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**APPROPRIATE TECHNOLOGY
FOR LIGHT ENGINEERING INDUSTRIES
AND RURAL WORKSHOPS**

.....
**RURAL INDUSTRY
Background Paper**

RURAL INDUSTRY

by

The National Industrial Development Corporation Ltd.

India

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INTRODUCTION

The subject of rural industries has gained importance in recent years and the rural industries have come to be regarded as an effective means for improving the socio-economic conditions of rural masses especially in developing countries which are generally characterised by agrarian economies, unemployment problems, lower level of physical and institutional infrastructure, non-availability of technologies, scarcity of capital investment and lack of skilled and managerial personnel. Small and rural industries by their very nature involve lower investments per unit output and employment generation potential, involve simple technologies and help achieve wider dispersal of industry and better distribution of national wealth.

This Paper has been prepared in three main sections. The first section defines what rural industry is and establishes rationale for such industries. The second section deals with development of small and rural industries in India - the place of small and rural industries in industrial sector, facilities and incentives for their development, present status, appropriate technologies, impediments to growth and India's experience etc. The third and the last section deals with the identification of major problems of appropriate technologies in the small and rural industries sector and the contributions which international organisations could make in overcoming such problems.

I. RATIONALE FOR RURAL INDUSTRY

It is only recently that one has begun to hear about emphasis in most developing countries on the need for rural industry. At first glance one may be tempted to a simplistic assumption that rural industry is something quite different from industry in urban areas. This would be most fallacious and misleading. Industry, as the term commonly connotes, implies the conversion of materials from one form to another and the methods and systems for their use and upkeep as a part of the total economic activity. Flowing from this, the basics of industry - whether rural or urban - remain the same. The difference really arises in the contributions which rural industry is expected to make to the socio-economic betterment of the population, with particular emphasis to the rural population itself. In saying so it should not be understood that industry in urban and semi-urban areas has no contribution to make to the socio-economic betterment of the rural population. Each has its own place as a critical element for total integrated development.

There has been, and continues to remain, a measure of confusion in clearly defining what constitutes rural industry. Does it mean the location of

industry, large or small in rural areas irrespective of the appropriateness of such location? Does it imply industry tended primarily to suit the needs of the rural population irrespective of whether it is located in a rural or urban area? Or does not it denote industrial activity in a rural area based largely on the output of other rural activities, primarily agriculture and forestry?

There can be no single classic interpretation of what constitutes rural industry. It would necessarily have a different flavour and meaning in different countries depending upon their circumstances. Even within the country, particularly if it is a large one like India, the concept of what constitutes rural industry could differ from region to region. It must, therefore, remain the responsibility of those involved in economic development to clearly define what is meant by rural industry for their particular circumstances and to then evolve plans to meet the desired objectives.

For example, in India, it is now generally agreed that rural industry implies the establishment of industrial activity in a rural setting either for meeting rural needs or to utilise the outputs of

other rural activities, or a combination of both. Within the country, however, differences in emphasis have necessarily arisen because of the widely varying circumstances from one region to another. For example, with the somewhat faster economic growth of the rural sector in certain parts of the country, the needs of the population in these areas is today quite different from the needs of the population in other regions where the economic strength and development is considerably lower. Similarly, inherent skills vary considerably from one region to another in the country and if these are to be taken advantage of, the concepts of rural industry become different.

Mention has been made earlier to the fact that industry covers both manufacture, the servicing and utilisation of manufactured products. Unfortunately, there has been a general tendency all over to over-emphasise the manufacturing aspect of industry and to overlook the equal if not greater importance of the service and utilisation aspect of industry. It is necessary to pin-point this matter because it has very great relevance to developing countries which are beset with two intractable problems of lack of adequate financial resources and the need to

generate large employment potentials for their growing populations. It has also a direct bearing on the availability of skills and their utilisation. If emphasis continues to be limited only to the manufacturing sector of industry, not only would the objectives of economic development through industrialization remain unfulfilled, what is worse the obvious benefits to be gained through the development of the servicing sector of industry would be lost. It is to be hoped that in considering measures for industrialization in the rural areas due emphasis would be placed on the servicing sector of industry.

One may legitimately ask the question why rural industry? In most of the developing countries ^{the} bulk of the population has been and continues to be traditionally engaged in agriculture and other rural activities such as forestry, animal husbandry, fishing etc. The methods employed in performing these activities have largely remained traditional and wholly uneconomic by modern standards. These activities, therefore, in themselves do not provide a direct means for raising the economic levels of the rural population - which after all is the

bulk of a country's population.

With growing populations the pressure on land is constantly increasing in most developing countries. Irrespective of whatever measures may be adopted by concerned Governments, unless avenues for other activities can be created in the rural areas there will perforce be movement of populations from the rural to the urban and semi-urban areas. Wherever this phenomenon has raised its head already, serious problems have arisen in the urban and semi-urban areas. It is, therefore, agreed all round that all possible measures need to be taken to avoid the migration of rural populations to urban and semi-urban areas. In fact, some countries have gone to the extent of beginning to think about the possibilities of reverse migration. This, therefore, is yet another important factor which necessitates the creation of new economic activities in the rural areas. Industry in all its facets can make a major contribution to this.

Most agricultural activity is seasonal and leaves the farmer and his family with considerable time on hand. Developing countries - particularly those with inadequate populations - can ill afford to lose such

manpower. On the other hand, it is not practicable to expect such populations to migrate for short periods elsewhere to carry out other activities. The only way to make fuller use of the manpower in rural areas during off-seasons is to create activities in which they could be gainfully employed closer home. This, therefore, is yet another important aspect of the problem of economic development which rural industrialization seeks to resolve.

If an industrial activity - including manufacturing and services - is to operate successfully and contribute meaningfully it must be appropriate to the circumstances of the environment in which it is called upon to function. Most industrial activity, as is generally understood today, is the outcome of technological developments in the highly industrialised countries of the world. These technologies, developed over the years, have today reached levels where most of them function optimally only when the scale of operation is fairly large, the skills needed are very high, investments per unit employment are excessive and the related physical and

organisational infrastructure is of a very high level. There would be rare cases in the developing countries where these factors can be even marginally satisfied in the rural areas. Development of rural industry on the basis of such technologies is, therefore, foredoomed to failure. What is needed is a totally different concept which allows for the lower levels of skills, greater utilisation of manpower, minimal infrastructural facilities and ^{the} least investment per unit of labour generated.

Traditionally most developing countries which have achieved independence in the last two or three decades have been providers of basic raw materials - whether through the extractive industry or through agriculture and forestry for the manufacturing industries established in the highly industrialised countries. Heaviest emphasis has, therefore, been on the utilisation of agricultural and forestry produce for further processing elsewhere. Little attention has been paid even by the technologically advanced countries to making gainful use of the wastes created during agricultural production etc. and yet, many of these waste materials can be easily processed

and converted into very high value added products. In conceiving technologies appropriate to rural industry, there will be need for very heavy emphasis on better utilisation of the waste materials generated through other rural activities.

It is, therefore, obvious that if industrialisation in the rural areas is to become an effective instrument of raising the economic standards of the rural population and hence that of a country as a whole it will not be enough to limit oneself to evolve appropriate Government policies or to the allocation of needed funds. Perhaps the most important single factor which will determine the success of rural industrialisation will be the development and ready availability of technologies and industrial concepts suited to the circumstances of the rural areas. These will vary from country to country and therefore call for a massive programme which cannot be furthered without the total commitment not only of a country itself or a group of countries but by all countries of the world.

The importance of entrepreneurship to industrial development is now well recognised all over. What is, however, not yet fully appreciated is that the type of entrepreneurship needed differs from area to area because of the obtaining circumstances. As such what would be needed by a successful industrial entrepreneur in an urban setting would be widely different from that required by his counterpart in a rural area. Because of lack of understanding of this factor, programmes of training and development of entrepreneurs wherever instituted have made little difference to the approach and emphasis on the different aspects of entrepreneurship for the rural and urban areas. The form of politico-economic policies notwithstanding it has been demonstrated over and over again that in the final analysis it is individual entrepreneurship that has brought success, particularly in the field of industrial activity. If rural industry is to make a significant impact on economic development it will be necessary to recognise that the entrepreneurship ^{needed} / for such industry is at considerable variance with the traditional concepts of entrepreneurship which have been based on forms of urban industry. It is to

be hoped that those actively concerned with the development of rural industry will now begin to give due attention to this matter and put evolved programmes and facilities tailored more appropriately to the rural entrepreneur. This matter must form an integral part of the total technology package and the development of appropriate technology.

Opportunity is taken here to briefly recall the Indian experiences during the last 30 years in developing rural industry before proceeding to define some of the problems, primarily concerned with technology in all its aspects, as it relates to rural industry.

II. INDIA'S EXPERIENCE IN DEVELOPMENT OF RURAL INDUSTRIES

India is a large country with about 576,000 villages which accommodate 80 per cent of the country's population. At the time of independence the country's economy was basically agrarian and was characterised by lack of productive employment opportunities arising from overdependence on agriculture and lack of other avenues of gainful employment in the rural areas.

After the independence of the country the Government laid emphasis on development of rural areas with the main objective of improving the socio-economic conditions of rural masses by generating further employment opportunities. The increase in earning potential of rural masses was considered essential to provide them the basic amenities of life i.e. food, housing, clothing, education, medical facilities etc. With this in view, the development of small and rural industries which are characterised by higher production and employment potential per unit investment was given special place in the development programmes of the country and this also formed an integral part of the industrial policy.

Industrial Policy

The salient features of Industrial Policy relating to small and rural industries are reproduced below:

"The Government of India would stress the role of cottage, village and small scale industries in the development of the national economy. In relation to some of the problems that need urgent solutions, they offer some distinct advantages. They provide immediate large scale employment; they offer a method of ensuring more equitable distribution of the national income and they facilitate an effective mobilisation of resources of capital and skills which might otherwise remain unutilised. Some of the problems that unplanned urbanisation tends to create will be avoided by the establishment of small centres of industrial production all over the country."

".....the aim of the State Policy will be to ensure that the decentralised sector acquires sufficient vitality to be self-supporting and its development is integrated with that of large-scale industry. The State will, therefore, concentrate on measures designed to improve the competitive strength of the small-scale producer. For this, it is essential that the techniques of production should be constantly improved and modernised."

Steps taken for Promotion and Development
of Small Scale Industries

The small-scale sector industries have generally to operate under the constraints of; lower levels of production which can be uneconomic, lack of R&D facilities for product design and product upgradation, lack of market research and development facilities, lack of adequate means for quality control etc. These and other similar factors make competition with medium and large-scale industries difficult. Keeping in view these factors and the vital contribution of small and rural industries to the country's economy, the Government introduced a number of promotional measures and concessions at the early stages of development, to enable small-scale industries^{to}/exist along with large industries.

In the Indian context small-scale industries are undertakings having investment in fixed assets of plant and machinery not exceeding Rs. 1.0 million. A higher limit of investment is allowed to ancillary small scale industries which are defined as undertakings having investment in fixed assets in plant and machinery not exceeding Rs. 1.5 million engaged in manufacture of parts, components, sub-assemblies, toolings or intermediates.

The Government reserved a large number of industrial products and product-lines for manufacture only in the small and rural industries sector. The number of items reserved for production in this sector was originally about 180 which has been increased to over 500 items over the years.

The facilities provided by the Government for development of small and rural industries include:

- Establishment of the Office of Development Commissioner Small Scale Industries (DCSSI) : to formulate policies and undertake orderly development of Small Scale industries.
- Establishment of the National Small Industries Corporation (NSIC) : to aid, counsel, assist and promote the interests of small-scale industries through providing facilities for hire purchase of equipment, establishment of training centres, marketing of small industry products etc.
- Establishment of Khadi & Village Industries Commission (KVIC): to conduct and encourage technical research with a view to improving the various equipment, implements, processes of production and per capita productivity etc. in the industries falling under its purview.

- Establishment of organisations like development Commissioner Handlooms, Handloom Development Corporation, All India Handicrafts Board, The Central Silk Board & Coir Board to ensure development of these industries.

Details about the functioning of these Organisations are provided in Annexure-1.

Other facilities available to the small and rural industries are discussed as under:

Stores Purchase Programme

Under this programme, certain classes of stores are reserved for purchase from cottage and small-scale industries and at preferential prices in certain cases. Over 240 items are exclusively reserved for purchase from the small-scale sector. The value of such purchases during 1975-76 was of the order of Rs. 942 million.

Financial Assistance

Small-scale industries are treated as one of the priority sectors for extension of credit. Among the units in ^{the} small-scale sector, very small artisan and cottage units get loans at a nominal rate of interest of 4 per cent per annum upto a certain limit. The interest rate is graduated

upwards for borrowings of higher amounts. The inflow of credit to the small-scale sector from scheduled commercial banks has been increasing steadily. It increased from Rs. 598.0 million in 1972 to Rs. 10,400 million in 1977. State Financial Corporations also provide medium- and long-term loans to small scale industries. Loans on liberalised terms are also available to small-scale industries including industrial co-operatives under the State Aid to Industries Act. In addition, the Government of India has introduced since 1960 a Credit Guarantee Scheme with the object of enlarging the supply of institutional credit to small-scale sector by offering protection against any possible losses. ^{The} Reserve Bank of India has been entrusted with the administration of the scheme as the agent of the Government and has been designated as the "Guarantee Organisation". In order to provide further effective financial support for promotion of small, village and cottage industries under the revised policy of the Government, the Industrial Development Bank of India has taken steps to set up a separate wing to deal exclusively with the credit requirements of the small-scale sector. It will co-ordinate, guide and monitor the entire range of credit facilities offered by other institutions for the small and cottage

sector for which separate wings will be set up in these institutions particularly the nationalised banks. Banks will also be expected to earmark^a/specified proportion of their total advances for^{the}/promotion of small, village and cottage industries. It is the policy of the Government to see that no worthwhile scheme of small or village industry is given up for want of credit facilities.

Subsidy for Backward Area Development

The Government provides for special concessions and incentives for establishment of industries in backward areas. Under this scheme provision has been made for credit assistance from financial institutions on concessional terms for large and small industries located in the backward districts and also for outright subsidies the rate of 15 per cent of capital investment for industries located in backward districts/areas; subsidies the rate of 50 per cent on transport of raw materials and finished products in certain specified backward and remote areas ^{are} /also available. The scheme for concessional financial assistance from national financing institutions covers about 246 backward districts. The number of districts covered under the scheme for providing central outright grants/subsidies on fixed investments is over 100.

Training of Manpower

Considering the need for intensive training programmes for rural industries to enable them^{to}/produce quality products to compete with large industries, the Government has established centres for training of workers in the form of Proto-type Development and Training Centres under the NSIC. As discussed earlier there are four such Centres in the country established at Delhi, Calcutta, Rajkot and Madras. These Centres have already trained about 10,000 workers for small and rural industries. The Government has also introduced^{the}/Rural Industries Programme which is in operation in about 100 selected areas. The Rural Artisans Programmes aim at providing for upgradation of skills through training in the use of improved tools and equipment. About 8300 artisans have been trained under these programmes.

As a result of the above measures, the small-scale and rural industry sector has emerged to be of great importance to the Indian economy. The contribution of this sector will become clear from the following description of the present status of this sector:

Present Status of Rural Industries

The small-scale and rural industries for purposes of planning and development are placed in 6 groups, though the line of demarcation between them is not always clear-cut. These groups are :

- 1) Small scale industries
- ii) Handlooms
- iii) Khadi and village industries
- iv) Handicrafts
- v) Sericulture and silk
- vi) Coir

The broad break-up of the estimates of production, employment and exports from small scale and rural industries are as given in Table-I below:

TABLE-I

Production, employment and exports
of Small Scale and Rural Industries

| Industry | Production (Rs. in million) | Employment (Million numbers) | Exports (Rs. in million) |
|--|-----------------------------------|------------------------------------|--------------------------------|
| 1. Small-Scale Industries - Factory Sector | 49920 | 2.0 | |
| 2. Small-Scale and Rural Industries - Non- Factory Sector : | | | 5000 |
| i) Modern small-scale industries | 17100 | 1.5 | - |
| ii) Handlooms | 12000 | 7.0 | 920 |
| iii) Handicrafts (including jewellery) | 3800 | 1.4 | 1904 |
| iv) Khadi & village industries | 1600 | 2.0 | 2 |
| v) Silk (Sericulture) | 1000 | 3.2 | 127 |
| vi) Coir | 400 | 0.5 | 179 |
| Total | <u>35900</u> | <u>15.6</u> | |
| 3. Total of (1) and (2) (excluding household units not accounted above) | 85820 | 17.6 | 8132 |

Impediments to Growth of Rural Industries

The major emphasis in rural industrialisation programmes has been on the manufacturing side and very little attention has been paid to the service industry which is equally, if not more important. This has resulted in under-utilisation of capacities and closure of many units.

Limited efforts have been made for promotion of sales organisations in rural areas. Such efforts have been organised from the urban centres moving into rural areas. The sales promotion effort required for rural areas is somewhat different from those required for the urban areas. The urban sales executives, have many times, mis-calculated and misinterpreted the requirements of rural masses which have led to the production of products totally unacceptable to the rural masses. A classic example of this is the production of "Janta Radio Sets" which were low-priced radio receivers meant for rural masses. When introduced for sale in the rural areas they did not find adequate markets mainly on account of

the fact that the rural masses had no requirement for such sets because their need was met by the community radio sets provided at the Community Centres and it was later on found that what the rural areas needed was medium-priced sets to be given as presents in marriage.

Rural industries have been established through various incentives provided by the Government but very little attention has been paid to create facilities for^{the} supply of spare parts, after-sale service and maintenance, with the result that the rural industries have to depend basically on urban and semi-urban centres for such facilities which contribute to long delays and higher costs which the rural industries can ill afford. Such service industries could advantageously contribute to the employment in rural areas apart from making the rural industries less dependent upon urban and semi-urban areas for their maintenance needs. This has also to some extent added to the resistance of the rural masses to products which otherwise could have found markets in the rural areas. For example, a farmer would avoid using automated agricultural equipment where repair facilities were not readily available.

One of the greatest flaws in the process of rural industrial development in India has been that ^{the} rural population or at least those who know about the problems of rural industries are not being involved in the planning process. Thus the exact requirements of rural industries have never been identified and only half-hearted attempts have been made in this area which have not yielded the desired results.

Another vital factor which has led to the rather slow growth of rural industries has been on the front of the appropriate technology. Though the country has achieved good results in certain industries the basic approach to the development of rural technologies has not been the best in all rural industry areas. The main emphasis in the development of appropriate technologies has been on the de-scaling and miniaturisation of large-scale technologies to suit the requirements of the small and rural industries which for obvious reasons cannot be successful because irrespective of whether the product has been produced in ^a large, small or rural sector of industry the consumer wants products of proper quality which the small and rural industry has generally not been able to produce with the present

approach to the problem. The best approach under these circumstances would be disaggregation of technology reserving the component of technology that needs high quality control and sophisticated equipment for large industries and the operations involving labour-intensive methods to small and rural industries. As for example in the case of leather industry the production of appropriate quality of leather for uppers and soles could be reserved for large sector tanneries and the operations for cutting, stitching and finishing of the leather products could be left to ^{the} small and rural industry sector. This would provide the advantage of producing high-quality products as well as generation of employment opportunities in rural areas.

Corrective Action under Revised Industrial Policy

Some of the difficulties experienced in the past have been alleviated by the revised Industrial Policy announced by the New Janta Government in December, 1977. The revised Policy is highly oriented in favour of small and tiny industries. Under this Policy whatever can be produced by small and cottage industries would be only so produced and there is

provision for introduction of legislation in this regard. To facilitate the implementation of this idea, the Government has expanded the existing list of items reserved for production by the small-scale sector from 180 to over 500 items. The Government would also ensure, through suitable measures, that the production in this sector is economic and of acceptable quality.

In order to ensure effective implementation of the revised policy the Government envisages establishment of District Industries Centres (DICs) all over the country which will be located at the District Headquarters, instead of the present system where most of the organisational set-up for small and rural industries is located at the State capitals. The DICs would provide all services and support available to small and rural industries under one roof instead of entrepreneurs having to run from one place to another to seek the available assistance. The composite facilities available at the DICs would include supply of machinery and equipment, raw materials, credit facilities, assistance in marketing arrangements and quality control etc. The DICs would also co-ordinate the work of extension staff of develop-

ment blocks in respect of rural and cottage industries etc. About 188 DICs have already been established in the country and the proposal is for^{the} establishment of 460 such centres by 1981-82. The Central Government would provide the initial capital cost for the establishment of DICs and also 75 per cent of the recurring cost of the personnel of such DICs.

Appropriate Technologies

Appropriate technologies have been evolved in India with a view to maximise the use of local raw materials and other inputs, to generate maximum job opportunities with minimum capital investment and ensuring maximum outputs with available levels of infrastructure.

Another aspect of appropriate technology introduction in rural industries has been to improve the existing equipment, tools and methods of production to improve productivity.

Some of the agencies engaged in appropriate technologies are: Central Government Agricultural Engineering Workshops, State Departments of Agriculture, State Agricultural Universities, State Agricultural Engineering Workshops etc. The Ministry of Industry^{of the} Government

the
of India has also a cell for/promotion of Appropriate Technologies. Organisations like Development Commissioner Small Scale Industries, National Small Industries Corporation, Khadi and Village Industries Corporation, Development Commissioner Handlooms, Silk and Coir Board also undertake programmes relating to appropriate technologies in their respective areas of operation.

the
India has established/ Council of Scientific and Industrial Research (CSIR) which is funded by the Government. CSIR has a chain of 30 national laboratories and institutions undertaking research in different scientific fields. The National Research and Development Corporation (NRDC) undertakes commercialisation of the research work done in the country. Though these scientific institutions have done valuable work in certain scientific fields their contribution to rural industries has been limited.

The Khadi and Village Industries Commission has undertaken research in a number of industrial areas falling under its purview with a view to improve the productivity and to increase the earning capacity of the rural artisans. This paper attempts to discuss the effects of such research effort in industries like edible and non-edible oils, leather, sweetening agents, cane and bamboo industry, potteries etc. by way of illustration.

Some of the rural industry fields have been covered in other papers and as such all industries have not been dealt with in this Paper to avoid repetition.

The main aspects dealt with are the status of industry, the areas in which Research has been made, the effects of such Research effort, gaps in technologies and suggested measures etc.

The main technological gaps in the industries examined are given below. These gaps^{are} to be bridged to enable these industries reduce their production costs with a view to improving the earnings of rural entrepreneurs. Some such gaps in technology are mentioned below for village industries such as edible and non-edible oils, leather industry, sweetening agents, cane and bamboo industry and pottery industry, by way of illustration:

- i) Improvement in the efficiency of oil-pressing equipment and improving the shelf life of the oil for the Ghani oil industry;
- ii) Development of suitable seed driers and decorticators for minor oil seeds in general and rubber seeds etc. in particular;
- iii) In the case of^{the} leather industry, according to the present practice of preparing meat meal and bone meal, the product cannot be sterilised and production can't be increased due to limitations of

equipment and high fuel consumption. There is need for mechanisation by introducing a suitable plant which could process meat and bone together, resulting in the production of sterilised bone and meat meal. Similarly, the practice of stitching the partly tanned raw hides into bags in the process of bag tanning is still being followed which is highly wasteful. With the introduction of a suitable improved appliance, artisans can increase their turnover of tanned leather;

- iv) In the sweetening agents industry, technological improvements are essential for the introduction of a continuous juice settler for the Khandsari units, designing of juice boiling equipment of ^{the} film evaporator type for Gur and Khandsari industry and development of graining techniques for improved crystallisation ^{using the} open pan sulphitation sugar manufacturing process for cube sugar;
- v) In the cane and bamboo industry it is necessary to modify the existing equipment to prepare splints and flats on the pattern of Japan's equipment with suitable modifications to be used on local raw materials;
- vi) Introduction of potters' wheels with ball bearings in place of traditional wheels are essential for better speed and production of better quality products. Other innovations for this industry would include ^{the} introduction of better methods for cleaning clay and separating foreign material from it for kneading and firing etc.

The details may be seen at Annexure-2.

III. MEASURES FOR INTERNATIONAL ORGANISATIONS FOR DEVELOPMENT OF APPROPRIATE TECHNOLOGIES

A number of International Institutions are engaged in the development of appropriate technologies. Some of the major institutes being Intermediate Technology/^{Development}Group of England and its branches all over the world, ^{the}Brace Research Institute in Canada, VITA, Movement of New Society, Tool Foundation (Netherlands) etc. These institutions are taking up appropriate technology projects in different areas.

In the following paragraphs some of the major problems associated with appropriate technologies have been identified. The International Institutions engaged in development of appropriate technologies could possibly contribute to overcoming such problems by re-orienting their R&D programmes to suit the needs of rural industries in developing countries.

One of the basic concepts which has to be kept in view while on the subject of rural industries is that the requirements of rural industries in developing countries are basically different from those of the urban industries. The basis difference arises from the factors such as type

of entrepreneurship, relevance of product designs and their specifications to ensure their conformity to the rural needs and the preferences of rural population, development of technologies utilising the raw materials and waste products available in the rural sector, the level of physical infrastructure available and last but not the least the level of skills and maintenance facilities available in the rural areas.

Entrepreneurship

The entrepreneurship needed for rural industries is basically different from that required for urban industries. The rural entrepreneurs have to preferably come from the rural areas themselves and should be provided with necessary basic training in industrial production, management and marketing etc. Keeping in view the level of rural entrepreneurs and constraints under which such entrepreneurs have normally to operate the local Governments have to undertake simplification of procedures specially those relating to making facilities available to the rural industries, accounting procedures etc. The international Organisations could provide financial assistance for training of rural entrepreneurs.

Appropriate Product Designs

One of the vital areas for rural industrialisation is the evolution of proper product designs to suit the available raw materials and at the same time to suit the requirements of rural population. In conceiving appropriate technologies and product designs for rural needs, it is necessary to bear in mind the level of maintenance and servicing facilities and types of raw materials available to the rural entrepreneurs. Past attempts to presume that what is good and acceptable by the urban population would be equally acceptable by the rural population has been proved to be incorrect, e.g. high-value consumer products like fancy shoes liked in urban areas may not be acceptable to/wide section of^{the} rural population. The rural population may be willing to pay the high price but it may prefer the shoe design which would last longer under the conditions prevalent in rural areas. Attention must, therefore, be devoted to the development of new products or adjustments made to existing products so that they suit the specific needs of the rural areas. This would entail R&D activity to undertake product design & product development suited to rural industries. International Institutes engaged in Appropriate Technology work could assist in the development of appropriate product designs.

Technology for Manufacture

It is necessary to rid oneself of the hitherto prevalent idea that if a given technology could be descaled or miniaturised in the scale of operation, it would automatically become appropriate for rural industry.

The technology of manufacture really appropriate to rural industry is one which makes use, to the maximum possible extent, of the materials readily available in rural areas, and technologies which can operate ^{by} using the levels of skill readily available in the area ^{and which} need a minimum of physical and organisational infrastructure. In addition, if one can also reduce the size of operations, this would be an added advantage. Existing technologies have to be examined from this point of view and the changes have to be brought about to suit the environment. How this could be done on a continuing basis is a matter to which attention has now ^{to} be devoted. Another fallacy in thinking about appropriate technology has been that the total manufacturing content must remain at one place. There is hardly any manufactured product today which does not involve a number of different processing technologies. Attempts to provide for all the technologies concerned cannot be successful in the case of rural industry

because some elements of these technologies necessarily call for^a/high degree of sophistication, skills,^a/large volume of production and heavy investments. What could be advantageously done would be to take a careful look at the combination of process technologies relating to^a/given product and to separate out those individual technologies which lend themselves^{to}/better and easier operation in a rural environment. In other words there is^a/need to give careful and greater consideration to sub-dividing the total package of technology and^{to}/horizontal integration between elements undertaken by rural industry and elements undertaken elsewhere whether in large-scale or other operations. International organisations can assist in funding projects for such technological adaptation and gear the working of international intermediate technological institutions to undertake projects of this nature.

Service Industry

The service sector of industry which has hitherto been broadly neglected in rural areas needs now be brought to the forefront. Programmes need to be evolved which could help the growth of^{the}/servicing sector in the rural areas. This would include measures for the training of^{the}/rural population in the marketing, in after-sale service, in

maintenance and in other such operation ensuring availability of such facilities within easy reach of the rural industries. In fact, if priority emphasis is placed on development of this sector of rural industry it would go a long way in quickly generating new employment potential, it could be got underway with low investments and the skills needed could also be developed in short time. International Organisations could assist establishment of Service industries.

Utilization of Waste Products

In the rural industrialisation programmes there is need to devote greater attention to the programmes of utilisation of waste materials, commonly accruing in the rural areas of developing countries. This would include utilisation of potential sources of energy such as cow dung for production of bio-gas, agricultural grasses and other wastes for manufacture of straw board, use of solar energy for drying of grains and other agricultural products; utilisation of paddy husk for production of activated carbon, utilisation of baggase and molasses for production of industrial products etc.

What is needed urgently is the need to develop technologies for using such waste materials which are abundantly available in the rural areas. If appropriate technologies can be developed for processing of such waste materials it would serve

the dual purpose of converting the waste material into useful products and generation of work places for the rural masses.

While the international institutions engaged in the development of appropriate technologies could undertake projects relating to the problems identified above and come up with appropriate solutions, the international organisations providing funds for industrial projects in developing countries may also give priority to funding projects relating to rural industries on^a/preferential basis and also_{to} providing training facilities in the areas of maintenance for rural industries etc.

The programmes of rural industrialisation in developing countries can also be accelerated through the joint efforts of national Governments in developing countries and the international organisations. The national Government may pay the ^{necessary} / attention to reorient scientific education, training and R&D programmes to gear them to the needs of rural industries instead of such programmes being carried out on the lines in which they are conducted in developed countries whose technological requirements are of a more sophisticated nature. The international organisations must encourage such programmes in developing countries through technical and financial assistance.

Annexure 1

ORGANISATIONS ESTABLISHED BY THE
GOVERNMENT FOR PROMOTION AND DEVE-
LOPMENT OF SMALL SCALE INDUSTRIES

Development Commissioner Small Scale Industries (DCSSI)

DCSSI is the parent organisation established in 1954 for promotion and development of small scale industries. It provides technical, economic & management consultancy services in matters of perspective lines of investment, preparation of project reports, upgrading skills, increase of productivity etc. DCSSI has a net-work of 16 small industries service institutes, 19 branch institutes, 45 extension centres, 2 training centres, 5 production centres and four regional testing centres. There are also design institutions and regional testing centres, proto-type development and training centres for small scale sector. Small Industries Extension Training Institute (SIET) provides extension services to small units. Main functions of DCSSI are:-

1. Formulation of policies and taking appropriate decisions in regard to orderly development of small scale industries in the country.
2. Creation of the requisite atmosphere and provision of necessary facilities that would encourage growth of small scale industries.
3. Evaluation of the condition of the industries in the country including economic surveys, etc. in order to be able to decide upon priorities of different types of industries in the country.

Annexure 1 (contd.)

4. Facilities for imparting necessary training to technicians and the field training for encouraging proper development of industries in the small-scale sector.
5. Collection of statistics which alone can guide the organisation about priorities to be given for the development of industries and to ensure that there is no lop-sided progress.

One of the major functions of this Organisation is to provide technical assistance to small-scale units through field organisations of Small Industries Service Institutes and Extension Centres. The field organisations are charged with the responsibility to conduct:-

- (1) Surveys of particular industries and areas to make concrete recommendations for the development programme.
- (2) Advise small units on improved technical assistance and use of modern machines and equipment.
- (3) Demonstrate the use of such technical processes through model and mobile workshops.
- (4) Instruct small industrialists in proper methods of business management including marketing.
- (5) Act as ^{an} information centre including the publication of bulletins and pamphlets, model schemes etc. for guidance to small-scale industrialists.
- (6) Carry on research programmes such as proper use of raw materials, improved design and machinery etc.

The National Small Industries Corporation (NSIC)

The National Small Industries Corporation (NSIC) was established in 1955 to aid, counsel, assist and promote the interest of small-scale industries. The Corporation is now assisting the entrepreneurs in hire purchase of equipment, formulation of technical studies, marketing and Government purchase programmes. The Corporation has four Proto-types Development & Training Centres at Delhi, Calcutta, Rajkot and Madras. The Corporation has so far, supplied machinery to 30,000 units worth Rs. 850 million providing employment to 0.5 million persons. The Proto-type Centres have trained about 10,000 workers for small industries. The Government purchase division has over 20,000 small units on its register and has been responsible for supply of products by these units worth Rs. 4000 millions. The marketing division of the Organisation has been responsible for marketing Rs. 50 million worth of materials and products of small industries. It has also developed capabilities for establishing a number of small and rural industries on turn-key basis.

Khadi & Village Industries Commission (KVIC)

The Khadi & Village Industries Commission was established in 1957 to conduct and encourage technical research with a view to improving the various equipment, implements, processes of production and per capita productivity, reducing the cost, increasing the saleability of products and earnings of artisans in rural areas in the following industries falling under its purview:

Annexure 1 (contd.)

1. Khadi - Cotton, Silk & Woollen
2. Processing of Cereals and Pulses Industry
3. Ghani Oil Industry
4. Cottage Match Industry
5. Village Leather Industry
6. Manufacture of Cane-Gur and Khandsari Industry
7. Palngur Making and other Palm Products
8. Non-Edible Oils and Soap Industry
9. Handmade Paper Industry
10. Bee-Keeping Industry
11. Village Pottery Industry
12. Fibre Industry
13. Carpentry & Blacksmithy Industry
14. Lime Manufacturing Industry
15. Shellac Industry
16. Manufacture of Gum Resins Industry
17. Manufacture of Katha Industry
18. Fruit Processing and Fruit Preservation Industry
19. Cane & Bamboo Industry
20. Gobar (Methane) Gas Industry
21. Manufacture of Household Utensils and Aluminium
22. Collection of Forest Plants and Fruits for Medicinal Purposes

The programme among others, covers research and experiments in the design and fabrication of improved equipment, modification in existing implements and improvements in various processes of production. In recent years, attention has also been paid to identifying new raw materials, product development and diversification of

Annexure 1 (contd.)

production activities. The work is carried out mainly through Design Research-cum-Experiment and Extension-cum-Training Centre (DREET) Nasik and Research Institute for Village Industries, Wardha (Maharashtra) and Research Laboratories/Institutes and Regional Research Units/Centres under the State Industry Directorates.

Under its training programme, the Commission conducts various courses in Khadi and Village industries departmentally and mostly through sponsored institutions, for various functionaries such as technicians, supervisors, managers, in addition to artisans. Besides, regular and refresher courses in improved equipment and processes, training in salesmanship and various management courses for management personnel of institutions, are also conducted.

Handlooms

Handlooms (hand-weaving of cloth from yarn produced by mills) represent an important segment of rural industries from the point of view of dispersal, employment and exports. A Development Commissioner has been appointed at the Centre and most of the States have separate Directorates in charge of handloom development. On the institutional side, in addition to apex co-operative institutions responsible for production and marketing of handlooms in the co-operative sector, a number of States have constituted Handloom Development Corporations to take care of the needs of the large number of weavers who are still outside the co-operative fold.

Handicrafts

Handicrafts embody the traditional skills of artisans who use a variety of materials - wood, metal, clay, ivory, cloth etc. to produce consumer articles as well as decorative or artistic products. Nowadays the latter category of products is understood as handicrafts.

India has been famous for centuries for her richly brocaded sarees, metalware of exquisite workmanship, wooden toys, artistic pottery, ivory carvings, papier mache products etc. Indian handicrafts and cottage industries declined considerably during the period of foreign rule owing to factors such as diminished indigenous demand, competition from imported goods, loss of patronage, apathy of the foreign rulers etc. The revival of Indian handicrafts has been one of the important gains of Government's policy in independent India. Promotion and exports of handicrafts falls under the purview of the Handloom and Handicrafts Export Corporation.^{The} All India Handicrafts Board has been established as a Central organisation for development of Handicrafts, the Board has five regional offices, four Design and Technical Development Centres and 24 marketing Extension Centres.

Sericulture and Silk

Sericulture and silk is another important rural industry. India has the distinction of producing all the four commercially important varieties of silk viz. Mulberry silk and non-mulberry silk consisting of Tassar silk, Ery silk and Muga silk. The Central Silk Board was constituted in 1949 to guide the development of the industry.

Annexure 1 (contd.)

Coir

Coir from coconut husk forms an important cottage industry in the coastal districts of Kerala and Tamil Nadu. The Coir Board assists the industry to increase its exports and improve the quality of its products such as yarn, mats, matting rugs, carpets, ropes etc.

Annexure 2

GAPS IN TECHNOLOGY AND SUGGESTIONS
FOR SOME RURAL INDUSTRIES

Realising the importance of rural industries to the Indian economy the Government of India set up Khadi and Village Industries Commission to look into the problems of specific industries and introduce necessary measures for improvements. The status and the problems of some of the industries falling under the purview of the Commission, which have ^{otherwise} made significant progress, are considered below:

EDIBLE OIL

Ghani oil industry is an age-old cottage industry in India. At the beginning of this century there were about 0.5 million persons employed in pressing oil with the aid of Ghanis. However, the employment in this village-based industry has declined with the rise of expellers, rotaries and mills after the 30s.

The total oil-seed production in the country was around 9.2 million tonnes in 1970-71, of which it is estimated that about 30 percent is processed in traditional Ghanis. With the inroad of baby expellers and rotaries in semi-urban areas and increase in the consumption of refined oil, the Ghani oil industry is facing direct competition from the mill industry. However, it is observed that there is a clear consumer preference for

Ghani oil in the country side due perhaps to its better flavour and supposedly better nutrition value. This has been mainly responsible for the survival of a large number of Ghanis.

Gaps in Technology

Some of the factors which have been responsible for decline of the Ghani oil industry are:

- i) One of the disadvantages of Ghani oil is the low keeping value of the oil.
- ii) The Ghanis are worked by bullocks, the rise in cost of fodder during the last few years has made production cost rather high.

These factors have rendered the operation of Ghanis more and more uneconomic over the years, notwithstanding, the favourable factors of palatability of Ghani oil and the existence of a strong consumer preference for it.

Suggestions

Improvement in the efficiency of oil processing equipment, seed improvement for improving the keeping of quality of oil and cake can make Ghani oil industry more competitive with the oil mill industry.

NON-EDIBLE OIL AND SOAP INDUSTRY

The non-edible oil and soap industry serves three purposes viz. it produces useful commodities from such natural resources which generally remain un-utilised and hence wasted, it augments the supply of edible oils and fats for human consumption for the non-edible oils can be used as a good substitute for the edible oil in the soap manufacture, non-edible resources can offer supplementary employment specially in hilly and backward areas.

Status of Industry

The total production of oil seeds in the country is about 9.0 million tonnes of which availability of non-edible oil seeds is in the range of 6.6 million tonnes. The main varieties of non-edible oil seeds in India are Sal, Mohwa, Neem, Karanja etc. Against this vast potential, the total collection is only about 80,000 tonnes. The industry has, however, made good progress, production in 1955-56 was worth Rs. 0.27 million which increased to Rs. 17.3 million in 1970-71.

Gaps in Technology and Suggestions

The planning group on village industries was set up by the Government with a view to increase the utilisation of non-edible oil seeds, remove technical difficulties and reduce the oil shortage in the country. The major problems & suggestions reported are:

- i) Development of suitable seed drier and decorticators for minor oilseeds and rubber seeds, dhupa seeds, mohua kernels and neem fruits etc.
- ii) Lack of development research on utilisation of the lipid associates lipids (oils) and seed meals of major and non-edible oilseeds. Research needs to be carried out in order to effect the maximum utilisation of oilseeds.

Annexure 2 (contd.)

LEATHER INDUSTRY

Leather industry is one of the oldest cottage industries in India. With the coming up of large tanneries and factories for manufacture of leather footwear and other leather goods the rural artisans have been adversely affected. The total number of artisans working in this industry which was about a million at the beginning of the century has been reduced to about half this number. The importance of leather industry in India is clear from the fact that the country earns about Rs. 1000 million worth of foreign exchange through export of leather and leather products.

PROGRAMMES OF KHADI AND VILLAGE INDUSTRIES COMMISSION

The Khadi & Village Industries Commission has introduced scientific methods for flaying and carcass recovery of naturally fallen animals. The main objective of this programme is to create wealth from the dead animals which were either being buried or thrown to birds. This is being achieved as under:

- i) Studies indicate that from each dead animal, apart from skin, other products such as bone meal, meat meal and di-calcium phosphate, collectively worth about Rs. 500 to Rs. 600 can be obtained by scientific utilisation of the carcass. Programmes are being introduced to recover such products.
- ii) Second facet of the programme is tanning. Tanning is being developed by encouraging the establishment of modern tanneries in areas where large number of hides are available and where there is scope for introducing modern methods and equipment for tanning.

Besides, the Commission gives assistance to individual cobblers for constructing improved tanning pits in their houses. Both these schemes aim at producing hides of better quality.

- iii) Thirdly, the manufacture of footwear and other utility and fancy leather articles is encouraged by supplying modern machines, equipment and raw materials on easy terms. Training-cum-Production Centres are also established for training of cobblers on modern lines of production.
- iv) The fourth aspect of the programme takes care of marketing through the establishment of marketing depots in selected places where good potential for sales is indicative. The marketing depots generally work as purchasing and selling agencies for groups of production centres. These depots also help the production centres to obtain their essential raw materials at reasonable rates and ^{transport} / the finished products at fair prices.

Gaps in Technology and Suggestions

The gaps and suggestions for bridging such gaps in major areas of leather industry are discussed as under:

- 1) As per the present practice of preparing meat meal and bone meal the production cannot be sterilised and increased to the required level due to limitations of available equipment and high fuel consumption. Under ~~the~~ ^{the} conventional process flesh is separated from/bones by putting the product in a

Annexure 2 (contd.)

cauldron. After the separation, meat meal and bone meal are prepared separately. It is cumbersome, time consuming and expensive process involving high fuel consumption. Moreover, the present method does not help to produce bone ash which is in great demand in ceramic industry due to the fact that with the present equipment only half-burnt bones are produced.

Mechanisation needs to be introduced in the form of a suitable plant which could process meat and bones together continuously resulting in a final product of sterilised bone and meat meal. A temperature of 1200-1300°C needs to be reached to enable production of bone ash having needed porosity and thermal expansion. This needs introduction of a suitable kiln.

- ii) In the indigenous process of bag tanning, followed by the village tanners all over India, at a certain stage partly tanned hides are required to be stitched into bags for filling with tanning materials to complete the tanning process. Stitching involves a lot of labour and time and this is a limiting factor causing poor productivity of tanned leather. It is strenuous job for the artisans and in many cases it is found that the stitching is uneven and ineffective giving rise to leakage with the result that tanning of raw hides is not done uniformly and the quality is also affected considerably.

Introduction of a suitable machine or appliance to this job will help a lot for efficient production of bag tanned leather, improve the quality of the finished product and help increase ^{the} earnings of rural artisans.

Annexure 2 (contd.)

iii) With the conventional process of tanning prevalent in most parts of the country the quality of leather produced is not very good and the leather produced generally shows defects on the grain surface. This results in relatively lower price of finished product and also lower earnings of the artisans. There is no equipment available in the country at present to correct the surface defects.

Introduction of a suitable hot plating machine for giving the correct temperature and pressure on pigment film of grain surface would help eliminate the defects on the grain surface of leather. Such a machine may have a capacity of hardly 20-30 pieces of hides per day.

CANE AND BAMBOO INDUSTRY

Status of Industry

The bamboo goods which were once very common in households are not as widespread now. This is because manufacture of goods from bamboo is being handicapped because of ^{the} high cost of preparing splints, flats and other such parts for preparing utility articles. If proper machinery is developed and supply of such splints and flats are made available to the villagers, it will create additional activity at least for part-time occupation where the actual manufacture i.e. weaving or shaping of bamboo goods can take place.

Gaps in Technology

Due to problems associated with/^{the}production of splints, flats and other such parts there has been a general shrinking in the occupational and economic activities in the village life and there is great need to provide improved technology so as to make the rural artisans engaged in this industry earn a higher income than is usually available at present by their old techniques of manufacture. Development of proper machinery for splitting bamboo and also other local materials into proper sections and distribution of these sections to the village entrepreneurs to enable them prepare utility articles as per local needs is highly desirable.

Suggestions

Japan has developed suitable machines for this purpose. Some such machines have been imported and tried on the Indian bamboo and other raw materials but these machines have not proved to be highly successful due to different characteristics of the local raw materials. It is, therefore desirable to improve the design of the Indian equipment on the pattern of Japan's equipment/^{introducing} suitable modifications to make it suitable for use on local Indian raw materials.

POTTERY INDUSTRY

Status of Industry

The potters have been working with traditional equipment and tools which are not very efficient which has resulted in lower earning capacity of such rural artisans. The Government has, therefore, established research facilities such as/^{the}Central Training & Research Institute for Pottery

Annexure 2 (contd.)

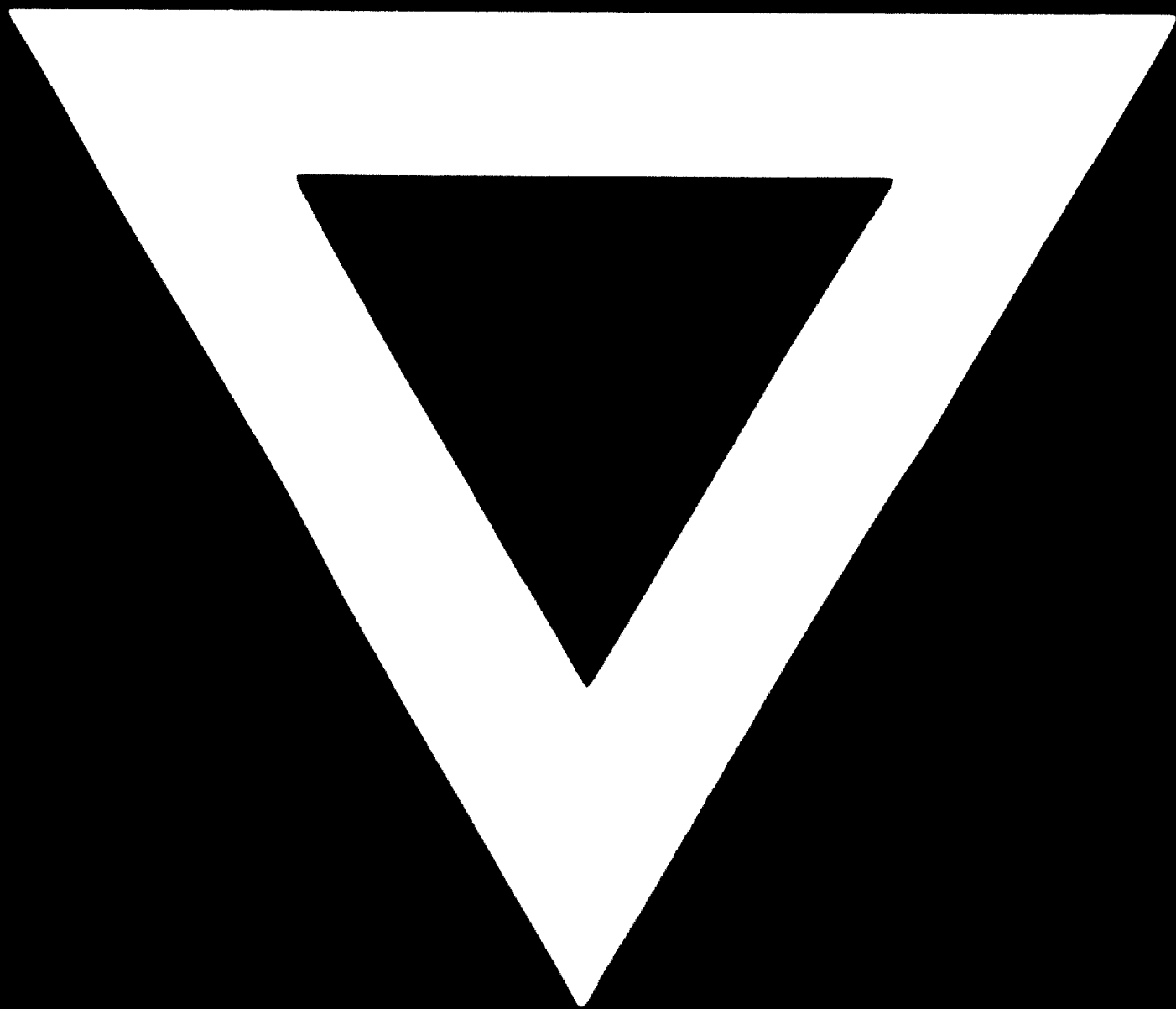
at Khanpur in Karnataka State, Central Research Institute for village industries at Sewagram, Wardha which undertake research and experiments in improving the skills and equipment of the potters. The Khadi & Village Industries Commission has also been organising potters to develop their skills to enable production of such articles which have expanding market. A variety of products ranging from functional potterywares to sophisticated articles and insulators are being produced through a number of co-operatives and registered institutions of potters.

Gaps in Technology and Introduction of Improvements

The Khadi & Village Industries Commission after having studied the problems of the industry has drawn up programmes for development of this industry on more scientific lines to improve productivity. The main features of the programme and innovations being introduced include:

- i) Introduction of potters' wheel in place of existing traditional wheels. The improved wheels are fitted with ball-bearings and are lighter to operate and these wheels have better speed than the traditional wheels. Unlike the traditional wheels, they do not wobble while rotating.
- ii) Introduction of better methods for cleaning clay and separating foreign materials from it before kneading and firing etc.
- iii) Introduction of improved kilns for reducing the consumption of fuel and improving the quality of products.
- iv) Encouragement to produce higher value products like bricks, tiles, grills and other decorative furnishing articles, popularisation of production of glazed pottery articles such as cups, saucers, jars, sanitary wares, pipes and basins, water channels, high and low tension insulators and artistic wares etc.

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