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# Village Home Industrialization : The Yanmar's Case

—Feasibility in Bangladesh—

*Syed Maqbool Murtuza*

The study attempts at exploring the feasibility of rural cottage industrialization as a potential for augmenting income in rural areas and absorbing the vast unemployed labour force in Bangladesh for some economic contribution. The Yanmar Village Home Industry (VHI) drew our attention as a large scale and modern industry that relates to cottage industry, and where the system works while allowing the villagers to keep to their traditional employments of farming and fishing. Our investigation leads to the conclusion that such venture in cottage industry is possible with proper guidance and simplification of jobs to suit the rural populace who are not trained in modern technology. But this type of industry is time limited. At a stage of economy when the country is developing, wages are low and there is demand for labour intensive industries to absorb surplus labour, such cottage industry manufacture is welcomed and works economically. But for adaptation in Bangladesh, unlike Japan, planning with a modified model together with active governmental involvement and guidance may become necessary.

## **Introduction :**

The chief aim of this study is to look at the functioning of village home industrialization—at Ishimichi and Sugaura—initiated with active support and guiding sponsorship of Yanmar Diesel<sup>1)</sup>. The two villages are located at the north-west of Shiga Prefecture<sup>2)</sup>. Several households here are engaged part-time in manufacture<sup>3)</sup> of

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small engine parts for Yanmar Diesel Engine Co., Ltd.,—a large-scale industry manufacturing diesel engines and parts in Japan. We are concerned, at that, in exploring the feasibility of rural cottage industrialization as a potential for generating income and employment in rural areas of less developed countries—e. g., in Bangladesh—and thus supplementing the income of rural populace and relieving their chronic poverty. This hopefully may lead to uplifting the living conditions of rural mass and work as a counter force against unplanned flocking of rural people, in desperate search for work, to already over-crowding urban areas and live in miserable condition at slums in shanty houses. Besides, rural cottage industrialization may also help in integrating industrialization and industrial production to the general mass instead of creating merely 'industrial pocket-holes'<sup>4)</sup> in a setting of predominantly uncommittal and uninvolved rural milieu.

### **Propose :**

The Yanmar village home industrialization drew our special attention because of the close relationship between large scale industry and cottage industrialization. It concerns with how the system works—what the villagers manufacture and how, what the linkages are between Yanmar and home industries, how quality and production fluctuations are controlled, what the incentives are for a large industry like Yanmar to bring part of their production line to cottage industry, etc.,—as well as the role of such industrialization in village employment and income augmentation.

Secondly, production of small diesel engines are related to their extensive use in mechanization of agriculture, fisheries, transport and construction. These are areas of prime importance to the people concerned with development, and as such are drawing higher priority in LDC like Bangladesh where 80% of people live in rural

areas, depend upon agriculture or agriculture related jobs, and work mostly in 'pre-modern' work methods using manual and animal labour<sup>5)</sup>. Mechanization permits for increasing labour productivity by shortening time consumption and making production less susceptible to the whims of nature.

Third, such industrialization generates activity and mobility and adds to tertiary employment opportunities—services and repair industries, and increased business activities—that may well absorb large part of unemployed labour forces<sup>6)</sup> into productive contribution in the economy of the country.

### **Methodology and Limitations:**

This paper is based on direct personal observation and secondary data. In April, 1979, visits were made to Ishimachi and Sugaura Village Home Industries (VHI) as well as Kinomoto Tractor Assembly Plant and Nagahara Precision Machinery Plant. The working process was observed. Interviews were made and questions were asked. People every where responded favourably, since utmost efforts were made at the planning stage to intimate the people-in-the-field on our objectives of study and get their best co-oderation.

On returning to Tokyo, after initial data collection, several brain-storming sessions were held among the members of GA-80 at the Japan Center for Area Development Research (JCADR) with whose generous help the study was undertaken. Discussions were held among the members with their own perspective and observation of VHI system. This led to deeper insight and sharpening the tools of analysis.

All secondary data—lacking among those collected at the planning stage—were further collected by making a special visit to Kinomoto and West Asai town offices and the Yanmar office<sup>7)</sup>.

Lack of time did not allow us to make further sophisticated study of VHI system and collect necessary data by direct interview

of the villagers. Nevertheless, we hope, the paper will furnish some insight into the functioning of the VHI system in Ishimichi and Sugaura and instigate some thought on the part of the reader on applicability of the system elsewhere. It needs mention in passing that obviously it is too early to foretell the success of VHI system in obtaining desired results. Any application of the system should first be limited to testing before adoption. Besides, the variety in situation while applying the system elsewhere demands alterations and adjustments (as we will see later) to make the system fit into the milieu and make it operate functionally as a self-evolving system.

#### **A Brief Historical Account:**

“Ishimichi Village, once a poor Agricultural village, is now full of life, with industrialization. This agricultural village home industry is based on Swiss ideal of industrialization. These home industries are fostered with the goal of bringing industrialization to agricultural villages and increasing the economy of farm households. Ishimichi village was geographically handicapped place isolated from industrialization before, but since small factories were built to manufacture engine parts for Yanmar Diesel Engine Co, Ltd., the once poor village has experienced remarkable development through the ardent efforts of villagers, and envied by surrounding villages”.<sup>8)</sup> Now let us look into how the VHI stated in Ishimichi and Sugaura.

#### **Village Ishimichi:**

Located at the north of lake Biwa near border of Shiga and Gifu Prefectures, Ishimichi is a small hamlet of 183 persons living in 58 household families<sup>9)</sup>. Generally people along the shores of Lake Biwa are favoured with abundant fresh water fish and shell fish, and pisciculture is fairly common. However, Kinomoto dis-

tract<sup>10)</sup>, where village Ishimichi lies, is rather inland and does not have much access to the resources. Ishimich is primarily an agricultural village. Most of the households are engaged in farming<sup>11)</sup>. Since it lies in typical snowy province, life was not easy in the past. A report on Ishimichi says: "the average cultivated acreage per family is less than 0.7 acres, far behind the national average of 2 acres; ...the average agricultural income per household in 1958 was 40% of the national average. ...Forestry was the only way for people to make living. In fact, they were making a poor living by charcoal making. However, they cut all the trees thoughtlessly during the war-time and most of the mountains became bald after the war. Obviously, the life there became more difficult than before."<sup>12)</sup> It was in this situation that in 1951 some villagers approached Mr. Yamaoka Magoichi<sup>13)</sup>, the founder of Yanmar Diesel, for a village factory in their village. Mr. Yamaoka, who came from the same district and cherished the dream of rural industrialization in the Swiss model, accepted their petition. Construction started and soon twenty household workshops were constructed on pieces of land adjacent to their respective houses offered by willing families. By November 1952 the workshops started running. But as the electric company hesitated to lay power transmission line to such a remote village, a diesel dynamo of Yanmar Diesel Co., was installed in the village to power the workshops. This power house was later developed as village sub-factory and headquarter for household workshops. Soon number of participants increased and by 1954 there were already 57 machines operating in the village with 40 persons working. They included both males and females ranging from 20 to 70 years in age. A Yanmar report on VHI mentions, "...housewives in casual clothes, young girls, or old men with glasses are working hard with milling machines and cutting steels." As a matter of fact, any member in the family could contribute to the work. The village surplus labour was effectively

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engaged in economic productivity. Their income varied depending on output, since payment is made on piece-meal work system. At present there are only 20 persons working under the project. Most of them are under the older age group ranging roughly between 40 to above 70.

### **Village Sugaura :**

Not far from Ishimichi to the west in Nishi Asai district<sup>14)</sup> lies the small village Sugaura on a thin stretch of land on the bank of Lake Biwa. Like Ishimich, it also has high hills at the back. Inland access to the place was difficult in olden times. But now the village is well connected with beautiful paved roads on both sides. There is little farm land inside the village. Only some vegetables and fruits are grown on small backyard spaces. Contrasting to Ishimichi, the village gives a feeling of conjunction and scarcity of land. Houses are built closely. At present Sugaura has a population of 363 persons (175 males and 188 females) living in 102 household families<sup>15)</sup>. Unlike Ishimich, Sugaura is mainly a fishing village. Small fishing boats powered with Yanmar Diesel engines are anchored at the small harbour in the village. Life is busy in Sugaura from early dawn till late morning; because the fishing boats go out in morning darkness and come back with their haul that are soon sold to the dealers from the cities at the harbour. Of late, the village has started attracting vacationeers from cities during summer who come there lured by beautiful lake water and the calm life of the village. Offering home-stay facilities some families earn extra income. But only about twenty years ago life was not easy there. With the motive of supplanting the meager income of the villagers, the Yanmar Home Industry was introduced in Sugaura in 1961. Initially 50 persons had applied for work, but not all of them joined on commencement<sup>16)</sup>. Presently 34 persons (the number not changing much since the start) are working

under the program. Among them only five are men, while others are housewives and elderly women. Several of them work at the village sub-factory. Mainly due to shortage of land space, not all of the participants could get household workshops at their homes.

### **The Operational Process of VHI:**

Before examining the operational process of Yanmar Village Home Industry we need first to enquire the problems faced in adopting and operating the system. This is important, since we aim at exploring feasibility of such village cottage industrialization in LDCs. Problems are classified, for purpose of clarity, into several broader factors. Secondary, measures taken to overcome the problems (which we shall refer here as 'Filters to adopt VHI') as well as the results attempted or achieved are investigated and summerised (Table 1).

In both Ishimichi and Sugaura, besides the household workshops, a village sub-factory in each village, mentioned earlier, was made to serve as headquarter for household workshops. The sub-factory in Ishimichi, had also served as village electric power-house for electrification of the workshops there. But since after general electrification of the village the power generating dynamo of Yanmar, although workable, is lying idle. The sub-factory in the village functions as a center for distributing, controlling and supervising jobs. Besides, willing villagers, in both Ishimichi and Sugaura, who do not own household workshops work at the sub-factory workshops.

A supervisor assigned from the parent factory<sup>17)</sup> is stationed in in each village. He is responsible for getting the job done, checking the quality, distributing job, recording output, and work as liaison between the parent factory and the household workshops. In short, he works similar to a foreman in larger plants, but with more latitude and leadership. He works on fixed time schedule



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Table 1. The Adoption of VHI: Problems, Measures and Results

Factors	Problems in Adoption	Filters to Adopt VHI	Results
Geo-graphic	Distance from Parent Factory	Transport arrangement from Yanmar	Work at villagers' door-step
	Absence of Electricity in village	Village power-house constructed	Electrical operation of workshops
Economic & Labour	Inability of villagers to buy workshop, tools	Lease from Yanmar	Household workshops installed
	Seasonal fluctuations in labour	Work planning at parent factory	Regularity in production
	Increased participation of villagers	Latitude on who work in family	Tapping of unused labour resources
	Work routine suitable for working villagers	Latitude in working time and hours	Keep to production schedule
	Job completion of individual worker	Periodic work allocation and check	Eliminating production hold-up
	Payment system	Piece-meal work system	Optimum out-put
Technical & Skill	Overhead expences of running and maintaining machines	From parent factory	Easy work situation for villagers
	Lack of knowledge of villagers on machine	Training at Yanmar	Villagers operate and maintain machine
	Quality control of villagers on machine	Supervisor from parent factory	Less damages of goods and machine
Motiva-tional	Repair of breakage and fittings	Skilled mechanic from Yanmar	Steady production
	Confirming villagers' commitment to VHI	Participants offer land for workshop	Deeper sense of involvement
	Slackness in output	Posting of Supervisor in village	Follow-up and feedback
	Boosting Yanmar image in the community	Sharing in village welfare and community events	Inject sense of pride in VHI
	Job accident	Encouraging workers to enter insurance programmes	Minimum loss to Yanmar

like any ordinary worker in the factory<sup>18)</sup>.

All workers may possibly be categorized as semi-skilled. They do mostly simple works like bolt or some similar parts making. But at start, this was also not easy for a village worker who had never seen the machines before<sup>19)</sup>. The villagers were sent to parent factory to be trained in milling or drilling, and also to learn such basic industrial knowledge as the efficiency of machinery, the factory sanitation, etc.<sup>20)</sup> The workers at household workshops are not required to read engineering drawing. Typical operation requires load, drill, turn, cut-off and category. At the beginning lack of skill of the workers produced many inferior goods. To solve these problems, Yanmar gave adequate guidance to the workers, and such guidance was readily accepted by diligent villagers<sup>21)</sup>. Comparing to farming village Ishimichi, workers in Sugaura adjusted faster to machinery as they were already exposed to machines to some extent in their daily life operating motors of their small fishing boats. The initial conditions improved greatly and soon the villagers were running household workshops smoothly<sup>22)</sup>. It needs mention in passing that in all these years of operation only one occupational accident occurred in the village<sup>23)</sup>.

The workers appear to enjoy their work. They have the option of working when they like, and stopping when they like, as the machines are adjacent to their houses. In addition to the regular workers, any member of the family can work in the workshop when necessary. This facilitates increased participation and absorb surplus or untaped labour in the family for economic contribution. As a matter of fact, in both villages even the old age men and women, who usually cannot work any more in outdoor hard working jobs, are engaged in production and are proud of still being contributive to the society<sup>24)</sup>.

Materials and tools are carried from the parent factory and finished goods are sent back every day. Every workshop is equipped

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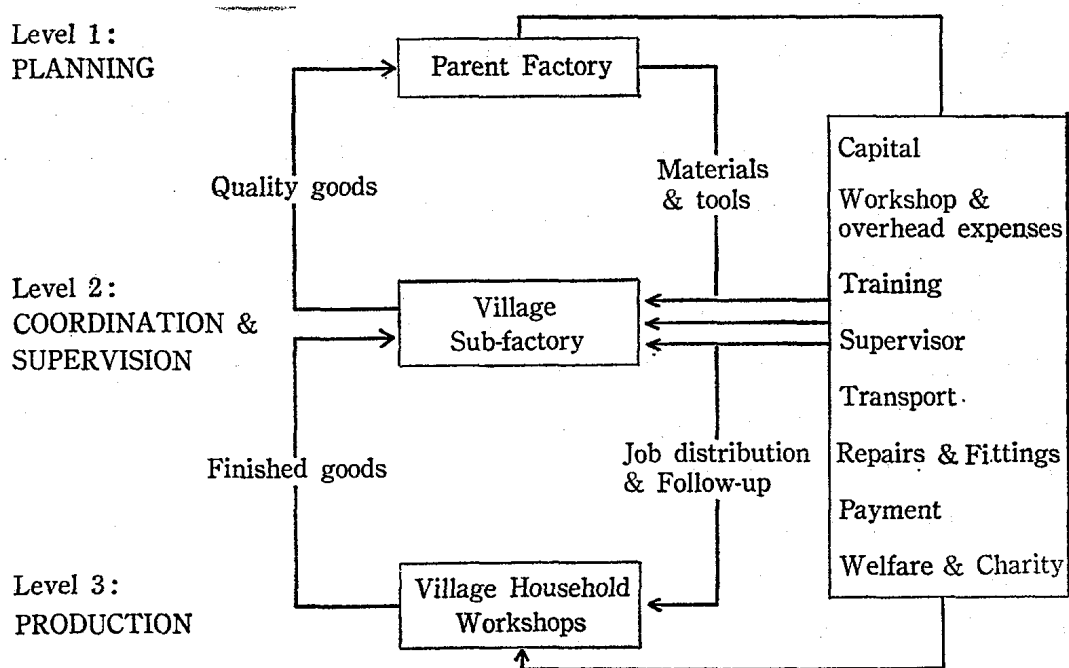


Figure 1. The Functioning of VHI system

with two units of lathe, milling machine and drilling machine. Each worker generally manufacture only one type of part, so that he can make the product more effectively and precisely. Close proximity of household workshops save workers time and money for commutation. Yanmar VHI thus operates on a three-tier system, where the sub-factory in the village performs an important role in coordination and supervision (Figure 1).

### VHI in the Present Context:

It should be remembered that Village Home Industry program of Yanmar was started with the motive of economic uplifting of the villages as well as a profit making operation for the company. The Yanmar report mentions: "Thus the home industry in an agricultural village which started to rescue the village from poverty has now developed to a great industry which brings profit to the people and to the company"<sup>25</sup>. And again, "Ishimichi village

became gradually rich since the start of home industry. In 1966 the village earned about ten million yen more than before.... They enlarged and rebuilt their houses. They recovered trees on the mountains, they started to lead happy jolly life."

But today we are doubtful of the profitability of this scale of operation. At this advanced stage of economy in Japan perhaps one automatic turret lathe installed in the Yanmar factory could have replaced all the lathes in the villages and thereby eliminated the cumbersome manufacturing process and the concomitant expenses for keeping the system alive. The cost of transportation, of keeping a Supervisor in the village, and of doing time to time charitable work in the village, should basically come from the operation.

However, we may well take into consideration that the machines at the village workshops has probably been depreciated to its scrap value years ago. Besides, the operators are not employees of the company. This means that the question of overtime, vacation, pension, welfare services and other fringe benefits extended to an employee as a general practice in Japan do not arise. So the cost of running the operation would be minimal.

Also, Yanmar has least fear that the production be held up. Because, if a worker of a household workshop in the village cannot work on a particular day for some reason, another member of his family takes over and completes the quota. Besides, the functional system of underletting work to sub-contracting firms, which is highly developed and very effective in Japan, also aids much in the continuity of VHI program. In an emergency or sporadic demand the company, without putting much pressure on the production of household workshops, can comply well by relying on these firms.

At a glance, the Yanmar VHI system is barely breaking even today. However, it need hardly be said that even if the program is running at a loss, the company has no alternative but to continue

the operation until it is not too adverse, because its stoppage would result in a tremendous loss of prestige in the locality and outside. Since its start Yanmar VHI has attracted lot of visitors. "Thick autograph albums of the visitors record various names of visitors—royal families, high officials, ministers, scholars, etc., Japanese and foreigners"<sup>25</sup>). Further, the management at Yanmar—committed to the ideology of the founding President late Mr. Yamaoka—are highly motivated to keep his cherished dream and ideal alive.

But today Yanmar is facing a new problem. As reported by the Supervisors, the workers are getting old, and there is lack of young and fresh work force joining the program. The latest addition had been already several years ago. To look into the reasons for this, we must first consider changes in the society. With the improvement in transportation and achievement of economic level where the villagers can easily maintain private cars, it has become easier for them to increase their radius of operation much farther. Today it is not uncommon that a villager drives a couple of miles to the city, works there and comes back to his home in village in the evening. Added to this, we cannot deny a growing reluctance to engage long hours in labour intensive works that seems apparent everywhere over time.

Besides, the Yanmar VHI program was started with motive of augmenting income of the villages by providing them job in their additional time<sup>26</sup>). To a career seeking young, engagement in VHI does not seem attractive, since it offers little prospects for rising up on the ladder. With opportunities of high education and increased abilities as well as availability of jobs outside, it seems unlikely that Yanmar VHI will get young workers. But since there will always be older people unengaged outside but remaining idle in the family, and those who choose to pursue the family occupation of farming and fishing, we can safely assume that Yanmar will get substituting work force.

This type of operation, thus appears to be time limited. For a certain stage, when the country is developing, wages are low and there is demand for labour intensive industries to absorb surplus labour, we may say, a program like Yanmar's is widely welcomed and accepted. But when the economy is advanced, wages are high, and stabilization of life style and income achieved, it loses charm and turns to be a liability. Even the people at Yanmar could not say how long they would be able to continue the program. This is obviously because the link is unclear between VHI and Economy (Figure 2).

#### **Existing Cottage Industry in Bangladesh:**

Cottage industry in Bangladesh generally indicate the "industries which are run in home, usually with the help of members of family". The Planning Commission has defined small cottage industries as "the industries which employ manual labour but do not use motive power"<sup>28)</sup> and outlined the governing principles for promotional programs of cottage industries as:

1. To create additional employment opportunities.
2. To encourage processing of indigenous raw material and specialization.
3. To encourage the growth of cottage industries in rural areas generally, and in particular wherever resources and markets are available.
4. To adapt these industries to changing technological, economic and social condition.
5. To modernize existing units as to have sound economic prospects.
6. To stimulate production of impliments and equipments required for agriculture and others.
7. To preserve and promote traditional arts and crafts.

Cottage industries in Bangladesh can be devided into rural and

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urban. In rural areas these are closely allied to agriculture, and include poultry-keeping, bee-keeping, seri-culture, rice-husking, 'Gur' (black sugar) making and others. It is estimated that about 3 million people are engaged in rural cottage industries. In urban areas the main industries include handicrafts like, cane-work, embroidery and ornaments, jute-crafts, tanning and manufacture of leather goods, musical instruments, brass and glass work, etc. About 1.8 million persons are estimated to be engaged in these industries.<sup>29)</sup>

Of all, the most important cottage industry in Bangladesh is hand-loom industry. It alone employs about 400,000 persons. Untill 1954 it had been meeting larger part of country's requirements of clothes.<sup>30)</sup>

The conditions of cottage industry in the country is a far cry from satisfactory. Capital investment is negligible and consists of mainly simple impliments. These impliments are old and traditional, with work technology going back to antiquity. In most cases they are worn out. The immediate need is short-term credit, research and guidance for improvement. This shall require a constant effort for improving and modernizing work technology, improving marketing facilities, introducing new designs and creative ideas for merchandise, and improving the quality of products.

As might be apparent, a distinguishing feature of existing cottage industry in Bangladesh is that the artisans and workers do not undergo proper training and education for the purpose. They acquire the skill through years of home apprenticeship or self learning, and naturally, they work simply in the way their grand fathers and great grand fathers used to work, having little improvement in the work methods. They have not been exposed to new ideas and technologies. This makes their work unrefined and lacking in imagination and design that may appeal the modern market.

### **Adaptation of VHI in Bangladesh :**

Bangladesh is economically under-developed and characterized by predominance of agriculture and subsistent production. Approximately 60% of GDP is from agricultural sector which absorbs more than 75% of labour force.<sup>31)</sup> Economic development for Bangladesh means not only development of manufacturing industry but also improving vast and inefficient agricultural sector. Since with one of the highest population density in the world (estimated now at more than 1500 persons per square mile),<sup>32)</sup> the agriculture sector is already over-crowded with unproductive idle labour force. Average farm size in 1968 is estimated to be 2.59 acres for an average rural family size of 5.69 persons.<sup>33)</sup> With increase of population since then the farm size must have decreased drastically.

There is no denying that industrialization through rural base, as in Yanmar's VHI, is a helpful resort to keep economic development in momentum by utilizing effectively idle rural labour. The pursuit of modern industry with rural living will also help reducing over-concentration of people in urban areas in search of jobs—a chronic and common problem in many developing countries. Besides, manufacture of machinery for use in agricultural sector, certainly is welcome idea. This will facilitate modernization and mechanization of agriculture and increasing production level—a high priority area in Bangladesh<sup>34)</sup>—by making agricultural production more independent from susceptibility to the nature. In fact, drought and flood are two menacing problems and need earlier solution.

Again, rural based industrialization (specially in a country where most of the people live in rural areas) can be recommended from the point of view of capital formation. In Bangladesh productivity is low. And when per capita income (Tk 1208 in 1976-77)<sup>35)</sup> is low, demand is concentrated on basic food and other products of subsistent living. This results into limited economic activities



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because of very limited market for other products. Working as a negative force such economy reduces incentives and further delimitates productivity.<sup>36)</sup> This is one of the reasons why foreign private capital is far less enthusiastic toward undertaking economic ventures there.<sup>37)</sup> To overcome the constriction in capital formulation and accumulation, as well as the vicious circle of poverty, augmenting income of rural populace by finding them additional jobs is essential. Cottage industrialization may be one such way.

**Problems of Adaptations:**

A study of linkages of VHI to various other factors in terms of Parsonian AGIL model (Figure: 2) makes us aware of the area that demand clarification before attempting at adaptation of the system in a different society.<sup>39)</sup> First, Bangladesh may lack

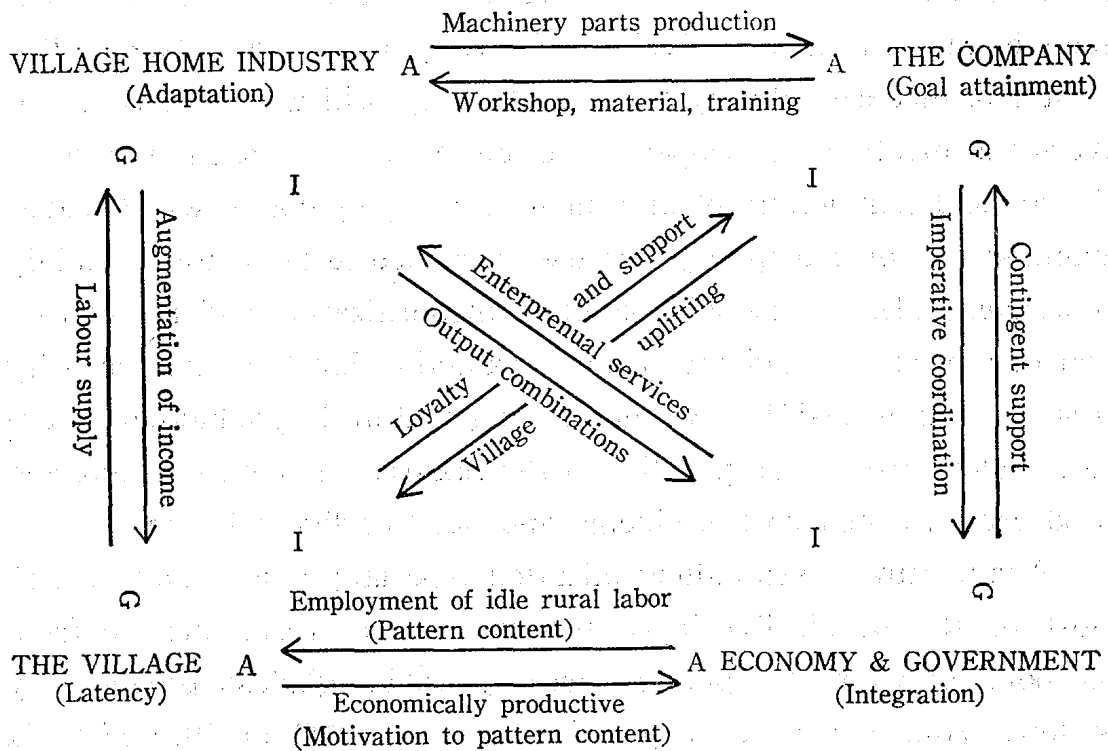


Figure 2. Augmentation of Rural Income through VHI system (Adaptive functions related to goal attainment)<sup>38)</sup>

manufacturing industries like Yanmar Diesel who have financial and technical capability and also are motivated highly to participate in the program. Here, different measures can be suggested to overcome the problems. Manufacturers may be attracted to take part in the venture by allowing them tax benefits. Government in contingent support may subsidize the installation of village work-shops. Technicians may be pooled for helping such manufacturers in starting the operation.

Next, we face the problem of economic overheads like power, transport and communication, which are important sources of so called 'forward linkages' for any such program. In Bangladesh more than any other sector of economy, the economic overheads would appear to be inadequate and overstretched.<sup>40)</sup> Hence at the start, it may concentrate on the villages where forward linkages are existing to a certain extent, and expand the program concurrent with improvement of infra-structure.

Further, in human problems we have to consider the motivational and psycho-social factors for joining in the program. Initiated from the local population, any such program should create a sense of cooperation and participation in the village. Motive for working hard and augmenting income should come from among the villagers and eventually lead to utilizing their work force including the female and the aged who are the two groups hard to be motivated to work in industrial production in a conservative rural society like Bangladesh. Again, there should exist a sense of mutual trust and commitment. (Refer to linkages in figure 2). Utmost care must be taken to encourage and maintain this, specially, in a society where lack of mutual trust in organizations is dominant. The close family-like tie found common in Japanese company-and-worker relationship<sup>41)</sup> is foreign in Bangladesh and makes it thus more important for cultivating this particular aspect.

Lastly, there should exist a sense of mission. Behind the start

and continuity of Yanmar VHI program, we find this sense of service and welfare to the villagers fairly dominant. In return, the villagers are strongly committed, and try their best to produce to the satisfaction of the company. In Bangladesh as we expect larger governmental involvement for translating the program into practice, the bureaucracy must fully be committed for the success of the operation. As in the case for any economic venture actions must be quick to facilitate against any holdup. Procedure for movement of files—the notorious unwritten rules of red-taping and control—needs simplification for a more practical approach and guiding incentives to the program.

#### **A Model Applicable for Bangladesh:**

An examination of cottage industry in Bangladesh shall indicate that much governmental weight is placed on support and promotion of indigenous and traditional cottage industry. But very little has been achieved to this respect. Figures reveal that cottage industries employ nearly 6% of total labour force. It is more than three times the labour force in large- and small-scale industries taken together. But productivity is extremely low. Output per worker in cottage industry is almost a third of the wage rate in small-scale and almost a fifth of that in large-scale industries.<sup>42)</sup>

Bangladesh needs redefining “cottage industry” to expand it beyond the limits of industries that “employ manual labour but do not use motive power”, so that home-based modern technological industries also come within the range of cottage industries. This will give a new direction for improving the existing cottage industries and also allow for introducing Yanmar-like VHI by inviting large industries—both domestic and multi-national—to venture in Bangladesh.

As evident from the previous discussion, a concerted action is necessary. Retated the governmental body, the manufacturing firm

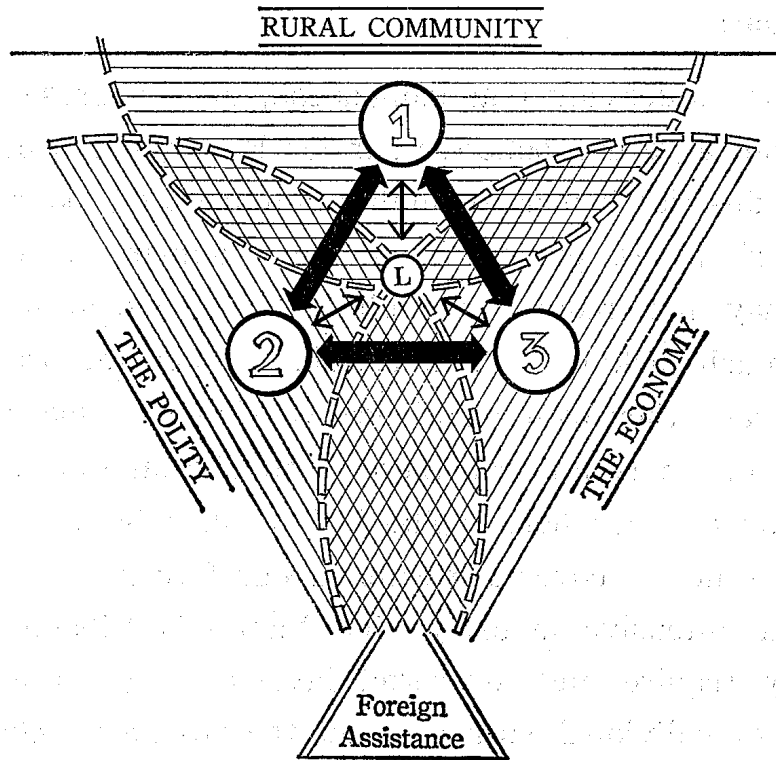


Figure 3. A Model for Application in Cottage Industrialization

1. Household Level Manufacturing workshops
2. Governmental Body with necessary political authority as head
3. Manufacturing Firm/Firms
- L. Liason personnel

and the village people must work together for successful adaptation of cottage industrialization whereby part of industrial production is brought for home level manufacturing. The role of liason personnel becomes focal and expansive (Figure: 3). Balance and time-to-time adjustment in the structural relationship of the government body, the manufacturing firm and the village becomes preconditional. The functional relationship will demand coordinational efforts and feed-back of entropy. The liason personnel, we envisage, becomes central in the linkages, and greater success of the program will depend upon his efforts and committment. In Bangladesh probably a community development worker can take the responsibility.<sup>48)</sup>

**In Conclusion :**

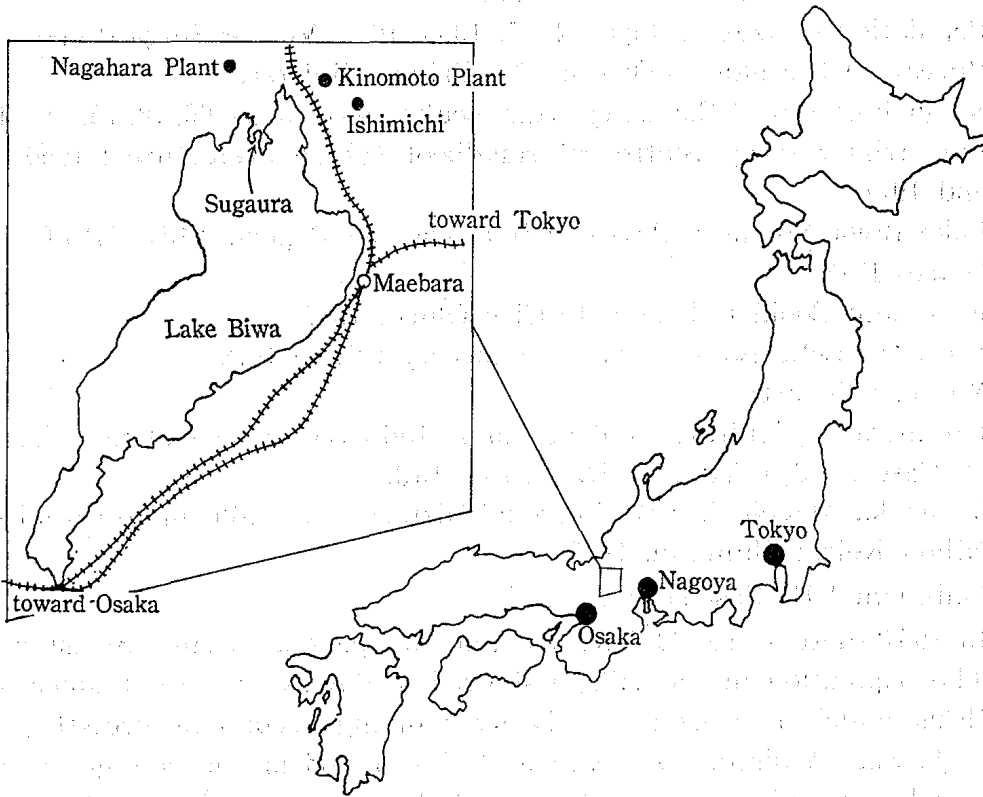
There is no denying that Bangladesh, at her present stage of economy and large unproductive surplus labour, needs more labour intensive industries instead of highly automatized production intensive industries. As evident from the Yanmar's case, such an industry may not require a high level of technical education which is much lacking in Bangladesh. A general orientation is enough and later their own experience working with machines make them efficient. In Bangladesh there is no shortage of man-power, so we can argue that where capital is limited, it is better to spread it thinly in order to cover a greater labour force.<sup>44)</sup>

A labour intensive industry, like Yanmar's Village Home Industry may require high overhead investment costs in terms of installation of individual workshops and the 'forward linkages' viz., road, power supply, etc. This may be beyond capacity of present Bangladesh economy. To this respect, advanced countries should come forward with helping hand and make it feasible for her to adopt rural-based labour intensive cottage industrialization, which contains some potentiality to serve as a buoyance for economic take-off toward development.

**Notes :**

- 1) Yanmar Diesel Engine Co., Ltd.; Established in 1912; Capital: 1,200 million Yen; Head Office: Osaka; International Business Office: Tokyo; Business activities: Production and sale of diesel engines and related accessories. Overseas associate companies: two each in Brazil and Indonesia, and one each in Malaysia, Singapore and Phillipines. The production capacity is above 6 million HP, while the actual production in 1977 was 5.1 million HP; the sales volume amounted to Yen 161.2 billion. Yanmar's share in Japan's total diesel engine export in 1976 amounted to 77% for Marine main engine, and 55% for engine for land use. (Source: Yanmar reports)

2) The location and vicinity:



- 3) In Ishimichi 20 persons, and in Sugaura 34 persons are engaged in manufacture of some simple parts on Lathes, Drilling Machines, Grinders, and Milling Machines.
- 4) In the prevailing thought in India, for example, capital-intensive efficient production is required for the capital-goods industries and for export, but labour-intensive methods are applied in the field of home consumption. (Kindleberger, "*Economic Development*", McGraw-Hill Gogakusha, 1965, p. 262).
- 5) It may be mentioned that man's capacity for work is hardly 1/6 of a horse power and two bullocks hardly supply 1/4th of a horse power whereas by using power machines, a farmer can use 50 hp tractors threshers, harvestors, power irrigation pumps, etc. But in Bangladesh with agricultural work force of 15 million (1961 Census) people, there are only 2,070 tractors (June 1970) and 3,614 power tillers (June 1970). Again, 18,125 big power pumps with an average capacity of 50 hp irrigated 644,800 acres of land (in 1970). In addition, 12,000 fractional low lift pumps have been introduced. (Source: Dr. ALIM A., "*An Introduction to Bangladesh Agriculture*", Swadesh Printing Press, 1974)
- 6) In Bangladesh it is estimated that about 20% of work force are either unemployed or underemployed; we may add to this seasonal unem-

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- ployments, that are common among the agricultural work force.
- 7) The secondary data sources, include:
    - Population Census of Japan 1955, 1965, 1975 (Vol. on Shiga Prefecture); Bureau of Statistics, Office of the Prime Minister.
    - Shiga Prefectural Statistical Handbook: 1950, 55, 60, 65, 70, 75, and 1977.
    - Industrial Survey Statistical Handbook (Shiga Prefecture): 1966, 1971 and 1977.
    - Lake Biwa Northern Areas (Mimeographed Report, Shiga Prefectural Office) 1978
    - Kinomoto Booklet (Kinomoto City Office) 1977
    - West Asai-cho Booklet (West Asai City Office) 1978
    - Yanmar Reports
    - Ishimichi Agricultural Village Home Industry—Iron Cutting Farmers (A Case Study), Yanmar Diesel Co., Ltd.
    - Yamaoka Magoichi, "My Personal History" (Watakushi no Rireki-sho), Nihon Keizai Shimbun, 1973
  - 8) Ishimichi VHI Case-study, op. cit.
  - 9) In 1954 there were 62 families and 250 persons living in Ishimichi. The population in the village showed a downward trend since mid-1960s which is considered the start of high economic growth period in Japan. A distinctive feature of this period is the younger generation leaving village occupations and drifting toward the glamour of city life. In 1969 the number of families in Ishimichi reduced to 56 only. But by mid-1970s illusion of city life started fainting, and new U-turn phenomenon of returning to home-town or half way to home-town became fairly common. Youngsters started staying home or at near-by smaller cities and towns. Another factor needs mention that the birth rate had a sharp decline in post war years which also contributed to the reduction in total population of the village.
  - 10) Before Ishimichi belonged to Ika-Gun (district); but since the abolition of Gun in Japan, Ishimichi is included in 'Kinomoto-Cho' (town).
  - 11) "Farming Only" is the occupation for four families, while 34 families consider "Farming as Secondary Occupation". (Source: 1975 Agricultural Census of Japan)
  - 12) Ishinichi, op. cit.
  - 13) The name follows the Japanese style of family name first.
  - 14) About an hour's drive across the high hills takes to Sugaura.
  - 15) Nishi Asai town-office report.
  - 16) Reported by the Supervisor in Sugaura.
  - 17) At Ishimichi from the Nagahama Plant, and at Sugaura from Nagahara Precision Machinery Plant.
  - 18) Working from 9:00 A.M. to 5:30 P.M.

- 19) Ishimichi VHI Case Study, op. cit., quotes, "The villagers who are skillful with hoes in the field have to wrestle with milling machines or drilling machines. Some of them said, 'I know how to cut wood with iron, but I cannot understand how I can cut iron with iron'. They were so ignorant to modern industries that even a very simple work was hard for them to master"
- 20) They were supposed to take care of the workshop also. The training took about a month to teach only the basics; after which regular supervision and guidance during work improved their ability.
- 21) Today they are running household workshops very smoothly. The rate of working varied among them to a certain level, but is considered in average satisfactory by Yanmar. (Reported by VHI Supervisors)
- 22) The rating varied from about 75 for a rather dithering old woman, to about 110 for an old man who did not even take his eyes off his work. (Michael Pereirs's report)
- 23) The accident occurred several years ago in which a worker lost his fingers. The Supervisor emphasized that the accident occurred due to over-confidence of the worker from operating the machine for many years. Since after that the villagers have become more careful in operating the machines.
- 24) The age of most workers range between 40 to over 70. More workers fall in the older age group. The oldest person was 76 years old.
- 25) Ishimichi, op. cit.
- 26) "The life style such as 'Half-agriculture & half-fishery', or 'Half-agriculture & half-merchandizing' will become 'Half-agriculture & half-industry'. We have to find harmony between agriculture and industry." (Source: Ishimichi, op. cit.)
- 27) In Japan it is generally the eldest son who is supposed to stick to the traditional job of the family, while the youngers are allowed and encouraged to pursue their own career.
- 28) "Twenty Years of Pakistan", News Print Edition, Pakistan Publications, 1969, p. 204.
- 29) Ibid.
- 30) Ibid.
- 31) Azizur Rahman Khan, "*The Economy of Bangladesh*", Macmillan, 1972, p. 39.
- 32) "Bangladesh", A Fortnightly Journal, Vol. 111 No. 5, 15 Sept. 1979, Ministry of Information and Broadcasting, Dacca.
- 33) Based on 1961 Census. The population has increased from 70 million in 1968 to more than 85 million now. Ibid.
- 34) Speech by the President of Bangladesh at United Nation's Food and



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- Agricultural Organization (FAO) conference, July 14, 1979 on Agrarian Reform and Rural Development.
- 35) One Taka is approximately Japanese Yen.
  - 36) Kindleberger, Charles P., "*Economic Development*", Second Edition, McGraw Hill Kogakusha, Tokyo, 1965.
  - 37) Oxxal, Ivar; etc. (ed.), "*Beyond the Sociology of Development*", Routledge & Kegan Paul, London, 1975.
  - 38) Adopted from Talcott Parsons, "The Structure of Social Action", McGraw Hill, New York.
  - 39) We are aware of the criticisms against and the limitations of the model. But in the absence of a substitute, this model furnishes us at least with some insight to the problem.
  - 40) A.R. Khan, op. cit., p. 77.
  - 41) Dore Ronald, "*British Factory—Japanese Factory*", Unwin Ltd., London, 1973.
  - 42) A.R. Khan, op. cit., p. 59.
  - 43) Community development workers are well trained workers for helping these communities mobilize their potential for their development.
  - 44) Our views may differ from those of economists and industrial planners (see for example, Kindleberger; and A.R. Khan, op. cit.); but we believe in putting weight toward augmentation of income of the people through increased employment opportunities to absorb the vast unproductive labour force.