

APPROPRIATE TECHNOLOGY FOR RURAL SECTOR

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Synopsis

In developing countries major attention has to be paid for the development of rural sector. Some devices have to be adapted to suit the existing conditions of such sector. Appropriate technology which generally involves low cost labour-intensive and small scale processes and equipment could be the device for such development. It has got recognition as an effective means of development and important component of over all development strategies. This has been already proven by some of the developed and developing countries in Asia. In the recent past, we have developed some appropriate technologies in Sri Lanka, yet there is scope for development of new appropriate technologies. Therefore, the needs for the participations are very much essential through the well organised, net work.

The Need for Appropriate Technology

In most of the developing countries conventional development programmes have generated some degree of success in terms of economic growth and production, but they have also caused certain negative effects. These negative effects are becoming widely recognised and acknowledged, such as increasing migration from rural environmental break down, social and cultural distribution of benefits, and increasing economic dependence. This has occurred mainly because of an emphasis on capital intensive techniques, a tendency to locate new industries in a few major areas and a lack of policy measures aimed at generating productive employment opportunities in rural areas, where majority of the population in the

developing countries still live. Currently growing attempts are being made to focus on various aspects of rural development, such as education, health, housing, irrigation and so on. However, it must be realized that rural development would be achieved greatly through appropriate development technologies, processes and systems that are made available to the rural people.

The need then is for technologies which are adapted to conditions which exist in different rural communities. They should promote economic and social development relying on local skills and resources rather than foreign imports. In addition, such technologies should play a complementary role to large scale industrial projects in order to build up strong economic structures.

What is Appropriate Technology?

Appropriate technology is technology which is most suitably adapted to the conditions of a given situation. It should be compatible with the human, financial and natural resources which surrounds its applications.

Appropriate technology need not, and indeed should not be applied only to rural areas in developing countries. Its basic principles are universal. However, rural areas require special attention to fulfil the basic needs. Appropriate technology applications

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the natural systems. Appropriate technology will have the advantage of reducing developing area's cultural and economic dependence on other industrialized nations.

Past Experiences of Appropriate Technology in Other Developing Countries

It is clearly seen in the past, in some developing and developed countries, the application of appropriate technology has been contributed tremendously for the countries' development.

For example:

Utilization of Bio gas in India and China

Utilization of two wheel tractor in Japan and Taiwan

Hand tools for agricultural sector in Japan.

In India the widespread use of cattle waste as cooking fuel was a serious problem, since it was preventing its use as a fertilizer for agricultural production. In order to make use of it, for both the purposes, new, alternative methods had to be found. As a result, Indian Agricultural Research Institute was able to respond to this need by providing the scientific and engineering researches.

The bio-gas plants that were developed by this research were ideal for farmers with four or five cows. Construction of the plants is labour intensive and almost all the necessary skill and resources are available in rural areas.

A number of important aspects of appropriate technologies are highlighted in this case study. The real needs are satisfied by the technology, i.e. the need for fuel and fertilizer. This has positive impact on the development of rural areas.

Likewise, utilization of hand tractors and hand tools also greatly contributed to the development of agriculture

sector, with regard to the food production, employment and agricultural machinery industry in Japan and Taiwan.

Links to Appropriate Technology Development

In approaching the question of appropriate industrial technology from an examination of basic development needs, a mechanism is necessary to link an integrated appropriate industrial technology to the overall development process.

Through such a process the concept could be placed in the main stream of the industrial development effort.

The following sectors could be selected as links to the appropriate technology.

- Low cost transport for rural areas
- Agricultural machinery and implements
- Energy for rural requirements
- Food storage and processing
- Drugs and pharmaceuticals
- Light industries and rural work shops
- Construction and building materials
- Basic industries.

In the case of energy for rural requirements, the conventional energy systems based on centralized sources have failed to yield adequate electrical power for the demand of rural sector. However, the bulk of the energy for the domestic sector of developing countries now comes from non-commercial sources such as fuel wood. Although, commercial energy consumption in these countries had been increasing rapidly and also will find it difficult to maintain the use of adequate fossil fuel due to the rising of cost.

Therefore, energy must be secured from alternative sources such as:

- Bio mass energy
- Wind energy
- Solar energy
- Mini hydro energy



are likely to have some common characteristics. They will usually be:

Labour intensive,
Simple,
Small scale and
Low cost.

Since the labour is in excess and relatively cheap in the developing countries and capital is scarce, appropriate technology for these countries particularly in the rural sector is low in capital and high in labour content.

The technology should be simple enough to be used by the people to suit their educational standards and skill levels. It would not require much specialized training.

Small scale technology is necessary, if it is to be used by a village, a group, or a simple family. It must be affordable and operatable at a community level.

The technology would not depend too much on the importing of expensive materials or components by adapting appropriate technology. Products should be produced locally using local materials by local people with easy maintenance.

It is important that, a technology which is appropriate for one country, or for one area of a country may not necessarily be the most appropriate under different conditions prevailing elsewhere. Further, a technology which is the most appropriate for only one area today, need not necessarily be optional at some future date.

After the real need or problems have been carefully identified, it is necessary to decide which technology provides the most appropriate solution. In addition, several other factors could be taken into consideration.

The technology should be flexible

and benefit as many people as possible to the changing needs of the community. It should not conflict with the local ecology.

Finally, it should be acceptable to the people who are going to use it. If a technology is not willingly used by the people, it will never be successful.

Some Available Options to Approach Appropriate Technology

A successful application might contain elements of several of following options.

1. Adopting of improved traditional indigenous technology.
2. Adopting of modern progressive technologies.
3. Reviewing on old technology.
4. Accepting a scientific "modern" technology.
5. Developing a new technique.
6. Transferring technology within or among developing regions and countries.

The Advantages of Appropriate Technology

Appropriate technology stimulates production in rural areas, and can create many spin-off benefits. It increases rural employment, and therefore will help to cease migratory flow to already over populated urban areas. Increased employment will also tend to redress the inequalities of income and more individuals will find themselves directly involved in a development process. The smallness of appropriate technology in many instances will result in causing less distribution less pollution, compared to many other technologies.

Appropriate technology will have beneficial effects on the economy due to generation of multiple effects such as supply of raw materials, processing and distribution of products. It is also complementary to environmental conditions, rather than reacting against

Institutional Support for the Development of Appropriate Technologies in Sri Lanka

During the past few years in Sri Lanka appreciable attempts have been made for the development of appropriate technologies. Very few governmental institutions have taken steps to promote some appropriate technology applications such as windmill for lift irrigation, bio gas for domestic usage and Prasakthi for electrification of rural houses.

However, the progress made on some of the technologies above were not successful enough, when compared to the standard of other developing countries.

It may be quite possible that this is due to many reasons, such as lack of co-ordination between the community and the institutions, inadequate financial facilities and encouragement given by the government to develop suitable products, processes and systems within the acceptancy level of majority of rural people. Hence the technology cannot be progressed to fulfil the needs of such sector.

Therefore, it is necessary to overcome such difficulties by establishing proper co-ordination and co-operation among the institutions including national universities and public, in order to get along with better relations with them, thereby identifying rural problems and seeking better solutions.

It will also be helpful to establish inter institutional relationships, whereby ideas and information could be exchanged; further, duplication of any appropriate technologies could be prevented.

Furthermore, it is necessary to provide financial facilities to carry out research and development works and extension works, also financial and moral encouragement and appreciation

are needed to enhance the efforts for the development of appropriate technologies.

Another very important aspect is to fix priorities on various types of appropriate technologies, depending on the policy decisions of the government.

Then, this would lead to establish appropriate technology programmes in well planned manners. Thereby rural sector will be able to get multiple benefits.

At present, there are several institutions involved in such activities. Some of them are:

- Water Resources Board
- National Engineering Research and Development Centre (NERD)
- Industrial Development Board (IDB), mainly through its Appropriate Technology Research and Development Centre (A.T.R.D.C.) at Pannala.
- Agricultural Department, mainly through its Agricultural Farm Mechanization Centre (AFMC) at Mahailuppallama.
- Sarvodaya
- Marga Institute
- National Youth Services Council etc.

Among these institutions, we in ATRDC have organised these programmes jointly with the Technical Co-operation of Japanese Government. This aims at developing manufacturing capabilities of rural, small and medium scale industries and developing technologies to the required conditions by utilizing technologies already available elsewhere and modifying it to suit the local situations.

Initially, Centre has identified following three types of appropriate technologies:

- Gas producers for driving engine

pump sets.

- Wind power electricity generation for domestic use.
- Hand tools for agricultural sector.

Gas producer which consumes charcoal, wood chip, paddy husks and the other agricultural wastes as an alternative source of energy to replace petrol and diesel fuels.

Windmills for generating electricity, using car alternator and wooden blades in single pole mounting structure, will help Prasakthi users to charge batteries.

Various types of hand tools will cause a great impact in the development of the agricultural sector and also provide employment opportunities for the rural sector. These tools could be developed depending upon the crops, nature of operation and soil conditions using high carbon - low carbon forge-weld techniques.

The village blacksmiths and farmers can get together to develop these implements when the manufacturing know-how, training and other types of facilities were provided to them.

In future, we are hoping to develop appropriate technologies for briquetting process, pottery industry, solar energy utilization etc.

In Sri Lanka, there is enough scope to develop appropriate technologies for traditional processing industries and the other types of related sectors.

For example:

Solar energy would be a good application for the processing of rubber and tea industry.

Conclusion

As a developing country it is essential to recognise the importance of appropriate technologies for awakening of rural sector. Therefore, research and action should be integrated and carried out locally as much as possible. What is needed is a national wide awareness, so that a large number of institutions in various specialities engage themselves to work on rural problems. In this context National Universities have to play a major role by identifying rural problems and work out solutions. Hence, research institutes and documentation in appropriate technology are very necessary, so that it specifies problems, provides information, co-ordinates the work and identifies the line of development. It would also co-ordinate with the other National Agencies on problems and ensure the greater utilization of the products of the village industries.

References

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