what goes on outside our little cells, we place at risk the future of whole enterprises and their working force, weakening our entire effort.

Somewhere along the line there has to be an audit and my choice of this expression is not without reason. We have in this gathering representatives of industrial companies and financial institutions in addition to the consulting profession.

The finances of a company, that is a measure of its success, are protected by the regular auditing of its accounts. Auditors of a company's accounts are appointed not by the directors but by the

shareholders at a general meeting. Auditors are responsible to the shareholders that financial accounts of the company are properly kept and auditors have the right to qualify their certification when they do not agree with the methods used. Their duty to the shareholders is also a duty to the public within the Company Registration Laws.

Similarly, Consultants and those who use their services - if we are to get optimum results - both have to reckon with accountability and accounting. The purpose of this seminar is to discuss the nature of this reckoning and the auditing entailed.

There are two entities involved in consulting - the first is the entity that requires consultancy services and the second is the entity undertaking to provide that service. It would be a tragic waste of resources to misuse and abuse the role of consultants which is after all a scarce resource and the tenor of the remarks of some of the speakers today points precisely to this issue. It would not be wrong to blame both entities: the one requiring the services for failing to be precise and clear in his own mind as to what he wants to be done and the one trying to provide the services for failing to find out precisely and clearly as to what he is called upon to perform. This is the reason when in dealing with Consultants, that we in the World Bank Group pay so much attention to preparing quite detailed terms of reference and definition of the issues involved. No conscientious investor or entrepreneur allows the thought processes leading up to an investment decision to be made by outsiders - he would, however, be prepared to consider recommendations and to assess the basis on which the recommendations were made by the consultants, to help him in his decision-making process.

On behalf of the World Bank Group, where we too are vitally concerned with assessment of the quality of the developmental effort and not simply with the quantum, I wish this unique meeting all the success it richly deserves.

Thank you.

(519) 679-2750
- 2666



The University of Western Ontario, London, Canada

Office of
International Education



10th July, 1975.

Dr. Rajan Chanmugam,
The World Bank,
1818, H. Street, N.W.
WASHINGTON, D.C. 20433,
U. S.A.

Dear Dr. Chanmugam,

This is further to our telephone conversation of last week regarding our Symposium on the New International Economic Order. We are indeed pleased that you will be able to attend - your experience in this whole area will be invaluable to its success.

The Symposium will endeavour to acquaint the senior members of the Canadian communications media with a more international perspective on the New International Economic Order. They will be invited participants representing major newspapers from coast to coast, and there will as well be representatives from radio and television. Our objective is two-fold : firstly, to educate the canadian media relative to a more international perspective on the New International Economic Order and secondly to ensure that our major communications media not only cover the 7th Special Session but have the background knowledge to provide a more positive viewpoint on major current issues.

The following persons have also agreed to participate :

1. MR. TARZIE VITTACHI, CHIEF,
U.N. FUND FOR POPULATION ACTIVITIES.
2. DR. ERSKINE CHILDERS, CHIEF,
U.N. DEVELOPMENT COMMUNICATIONS SUPPORT SYSTEMS.
3. H.E. MR. H. SHIRLEY AMERASINGHE,
PERMANENT REPRESENTATIVE FOR SRI LANKA TO THE U.N.
4. THE HON. MR. J. ALLAN McEACHEN,
SECRETARY OF STATE FOR EXTERNAL AFFAIRS,
OTTAWA.
5. THE HON. MR. P.J. PATTERSON,
MINISTER FOR INDUSTRY AND TOURISM,
JAMAICA.

.....2

DR. RAJAN CHANMUGAM,

We are endeavouring to keep this small enough in order that there might be a good in-depth discussion of the issues. I enclose an agenda of the proceedings.

The speakers on Thursday will be discussing the New International Economic Order from their several points of view, and we would leave it to you to present yours from whatever perspective you wish. Dr. Childers and Mr. Vittachi will, on the Friday, tie it in to the media.

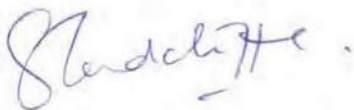
The Office of International Education, in conjunction with the School of Journalism and the Canadian International Development Agency is sponsoring the programme, and C.I.D.A. will pay all expenses incurred by you. A cheque for per diem expenses plus a small honorarium, if appropriate, will be available on your arrival and you will be contacted by a local representative of Air Canada in Washington regarding your flight arrangements.

We would appreciate receiving some biographical information on your career, as part of the advance background material to be distributed to participants.

We look forward to welcoming you to London.

Best Wishes,

Yours sincerely,



Shanthi Radcliffe (Mrs),
Assistant Executive Secretary.

SR/EDC.



J. Chamunfas
draft - Aug 5, 75

Self-Help Initiatives in the Alleviation of Poverty

The objectives of development include sustained increases in per capita output and incomes, expansion of productive employment and greater equity in the distribution of the benefits of growth. This implies reducing poverty and human misery by increasing the productivity of the poor and providing them with greater access to goods and services.

Past strategies in most developing countries have tended to emphasize economic growth without specifically considering the manner in which the benefits of growth are to be distributed. The assumption has been that increased growth per se would lead to a reduction in poverty as the benefits of an expanding economy spread among the people. Accordingly, the emphasis had been on increasing the rate of growth, with a corresponding concentration of effort on the "high growth," modern sectors of the economy--to the virtual exclusion of the traditional sectors. *But meanwhile, poverty has continued to exist without abatement.*

There is no uniquely correct way of measuring the extent of poverty. The World Bank has made an estimate of the extent and regional concentration of absolute poverty by adopting an arbitrary standard--that a person is in a state of absolute poverty when he has an annual income equivalent to \$50 or less. It has also made an estimate of the number of people whose per capita income is below one-third of the national average for the countries in which they live. Taking the two estimates together, approximately 750 million or 40% of the total population of developing countries can be considered to be living in absolute or relative poverty. ~~[Of this total, almost 70% are accounted for by the developing countries of Asia; 19% by Africa; and 13% by Latin America and the Caribbean.~~

~~These estimates are indicative of the geographic spread and magnitude of poverty. Furthermore, it was found that~~ ~~An estimated 600 million of the poor--or more than 80% of all the poor--live in the rural areas and they constitute~~ ~~40% of all the people in the rural areas. Nearly 550 million people living in /~~ ^{the rural}

areas have incomes that are the equivalent of \$50 or less. In summary, then, approximately 40% of the population of developing countries have neither been able to contribute significantly to national economic growth nor to share equitably in economic progress. In order to alleviate poverty, countries must therefore find the ways and means to increase the productivity of these people. And most of them live in the rural areas. It is for this reason that countries need to take measures to extend the benefits of development to the poorest among those who seek a livelihood in the rural areas.

Commitment by a country goes beyond recognition of the existence of the poor. It involves identification, planning and implementation of a strategy to reduce poverty on a broad national front. Any such strategy must recognize three fundamental issues. Firstly, the rate of transfer of people out of low productivity rural activities such as agriculture and related entrepreneurial efforts into more rewarding pursuits has been slow; and, given the relative size of the modern sector in most developing countries, it will remain slow. Secondly, the position of the mass of the people in the rural areas is likely to get worse if population expands at unprecedented rates while limitations continue to be imposed by available resources, technology, and institutions and organizations. Thirdly, rural areas have some resources, albeit small which, if mobilized, could reduce poverty and improve the quality of life. This implies better development of existing resources, the construction of basic infrastructure such as roads and irrigation works, the creation of institutions and organizations to cater to the needs of this rural populace

To reduce poverty, a country's efforts must be clearly designed to increase production and raise productivity. It must provide improved food supplies and nutrition, and improve the physical well-being and quality of life of the rural poor, so that they may enhance their ^{capabilities} productivity and their ability to contribute ~~to the national economy~~. It must provide the facilities

for the modernization and monetization of its rural society, with its transition from traditional isolation to integration with the national economy.

The objectives extend beyond any particular sector. They encompass improved productivity, increased employment, higher incomes, as well as minimum acceptable levels of food, shelter, education and health. A national program ^{therefore} involves a mix of activities, ~~[including projects to raise agricultural output, create new employment, improve health and education, expand communications and improve housing, and to encourage entrepreneurial and business activities.]~~

A strong commitment by the country to development policies at the national level is required if the impact on the problems of rural poverty is to be effective and broad-based. In some developing countries, prevailing practices and institutional structures are so far from encouraging to rural development that fundamental policy shifts may be necessary--for example as may occur in situations demanding extensive land reform or where action has to be taken on vested groups unsympathetic to the plight of those born poor. Some countries are only prepared to experiment at the specific project level. Some hold the view that such development activities are technically difficult or of low priority as it may lead to slower growth in output and exports. Whatever the reasons, unless countries commit themselves firmly to devising strategies and policies to raise the standards of living of the rural poor, the lot of millions of people will not improve significantly.

Development objectives to alleviate such poverty can be sought in various ways. The choice of methods, and the sequence in which they are used, should of course reflect social, cultural and political factors, as well as narrower technical considerations. While numerous individual projects and specific activities have been launched, a majority of countries still operate

without well articulated strategies, plans and programs for sustained and coherent development.

In some countries, prevailing national policies may be inconsistent with the efforts to alleviate poverty in rural areas. Here are some specific examples: Price policy may be inappropriate in that it tends to raise the cost of inputs relative to output prices, make innovation unrewarding and highly risky for the small farmer and the small processor of agricultural products. Some countries defend low prices for food on the ground that it is necessary to keep down the cost of living. In some cases, governments seek to compensate the farmer and processor of agricultural products through subsidies on inputs or credits. It may be more beneficial and less costly to provide incentives by guaranteeing minimum prices on agricultural products and processed products than to subsidize inputs; it may also be better to subsidize specific inputs in order to transfer specific technologies rather than to have general subsidies. These may be of particular relevance to the poor to properly match incentive with effort.

Fiscal policies may be such that they mitigate against the rural poor, who are either unrepresented or inadequately represented in the councils of government. For instance, in many developing countries, the distribution of public sector expenditure is heavily skewed in favor of cities. The situation may exist where a country is unable or unwilling to impose charges on those benefiting from publicly financed investment or current services--on the grounds that the recipients cannot afford to pay. Failure to impose adequate charges, in turn, severely limits the rate at which investments can be undertaken or services provided in the rural areas, even though the social and economic returns may be high.

Land reform has obvious implications and must precede any massive input of resources into small farms or rural works where the incidence of onerous tenancy is high, the distribution of land is extremely skewed, or oligarchy controls credit and marketing institutions.

When rural programs and projects incorporating a variety of developmental objectives and activities are contemplated, including not only private agricultural and industrial activity but also governmental infrastructure and social services, careful consideration should be given by the country to the locational aspects of the units of nonfarm activities. Problems obviously arise in determining the optimal areas and populations to be served by a local market center, an electricity transmission station, a water supply system, an industrial estate, a school, an extension office, a research station, a medical clinic, a feeder road, a bank or a credit institution.

A country must try to ensure that a constant flow of new, field-tested technical knowledge relevant to smallholder production is available for the continuing success of rural development programs. Many of the poor live in a harsh environment where new investments would produce little extra income until technological inputs create reliable new opportunities. Inappropriate research programs and the inadequacies of adaptive research and extension have in many cases been major factors limiting the benefits reaching poor farmers and the small processor of agricultural products.

A country should decide on basic questions such as the financial, technical and administrative efforts to be allocated to the program, the areas for major concentration, the phasing and sequencing of activities, the linkages among sector programs and the developmental impact aimed for. These questions can seldom be addressed effectively in a piecemeal fashion.

Community involvement in the selection, design, construction and implementation of rural development programs is often a first step in the acceptance of change leading to the adoption of new techniques of production. Rural people's perceptions of needs and possibilities may well be different from those of "rational" officials. The manner in which this is to be achieved, and balanced with the need for overall guidance and control from the center,

is a problem which can only be resolved within each country.]

The shortage of skilled staff to implement rural development programs is a major consideration. In some countries, particularly in Africa, the scarcity of skills is found at all levels. Incentives for those who intend working in rural areas are often intolerably low in relation to salary scales, allowances, the perceived status in the development hierarchy, promotion prospects and lack of amenities. The required changes in civil service practices to sufficiently respect and reward rural workers must necessarily be resolved by each country.

Training schemes must be relevant to the actual needs and priorities of particular local situations. [Consideration also should be given to the possibility of using community opinion leaders, such as primary school teachers, religious leaders and village cooperative secretaries as agents of change. The number of people who need to be trained is often so very large that countries may have to make more concerted efforts in training the trainers and adopt the multiplier approach.]

Countries should pay particular attention to the education programs to ensure the minimum learning needs for all members of rural society. Such "basic education" includes functional literacy and numeracy, and knowledge and skills required for earning a living, operating a household (including family health, child care, nutrition and sanitation) and civic participation. Thus defined, basic education is the minimum of education necessary for an acceptable rate of development, and for the wider distribution of its benefits. Effort needs to be directed by countries on schemes for providing nonformal and more cost-effective education and training to adults and adolescents.

Credit schemes show a number of common deficiencies and problems in lending and making credit accessible to small farmers and entrepreneurs in rural areas. [Large farmers and businessmen have tended to be the main beneficiaries of institutional credit. Moreover, the available supply of credit is often heavily

~~skewed in favor of short-term funds in the case of small farmers and small entrepreneurs.~~ For small borrowers, it is essential to provide a comprehensive package if the potential for increased productivity is to be translated into a commercial reality. There appears to be scope for using institutional credit to replace or augment credit from traditional sources in order to check monopoly situations which cause excessively high interest rates; to overcome inelasticities in the supply of credit which become apparent when new opportunities emerge; to ease the seasonal financial problems of rural households and businesses; and, most importantly, to encourage small farmers and small entrepreneurs to increase output and enter the commercial sector.

The efforts made by a country to promote rural industry and related entrepreneurial activities in the context of rural development merit special attention. In many instances, innate skills / ^{of craftsmanship} and manual dexterity in the rural areas are not being adequately exploited, while on the other hand, modernization of agriculture creates demands for new inputs and consumer goods which could often be produced locally. If these countries can mesh these ^{two potentials} / through relevant planning and support measures, the outcome might be modernized local industrial structures, geared to serving the rural areas and with linkages to national industry as well. Such rural industry could provide employment, increase incomes, slow rural-urban migration, increase the supply of goods and services to farmers, ~~small industrialists and rural households at lower cost and finally stimulate further rural and regional development.~~

^{and encouragement}
Expansion / of industrial activity at the rural level at an early stage of agricultural development, permits a more rational spatial distribution of industrial and economic activity than might otherwise occur. Much of rural industry is likely to be located in market towns. That would generally be a more desirable form of urbanization than the expansion of already large urban

centers. Modernization of agriculture creates a demand which has considerable potential for instigating industrial / activity into rural towns. These industries are, in general, small; and their interaction with medium and large enterprises is, in the long run, essential. Countries need to pay attention to /selectively decentralizing some urban-based industry, with little or no economic sacrifice, in order to achieve better interaction and more balanced distribution of industrial activity. At the same time, with an industrial base to provide for continuing expansion and development, such regional centers can serve to attract and retain professional and technical skills that otherwise tend to concentrate in the major cities.

Apart from the linkages with agriculture itself, there are other important cross-sectoral requirements for rural industry. The provision of electricity, fuel, water and other utilities is essential for industry. Arrangements for the supply of raw materials and for the marketing of products may have to be implemented to sustain industrial activity. The reservoir of potential skills--technical and entrepreneurial--in the rural areas is often large and unless a country make special efforts to upgrade the skills, to improve tools, to diversify production, to open up markets and to change the outlook of the rural artisans and prospective entrepreneurs, this important asset threatens to disappear. It would seem natural for countries to make special efforts to upgrade the skills and organization of /people like village blacksmiths, carpenters, shoemakers, weavers and potters, so that they could assume manufacturing, processing and service roles in modernizing rural communities.

In the same way that agricultural extension services are considered essential for introduction of new technology and development of agriculture, industrial extension is a necessary element in developing rural industry. Development of rural industries necessarily requires a nationally supported program to provide the required inputs like credit, raw materials, equipment

purchase, electricity and other utilities, training for technical and managerial skills, and appropriate R&D facilities. In some cases these inputs may best be provided through institutional means. Provision of such a package should be an integral part of a development program aimed at the rural poor. Indeed, the general lack of rural development planning cannot be more clearly illustrated than by the weakness of efforts to promote industrial ^{entrepreneurship} at the rural level.

The variety of programs and approaches that need to be examined confirms that no single package or formula is likely to be a solution. On the contrary, the activity mix most likely to work is the one that is tailored to fit a particular, and ~~possibly~~ unique, set ~~of conditions and~~ ^{of} country conditions and circumstances.

It is clear that the initiatives, commitments and decisions must come from the country. With all the good-will, dedication and assistance that outside entities, whether bilateral, regional or international, are prepared to provide to a country to alleviate poverty, there is little that can be achieved without the country in question fulfilling its responsibilities. Self-help in this context, is truly the warp of the development fabric woven by a country.