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

.....
**RURAL WORKSHOPS IN DEVELOPING COUNTRIES,
Background Paper.**

**RURAL WORKSHOPS IN
DEVELOPING COUNTRIES**

by

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SUMMARY OF OBSERVATIONS

Many developing countries of the world have diligently pursued a policy of industrialization as one of the prime means of economic development of their nations. Some others have recently launched upon vigorous plans of industrial development to improve their economies. Others are keenly planning a course of action, so that their countries can enter the process of industrialization.

Hitherto, developing countries have, by and large, adopted the pattern and structure of industrial development of the advanced countries, from whom they have largely acquired technology and know-how. As a result significant gains have been achieved by many countries through rapid industrialization. However, in spite of their impressive performance, invariably all of them face problems of unprecedented unemployment and poverty which have emerged as some of the most pressing political and social problems of the 'seventies'. Despite the promise that heavy industrialization of developing countries would spread benefits of economic growth among the urban rich and the village poor alike, the gap between the wealthy minority and the impoverished majority of the rural population has widened considerably.

Consequently some of the developing countries have awakened to this emerging danger and are seriously reviewing their industrial policy-frame in retrospection, to identify possible causes for this unfortunate occurrence, which has been vastly aggravated by the explosive growth of population in almost all the developing countries in the world.

One of the probable reasons for the grave unemployment and under-employment of the rural population which has over these years migrated in large numbers to urban areas in search of jobs and occupations, appears to be the adoption by developing countries of industrial technologies which may have been inappropriate to local conditions and environments. Some of the labour-saving technologies of the advanced countries

seemed to have been blindly copied, in spite of there being reliable opportunities of suitably modifying these, without sacrificing costs and quality of products to make them labour-intensive. In some cases, as in highly automated process technologies, it has been assumed that there could not be any possibility of introducing labour-intensive methods, at least in parts, without sacrificing costs and quality of the end product. Closer and more diligent investigations, however, might have revealed that there could have been considerable scope for employing a bit more manual labour, instead of employing the costly automated processes. It is not so much that one could derive substantial gains through such investigations, but the developing countries could have disciplined themselves to looking deeply into all that the advanced world has given them by way of technologies with the sincere desire to convert some of this to suit the local conditions and make it employment-oriented without loss of quality and increasing costs of production. The attitudes and approaches of production engineers and economists would thus have undergone changes for the betterment of the developing nations.

One of the important sectors of industry which possibly renders itself more easily to decentralization is the engineering and metal-working industry. It is in this area that many developing countries could explore possibilities of increasing the employment potentiality without sacrificing costs and quality of products and services.

So far their concentration has been in the direction of developing as many small-scale and rural industries as possible to decentralize their engineering production. Ancillary industries have also been set up around large scale industrial complexes to serve the parent industry by supplying simple components, assemblies, undertaking intermediate operations like rough machining, heat treatment, fettling and cleaning of castings, forging and sheet metal work and supplying accessories and other incidental engineering services, etc. Many developing countries, like India, have so far adopted the above means to decentralise the

production methods and provide scope for further employment.

Evidently, these methods have still not been adequate and the problem of unemployment and underemployment of the rural population has reached a critical stage, warranting exploration of further means of ameliorating the situation.

One of the ideas in this regard is the establishment of "Rural Workshops", which have the same objective of being highly employment-oriented operations, but with greater emphasis on providing work for the village population, not only to improve the rural craft skills and agricultural implements, tools, carpentry, smithy and so on, but to make the villagers self-reliant and the villages self-sufficient, so that their population does not indiscriminately and aimlessly migrate to urban areas in search of jobs to improve their standards of living. Hence, the idea of Rural Workshops should not be mixed with rural industry or small scale industry, though ultimately the Rural Workshops may transform themselves to that, without sacrificing one of the main objectives, i.e. the service function of repairing, maintaining and looking after the farm machinery, tools and engineering equipment, consumer durables and intermediate goods, used by the rural population.

The idea being new and to that extent almost innovative, may invoke considerable debate and this paper aims at just that, i.e. to kindle debate and closer investigation to justify the setting up of "Rural Workshops".

INTRODUCTION

Many developing countries in the world, in the determination to improve the economic conditions have resorted to industrialise their countries as quickly as possible. However, the pattern of industrial growth and the structure of industry adopted by them has largely followed the pattern and structure of the industrialised nations. In their enthusiastic pursuit of industrialization, the rural community seemed to have been somewhat neglected by them. Perhaps it was believed that substantial economic gains accruing out of industry could flow into the rural sector as the latter provided many of the basic industrial raw materials, like cotton and sugarcane. But this has not been largely the case and many developing economies are presently faced with the urgent and imperative need to improve the economic conditions and standards of living of their village community.

In this context some of the developing countries like India are even having a second thought in retrospection, if in the past their policies governing the industrial sector have been, at all correct. In any case they are frantically trying to identify as to what should be done to ameliorate the conditions of their rural population. In this connection one of the thoughts which has emerged recently is the establishment of "Rural Workshops" to provide the village community job opportunities in their own surroundings, instead of migrating to urban cities in pursuit of employment in industry. The exodus of village population to cities has assumed, in the case of many developing countries, a very serious proportion, causing innumerable social and ecological problems. Secondly it is thought that such workshops could provide facilities to farmers to repair and maintain some of their agricultural machinery and equipment, like farm-machinery, diesel engines, pumps and pumping sets, electric motors, tractors and simple farm implements. Further it is hoped that these workshops may improve the skills of village artisans through training and providing them with better tools and equipment. Spin-off benefits through linkage between the rural workshops and industry - small and large scale - situated in the vicinity have also been conceived.

However, it appears that one is not quite clear as to the outcome of establishing these workshops, since in this regard there is hardly any past experience available. Further we are also not quite clear as to how to go about the task of setting up of Rural Workshops to make the experiment a success. Even so, the countries who have come up with the idea, are quite keen to go ahead and even in their economic plans have provided adequate resources - financial and physical. But still, they too, seem to be toying with varieties of ideas and schemes. Thus the concept of Rural Workshops is in infancy stage and even in a bit of confusion.

The present study-paper on the subject, it is hoped, may serve as loud thinking, and certainly does not provide any concrete solution to the problem as to how to make the concept, if at all right, a success and enable it to contribute to improving the standards of living and quality of work and life of rural population of the developing countries.

The decentralization of industry may not always be possible. The nature of industry may be such, that if cost of production, quality of end-product and profitability have to be principal considerations - and in our opinion these should be - it may not be possible to farm out a substantial part of the work content to small and medium ancilliary industrial units. The engineering industry however is one which provides the maximum scope for decentralisation, keeping the costs, efficiency and profitability always as the main considerations. It is in relation to the engineering, particularly metal working industry, that the experiment of "Rural Workshops" could prove to be a success.

I. PRESENT SITUATION

The concept of Rural Workshops is not new, though the idea gets often mixed with rural and small scale industry. However, it is only recently that one has begun to hear about the emphasis in most developing countries on the need for establishing Rural Workshops. The idea is partly to modernise village craft and provide better tools and equipment to the village artisan to improve the efficiency of his operation and better the quality of products and services made available by the rural community. If one is to trace, the growth and development of industry in advanced countries, like, Japan, Switzerland and Germany, it is to be observed that most of their organized sector of industry made its beginning with Rural Workshops, which got enlarged, modernised and eventually took up production of a variety of industrial products, of most sophisticated types, over the centuries. Even today the industry in these countries is so widely dispersed that inspite of giant operations clustered around urban and metropolitan areas, there are multitudes of workshops in the rural areas which undertake among other things repair and maintenance jobs, and sometimes accept sub-contracting work from bigger industrial units in the neighbourhood.

Strangely enough the growth of industries in the developing countries on the other hand has taken place by and large in quite a different manner. The industries in these countries have been established mostly in a planned manner in large scale and have not given the due importance to the development of rural and small scale industries and workshops. More over there has been concentration of industries in urban areas, neglecting the rural side under the assumption, that the main pre-occupation of the villages should be agriculture and modern industries should be established mainly in the vicinity of markets and raw materials, and wherever educated labour and university trained engineers and technologists are available.

Perhaps this was necessary to speed up the process of industrialisation and heavily concentrated efforts had to be made to establish large industries to take advantage of economy of scale and cut short the normal development time it has taken the industrialized countries to establish their industries, making a beginning in small scale and enlarging the size in course of scores of years. More over it appears, that since most of the developing countries lacked the infrastructure - like skilled manpower, trained managerial personnel, water, electricity, power, modern housing, health and hygiene facilities, recreation and other needs of modern society, and most of these are either easily available or could be developed under urban surroundings within much less time than perhaps on the rural side, the governments and planners of industries of the developing countries have been preferring clustering of industries in and around cities and in the urban areas. Even when some of the large industries had been set up in the rural area, with the growth of population, imigration of villagers to the industrial areas, these localities grew up as modern self-contained colonies of urban sizes, benefits of which have rarely percolated to the deserted villages. The larger proportion of the village population has remained poor, and did not participate in the benefits of large scale modern industrial complex and enjoy its affluence.

Fundamentally there has been a high degree of self-sufficiency in industrial planning and establishment. Most certainly some of the heavy and high capital intensive industries may have to be established in the manner, where most of the work is done under one roof, and very little scope may exist for decentralization and distribution of work content among various units of small and medium scale, dispersed throughout the country. The very nature of the product or process may be such that apart from economy of scale, the production technology may not render itself into breaking up of the manufacturing components into different segments, thus making it possible for creating a number of smaller units of manageable sizes, and procuring simpler and less critical items and ancilliary equipment from rural workshops, small and even medium scale industrial units. But there could be - and definitely there is an array of possibilities in many areas where appropriate technology of production could serve the desired objective, i.e. a maximum dispersal giving scope of providing work and employment for small and rural workshops and ancilliary units.

Inappropriate technology could cause more problems than it solves. And in fact one of the causes for the backwardness, poverty, unemployment and deprivation of the rural community from participating in the industrial affluence and prosperity may be due to inappropriate technology that many of the developing countries would have adopted in industry. Even in respect of highly industrialized countries it has been recognized that high technology alone has not paved the way for a better future, though in the past massive infusions of high technology have been of incalculable benefit to the stupendous growth of the advanced nations of the world. Many of their key technological developments on which their economic prosperity was based took place in an era of cheap oil. Now the price of petroleum has increased five to six fold and many of the modern technologies dependent on it have become economically questionable. Further more ecological problems would constrain the use of other advanced technologies invented by the highly industrially advanced nations. In fact no technology is appropriate if its impact on humanity and nature cannot be sustained over the long term. In sum, if technological development is to be more compatible with human needs and more in harmony with the earth resources, the lasting impact of technology, on employment, equity, energy use and ecology must be weighed carefully.

Developing countries have been by and large adopted the pattern and structure of industrial development of the industrialized countries from whom they have acquired on a large scale technology and know-how. As a result, fairly rapid industrial progress has undoubtedly taken place in several developing countries and increasingly wide and diversified range of industrial goods and services is being produced. Further the results in terms of sectoral industrial growth have been quite significant in several developing countries, and a modern industrial sector has emerged in most of these countries.

In spite of such significant gains achieved by many developing countries through rapid industrialization, invariably all of them face the problem of unprecedented unemployment, which has emerged as one of the most pressing political and social problems of the seventies. Though this situation may not entirely be due to inappropriate technologies, emulated by the developing countries,

there appears to be a valid reason for a reappraisal of many of these technologies by the developing countries, with the view that they do not make similar mistakes of concentrating on improving the conditions of only some segments of their societies, and neglect other equally important and in fact very much larger proportions of their populations residing in villages. Despite the promise that heavy industrialization of developing countries would spread benefits of economic growth among urban rich and village poor alike, the gap between the wealthy minority and the impoverished majority has widened considerably. It is at this stage that we are trying to explore if Rural Workshops could provide some sort of a more appropriate means of industrializing the rural population and help the latter to actively participate and work as sub-contractors of the large and medium scale of industry in the developing countries.

II. OBJECTIVES

Trying to clearly identify some of the salient objectives of Rural Workshops, we may decide upon the following, as part of the overall aims of self-employment and self-reliance of the rural population:

1. To train the rural population in some of the essential engineering trades, and in the use of modern tools, simple machine tools and other mechanical equipment.
2. To equip rural artisans with knowledge of repair and maintenance of simple machinery employed by agriculturists in farming, e.g. tractors, pumps, diesel engines, electric motors.
3. To acquire modern skills in the manufacture of components, accessories and simple gadgets as jobbing work from organized sectors of industry.
4. To eventually transform the workshop capabilities and harness these to produce industrial products of simple designs. In other words, to transform them into small rural industries.

It is perhaps necessary to give some details to elaborate what the above objectives mean.

1. Most of the developing countries have directed their educational plans to include vocational training of boys and girls, after they finish their school education and before they enter the middle schools. Some of the training institutes cater for specific needs of the respective developing country, such as training in carpentry, smithy, spinning and weaving, handcraft, painting, printing and so on. When we are dealing with the Rural Workshops the relevant vocations are: turning, fitting and filing, milling, grinding, shaping, planing, welding, foundry, smithy and forge shop trades, carpentry, pattern-making, etc. Many developing countries like Ghana, Mexico, India, the Philippines, Indonesia and Sri Lanka, have set up numerous Industrial Training Institutes (ITIs) where training in the above and other engineering trades, teaching in shop-mathematics, workshop calculations and machine drawing are carried out.

However, training aims and objectives in the ITIs and similar vocational training institutes are that the trainees from these centres would form the source of recruitment by industry, to meet the needs of a skilled labour force. The idea of training for the Rural Workshops should, however, be one of a specialized type directed primarily to eventually absorb the trainees in the Rural Workshops after necessary training, and be able to produce goods and services earmarked for the Workshops, i.e. to repair and maintain the rural machinery, accept outside jobbing work from the organized sector of the metal-working and engineering industry and so on.

2. The second objective of the Rural Workshops could be elaborated by giving some concrete examples. In many villages of developing countries when some mechanical equipment or gadgets used by farmers go out of order, there are scarcely any facilities to repair these. For example, if a tractor fails, it is not an uncommon scene in the rural areas to see the agriculturists take the tractor by bullock cart to the nearest town to get it repaired. Similarly, when a diesel engine or centrifugal pump or electric pumping set etc., breaks down mechanics and service engineers from the suppliers rarely come down to the village to repair these, and it is quite common for the villagers, at the cost of heavy expenses and time, to take these equipments for repair to nearby cities.

Rural Workshops should try and remove these hardships on the part of the farmers by providing specialized services to repair some of this machinery. Machinery and equipment popularly used by the neighbouring rural communities should be repaired by the Rural Workshops, using the available machines and other workshop facilities, the engineering staff and workmen employed in these rural centres. Besides the Workshop staff should carry out periodical maintenance of rural machinery, on payment of reasonable charges.

3. The next objective of Rural Workshops should be to become competent sub-contractors of the organized metal-working and engineering industry. The Rural Workshops should serve as a supporting facility to be used by the large and medium scale manufacturing industry in and around the vicinity. The engineering and manufacturing skills of the Rural Workshops should be so augmented that these

Workshops become capable of producing simple components and accept rough machining of components, assembly of simpler units/groups, carry out heat treatment, fettling, sandblasting of castings like aluminium covers and blanks, sheet metal and welding work etc., at reasonable prices and in acceptable quality. Then there should be no difficulty for the Workshops to improve their finances, and besides becoming self-sufficient in their operation, they can expect to make reasonable profits. Experience has shown that any business, when highly subsidised by governments could exist up to a point, beyond which it cannot be a profitable operation, and there is always the danger of its liquidation. We believe, that the Rural Workshop is no exception.

4. The last objective is that the "Rural Workshop" graduates to become a "Rural Industry". In this capacity, the Rural Workshop should be in a position to produce simple industrial products like agricultural implements, centrifugal pumps, and even small diesel engines, based on designs either licensed by the organized industry or an adaptation of certain proven designs of industrial products.

When this happens, there is some danger that the Rural Workshops may ignore the basic objective of being service centres for the rural population. It should be possible for the Rural Workshops to undertake the production of certain industrial products for outright sale to markets and at the same time satisfactorily carry out the service functions of maintenance and repair of the machines and equipment employed by the village agriculturists. Also, in order to encourage the rural talent to find its equitable price-level in the open market, it is advisable that a certain proportion of the skilled labour, engineering personnel etc., are allowed to find appropriate positions in large and medium industry and business in the urban areas. It should be a continuous process for the Rural Workshops to train the village labour force, so that it may serve as feeding points of the large and organized engineering and metal working industry.

III MODEL RURAL WORKSHOPS

The size of a Rural Workshop may vary from one to another depending upon various factors like work content, regional requirements of a cluster of villages and the needs of the organized sector of industry in the vicinity. Yet for the purpose of estimating financial and other implications, it is possible to conceive of a 'model'. Assuming we have 100 rural trainees to be accommodated and no expansions are envisaged within say, the next 3 years, the total capital cost of a model centre is estimated at \$ 100,000 of which land, its development, building installations like water, electric power and roads and compounds should not cost more than \$ 25,000 and the plant machinery and equipment, the balance \$75,000. If there is any specialized requirement of a regional Workshop, it could then be run partially or fully in the second shift, before additional investment is to be made. If, on the other hand, there is a permanent work load for say 200 workers, then the total capital expenditure in a model centre may have to be doubled, i.e. \$ 200,000. However, to gain experience and explore further improvements as the scheme of establishing and running the Rural Workshop proceeds progressively, it is better to start on a modest scale as suggested, i.e. with a capital investment of \$ 100,000 per Workshop.

Some suggestions in regard to the main items of investments could be made. For instance, the village land could be made available free of cost. The costs of the development of land and the connecting roads with streetlighting etc., could be kept to a minimum, and as far as possible, existing facilities may be used. This aspect will be covered further in the Report, while discussing suitable locations for the Rural Workshops. The architectural design of the building should be simple and as far as possible mingle with the rural environment and present a picture in tune with the rural surroundings. Thus it should not be a costly affair. On no account should the buildings present an alien skyline. Since no cranes (overhead type) are required, the building itself should be of light construction and built as far as possible using village talents, artisans and building materials. Suitable hygienic

facilities should be incorporated and adequate and safe storage space should be provided. There is no need to provide residential quarters; although for essential staff like watch and ward, modestly-designed rooms could be provided. The staff members should preferably stay with the village community, but it may be necessary to grant additional finance whenever essential by village administrations to improve and modernise the accommodation provided for the staff and instructors. Water and electric power should be made available to the Workshop either by village administrations or the state/provincial governments, perhaps from out of the rural development funds.

The main cost component, however, is the plant machinery, auxiliary equipment and its installation. Here a careful consideration is necessary, and while the machinery should be modern, it should not be sophisticated. We should be able to buy the required plant and machinery and install it within \$ 75,000. It may be worthwhile here to club together the requirements of various Rural Workshops to be set up in the country and make combined purchases against reasonable discount, taking advantage of bulking of orders for different types of machine tools, electrical equipment and workshop tools. A centralised agency, preferably an autonomous body, (this aspect will be discussed in Chapter IV), charged with the responsibility of implementation of the scheme, could be entrusted with the task of purchasing plant and machinery for all the Rural Workshops in the country. This provides a better bargaining strength while negotiating with suppliers and may result in substantial saving.

Items of machinery and plant equipment could also vary from Workshop to Workshop, but it is possible to suggest a pattern, since there would be greater commonality in the types of machinery and equipment needed by the various workshops being established in the country. These could include:

<u>Number of Items required</u>	<u>Type of Equipment</u>
4	Centre lathes, 130/200 mm, 1,000/1,500 mm.
1	Turret lathe, 220 mm, centre height

(contd.)

<u>Number of Items required</u>	<u>Type of Equipment</u>
1	Capstan lathe, bar type, spindle bore, 63 mm. diameter.
1	Shaping machine, 500/650 mm. stroke
1	Grinding machine, universal type, 130 x 1,000 mm
1	Tool and cutter grinding machine
2	Kneetype Milling machines, size 2, one vertical, one universal
1	Hacksaw, 500 mm. diameter, bar-cutting capacity
1	Smithy with hammer (drop hammer)
1	Shear, 2,250 mm. length
1	'OBI' presses - 100 T capacity
1	Welding set
1	Salt bath for heat treatment
1	Annealing furnace (small size)
1	Crucible furnace (oil-fired) for non-ferrous castings
	Work benches with machine vices, files, cutting tools, milling cutters, drills, reamers, scrapers, etc.
	Other miscellaneous workshop equipment and tools.
<u>Strength</u>	
50	Machinists
50	Fitters/assemblers maintenance and repair mechanics

Summary of Capital Cost

\$ 25,000	Land and Buildings
\$ <u>75,000</u>	Plant and machinery and tools
\$ 100,000	Total cost

FOUNDRIES, TRAINING CENTRES AND TOOL ROOMS

Foundries: The cast-iron Foundry constitutes an important requirement in the concept of Rural Workshops. Certainly, it is not economical to set up a Foundry attached to each workshop, and there is also no need for this. What could best be done in this case, is to set up one foundry in a suitable rural area instead of the Workshop, to serve as supplier of castings to various Workshops. The cost of setting up a Foundry is

much less than the costs involved in setting up of machine shops, (Rural Workshops). Perhaps for the amount required for setting up two Workshops, three cast-iron Foundries could be set up. On the other hand, the number of Foundries needed to be established is less as compared to the requirements of the Rural Workshop. A fair estimate could probably be, that for every four Rural Workshop, two Rural Foundries may be set up.

Training Centres: Speaking of a Rural Training Centre, the investment should not be more than that for the Rural Workshop, i.e. \$ 100,000. The Training Centre could be planned and set up on a "modular" concept and cater for the needs of skilled workers for a number of Rural Workshops - say one Regional Training Centre between six Rural Workshops. The programme of training could be so planned and co-ordinated that in a period of nine months, 100 trainees could come from each of the Training Centres and provide the required skilled labour force for all the six Rural Workshops. Later, when the need for keeping all the Training Centres is found to be diminishing, some of these could be easily converted into Rural Workshops with marginal additions of investments.

Tool Rooms: The need for tool making for the Rural Workshops, as well as, perhaps, for the organized manufacturing and engineering industry, becomes greater as the productive activities in the Rural Workshops increase as compared to repair and maintenance and similar service functions. The cost of establishing a Tool Room is not appreciably more than the costs involved in setting up a Rural Workshop. Perhaps what will, however, happen is that the personnel strength of the Tool Room might be slightly less than that of the Rural Workshop, (2:3 proportion), though qualitatively the skills of the work-force employed in Tool Rooms are higher than those working in the Rural Workshops. As in the case of the Regional Rural Training Centres, Tool Rooms could be set up in rural areas on regional basis - one Tool Room for, say six Rural Workshops. The number, of course, depends upon the requirements of tooling, but generally, one Tool Room for six Rural Workshops appears to be reasonable. If ever the load on Tool Rooms should get reduced, these could also operate as Rural Workshops and undertake work of a type normally executed in the Rural Workshops.

IV. ORGANIZATION OF RURAL WORKSHOPS

Any operation, in spite of its laudable objectives and successful beginning, might end up in failure if its activities are not properly organized and administered. The Rural Workshop in this regard presents a challenging field, more particularly because of its location in rural surroundings and as stated, in the beginning it is almost a new and innovating idea. It must be acceptable to the rural population which is mostly uneducated and tradition-bound. Though in some developing countries, their villages have had a certain degree of exposure and modern impact of education. **Nevertheless, organising Rural Workshops in many developing countries will be a complex task.**

The question of establishing Rural Workshops, thus may need to be examined in relation to the stage of development of a particular country. It is possible, for this purpose to categorise developing countries into say two main groups. One group would perhaps consist of those developing countries who have made sufficient progress in industry and agriculture, and they are even on the verge of transforming their economies into more advanced ones, industrially. Yet due to various reasons, like the application of inappropriate technology to industry and agriculture and due to the explosive increase of their populations, they are required to find solutions to improve the living conditions of the teeming millions of their rural population (many of whom have migrated in large numbers, to crowd a few cities causing insoluble problems of congesting, poverty and ecology) and who are unemployed or underemployed.

The second group may consist of the least developed of the developing countries where there has been little impact in the agricultural and industrial areas and where the majority of the population live in widely-dispersed villages with limited educational and employment facilities.

Dealing with the first group of countries, there is also the question of the existing set up in government levels, which has been primarily concerned with development of small scale and village industries. For example, in India there is a large government department in the Ministry of Industry at the Centre in charge of these activities and headed by a top-government official, i.e. the Commissioner of Small Scale Industries. He has an extensive organization spread throughout the country to assist and administer the development of rural and small scale industries. For instance, there are Small Industries Service Institute (SISIs) in each principal city and urban town, who are charged with the tasks of training and guiding in all developmental aspects of small scale industry, including providing assistance in procuring of finance, raw materials, plant and machinery, import licenses, etc. In addition, each State has its own Industry Ministry and there are Commissioners and Directors of Industry, who are also in charge of similar functions and work in close collaboration with the organization of the Commissioner of Small Scale Industry of the Central Government. How the organization of Rural Workshops planned to be set up in 450 centres is to be co-ordinated with the existing set-up described above poses, in the case of India, yet another problem.

With regard to this problem, there cannot be any finality, particularly since the concept of Rural Workshops itself is quite new and no past experience exists in this direction. What will perhaps happen before we arrive at a fairly satisfactory organizational set-up for the network of Rural Workshops, is a lot of experimenting, trials and changes in the administration of Rural Workshops in each country.

That the whole exercise has to be largely financed by the respective countries' governments goes without saying. Since substantial financial support is thus derived from the governments at both the centre and state levels, it is also understandable that the authorities in charge of

Rural Workshops are responsible to governments at different levels. But there is sufficient experience to prove that government departmental controls are not always conducive to management of developmental activities of the type of Rural Workshops and in fact in the whole labyrinth of bureaucratic, political and economic facets of governmental systems, it is possible that the whole concept may turn out to become one of rule-bound, slow-moving activity, and does not get sold to the rural population. After all, one has to sell this idea to the rural people for whose benefit the scheme of Rural Workshops is being considered.

One of the suggestions to get over the difficulties could be that a separate and autonomous, fully empowered powerful Board or a Corporation be set up and charged with the task of developing the Rural Workshops. The Board should be kept out of bureaucratic and political influences and be managed by professionals of proven integrity, merits, and accepted by the public and the rural population. The members on the Board should be drawn from the large scale (at top level management) and small scale industry and Financial Institutes, participating in the scheme in different states and regions and headed by a business-oriented Chairman and Chief Executive. For ease of administration, the main Board could additionally set up requisite number of Sub-Boards, to whom the day-to-day responsibilities of running the Rural Workshops in a particular region should be entrusted. The Board, in consultation with the Ministry of Industry may establish policy guidelines and work out details of organizational structure for the Rural Workshops. The appointment of managerial, technical and administrative staff and their service conditions, salary/wage scales etc., should be left to the main Board. Once the broad policies have been accepted by the Ministry, apart from accountability for the finances provided by the governments and the overall efficient performance of the scheme, there should not be any further controls exercised by governments in the operation of Rural Workshops. The Central Board and its regional Sub-Boards could in due

course evolve working arrangements and performance assessment procedures. It is advisable that at the Sub-Board level, representatives of the rural population in the region, be appointed. The Central Board should have on it as ex-officio member the Commissioner of Small Scale Industry with whose organizational help and guidance, suitable co-ordination and adequate co-operation between the organization of Rural Workshops and Small Scale Industry, could be established. As more and more experience is gained certain changes for the benefit of both organizations should be made in the co-ordinating mechanism.

In the case of less developed countries, it appears that the entire administration of the Rural Workshop scheme should be the responsibility of the country's government and its Ministry in charge of industry. Here, the equivalent of a Commissioner of Small Scale Industry could be in overall charge of the scheme and its operations and be accountable to the government for the efficient performance of the various Rural Workshops. His department will have to evolve the administrative process, whereby the Department of Small Scale Industry and the organization of the Rural Workshop should work together with common aims and objectives, not only of industrializing the rural population, but of providing gainful employment for the village youths. With years of experience in the administration of Rural Workshops, the organizational pattern suggested above for the first group of developing countries, namely the concept of an autonomous Central Board, should be adopted in the case of the less developed countries as well.

V. RELATIONS BETWEEN THE ORGANIZED SECTOR OF THE ENGINEERING
INDUSTRY AND RURAL WORKSHOPS

A close relationship between the Rural Workshops and the organized sector of industry, particularly the engineering and metal-working industry is of great importance, perhaps for the very survival of the Rural Workshops. Without substantial and effective participation of industry in utilizing the facilities created by Rural Workshops, the latter may not become viable in the long run. It may be possible for the governments to step in in the initial stages to finance additionally the working capital and even losses which may result from the operation of various Rural Workshops. But in the long run, the experiment will fail if the governments are called upon continuously to provide the Workshops with part of the working capital and bear the loss. It is possible for the governments to pass legislation, treating all this as social costs, to force the organized sector of industry to partly bear the cost of running the Rural Workshops and invariably load them with work to make them economically successful operations. But in a democratic economy this will not always work. In fact, it is not desirable that governments should use this means at all. What is required in the circumstances is that the Workshops must operate efficiently and, as any business activity, sell their available capacity profitably and prove to the organized sector that it is in the latter's interest and even worthwhile to off-load their work on the Rural Workshops. This is one method of making the Rural Workshops efficient and run them in a business-like manner to earn profits. This will surely enhance their growth and activities and enable governments to set up more workshops if necessary, to provide more and more employment potentiality for the rural population.

Another solution appears to be that the organized sector of industry should be given financial and fiscal incentives to 'adopt' the Rural Workshops in their region and even supervise the running of these themselves as extension centres to their main operations on behalf

of the Board. By doing so they not only increase their turnover, without much investment, but also gain by reducing their cost of manufacture, as the overheads of these Rural Workshops could be much lower than those of their own factories. If they are to administer these Workshops, they will have sufficient say in matters like selection of plant and machinery to suit the type of work they have planned to off-load on the Workshops, selection of staff and managers and even the rural workmen, and in the fixing of salary and wage scales and emoluments for the personnel working in the centres. The growth and development of new rural workshops will then be greatly facilitated. Moreover, the spin-off benefit would be that with industry taking the responsibility for the efficient running of the Rural Workshops, the latter will not suffer from any untoward interference of agencies outside industry and the central Board of Management. If the Rural Workshops are to be run on behalf of the Board by the industry, there could also be more flexibility in the selection of products manufactured and services rendered by the Workshops. Since running industry in an efficient manner to make profits is the principal aim of industry, one cannot see much difficulty in industry managing the Rural Workshops in an efficient manner to enable them to earn reasonable profits.

In any case, it appears that organized industry, both in the private and public sectors, should realize that it has some social obligations and responsibility to improve the living conditions of the rural population in their respective vicinity, as much as it is the concern of the countries' governments to provide employment for all, more so for the weaker sections of the community, for instance the villagers. It is, however, realized that voluntary acceptance of this as a national cause, may ease the burden on governments and save them from bringing in statutory compulsions on industry to do so.

VI. NUMBER AND LOCATIONS OF RURAL WORKSHOPS

Rural Workshops could fall into three categories - Machine Shops, Foundry and Tool Rooms and further we have included specialised Training Centres designed for the training of skilled manpower for the Rural Workshops. As the experiment is new it may be advisable at the start to set up a few pilot centres in rural localities which are nearer the organized engineering and metal-working industries. If the endeavour proves successful, some more Rural Workshops on similar lines could be established. If the experiment is proved to be successful, it could then be possible to cover the entire country.

For selecting the number and locations for Rural Workshops, we may consider a focal point in a cluster of villages in the neighbourhood vicinity from where all labour and other available infrastructure facilities should be drawn. It is not necessary that each village should have its own Workshop. In fact in India it is noted that 450 Rural Workshops are to be set up to serve 576,000 villages in the country.

Each Training Centre should be located in the rural localities nearest to the group of Machine Shops it is expected to serve. Similarly, Training Centres designed for training of skilled personnel for Foundries and Patternshops should, as far as possible, be set up in the vicinity of the Foundries. The same applies to Heat Treatment Shops, if it is decided to set up these as separate facilities. It is understood that Heat Treatment Shops should be located as near as possible to a group of Machine Shops.

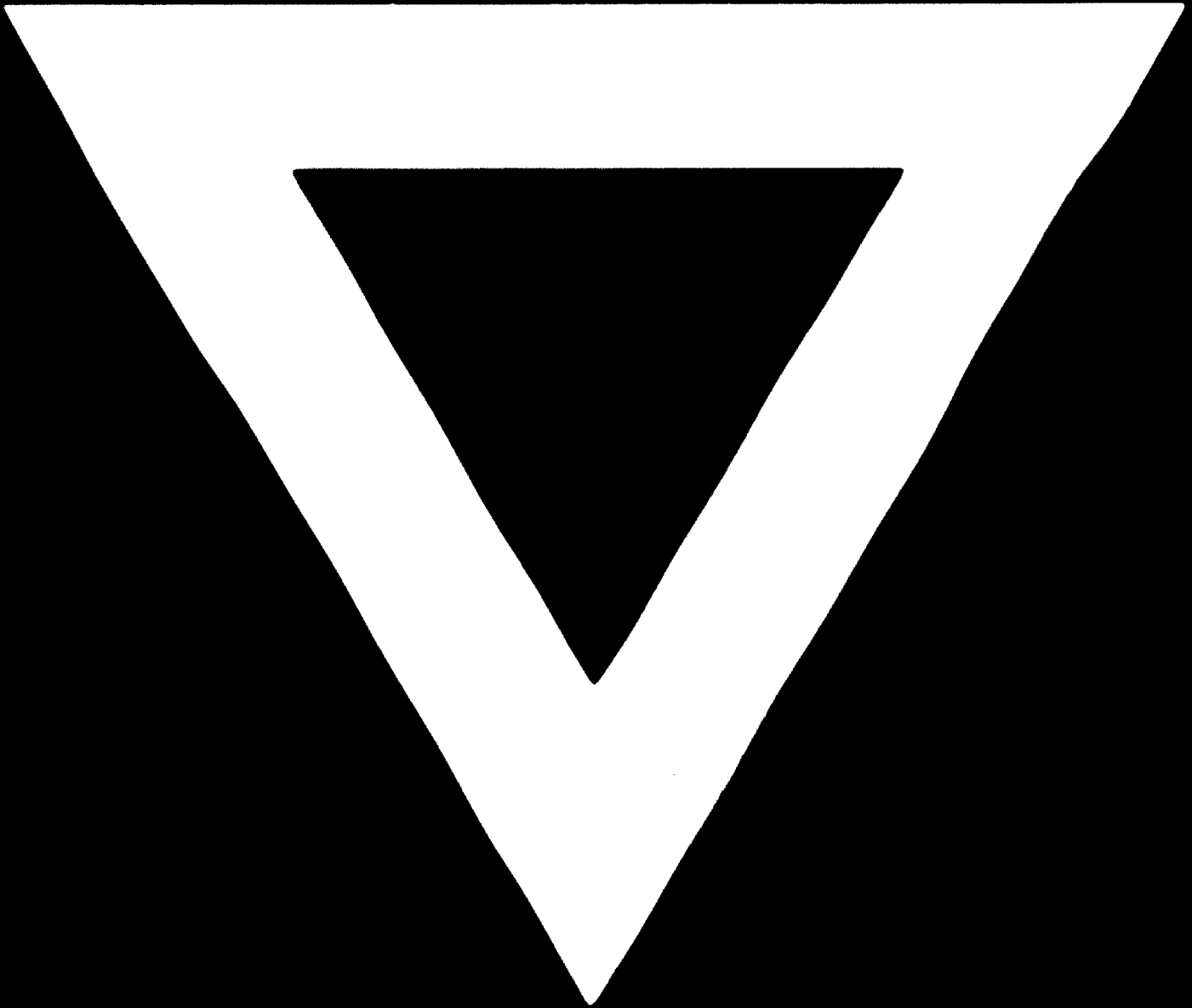
CONCLUSION

It can be seen that the concept of Rural Workshops to be set up in a planned manner is a new idea. The objectives are clear: to provide employment potentiality for the rural population in their own villages or nearby, so that the excessive migration of population that has taken place so far from the villages to cities is arrested. In fact, the flow should now be in the reverse direction if one is to avoid congestion in cities and urban towns and minimise the dilaterious effects of such congestion to human life. Besides, by improving the skills of the rural population to repair and maintain their farm machines, equipment, irrigation machinery and so on, villagers could become more and more self-reliant. The gains to industry through the utilization of capacity created in these Rural Workshops could result in increased production and profitability.

For achieving these and many other intangible benefits that may accrue from establishing the Rural Workshops, the developing countries may consider including the scheme in their Economic Plans and give it high priority. It is for the governments and the organized sector of industry to jointly see that the experiment becomes successful, as otherwise perhaps one of the means of improving the living standards and quality of life of our villages could possibly be lost.



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