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Meeting on Promotion of Small
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APPROPRIATE TECHNOLOGY INCLUDING
RESEARCH AND PROTOTYPE DEVELOPMENT ^{1/}

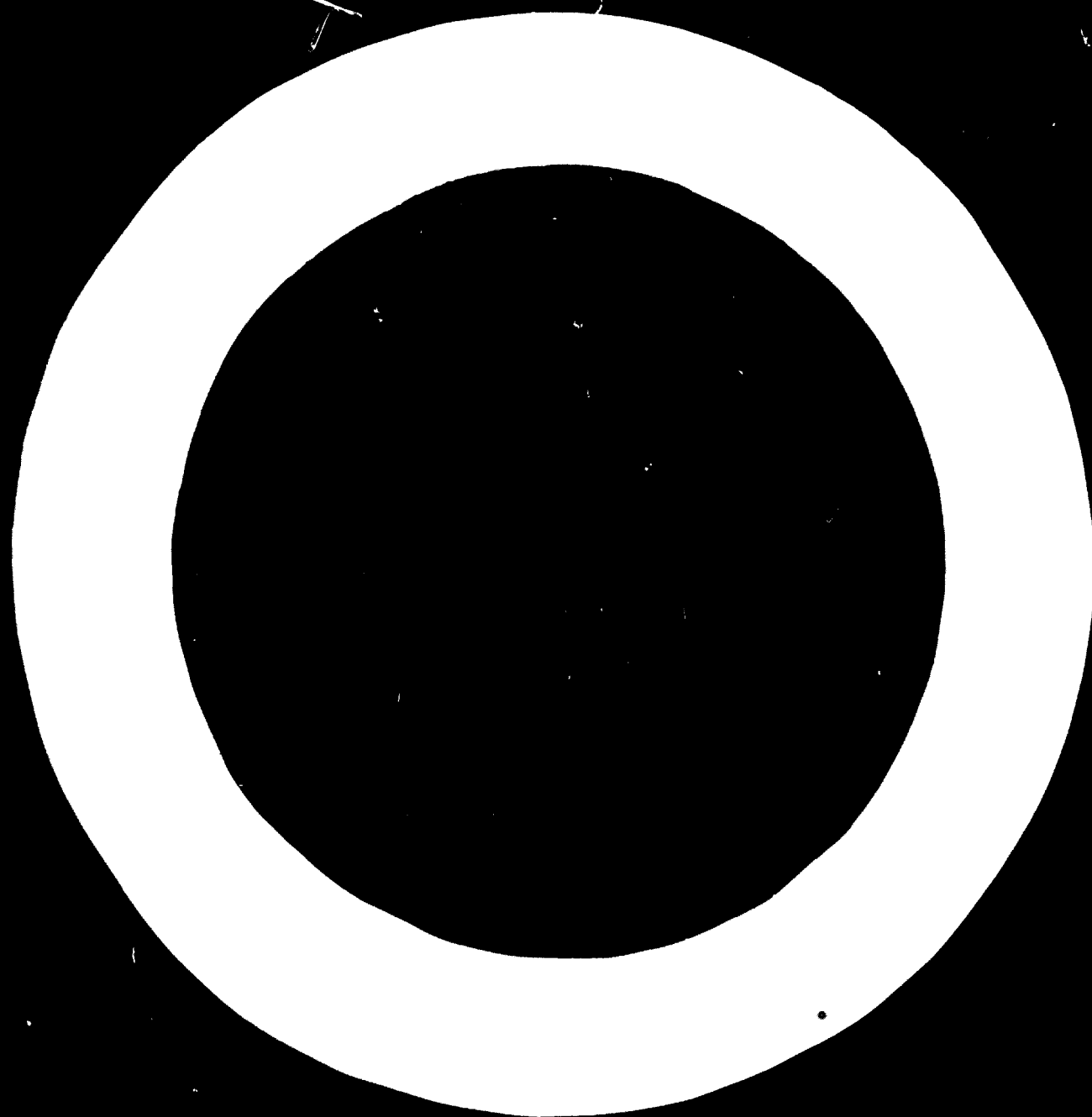
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MEETING ON PROMOTION OF SMALL INDUSTRIES IN RCD COUNTRIES

AGENDA ITEM II •

APPROPRIATE TECHNOLOGY, INCLUDING RESEARCH & PROTOTYPE

DEVELOPMENT

The background of the evaluation of the concept "appropriate technology" needs some explanation in order to have a proper appreciation of the issues involved. The concept of what is described as an "intermediate technology" was first formally enunciated by Dr. Schumacher in a paper published in 1962. The objective he had in mind was the creation of millions of jobs in industry. For this purpose he felt that a technology must be evolved which is cheap enough to be accessible to a larger sector of the community than the very rich and can be applied on a mass scale. According to him the most important consideration in evolving a technology for industry should be lowest investment possible per workplace.

The concept of intermediate technology in industry was often interpreted as adoption of a technology which was not as efficient and sophisticated as the most advanced technology of the advanced countries, but more advanced than the traditional technology of the developing countries. Industrial technology as it developed in advanced countries had become more and more 'capital intensive' and 'labour saving' and it was argued that such technology will not be suitable to developing countries with chronic problems of shortage of capital and unemployment. The inference therefore was that the technology which was good for the most advanced countries yesterday would be suitable for the developing countries today.

The obvious fallacy in this approach was that it was assigning to developing countries what was "second best" in

industrial technology, and thereby perpetuating a pattern of development which would place them always one step behind. The main criterion in industrial production should be efficiency and this was likely to be sacrificed if industries adopted a technology which was not the very best. Therefore intermediate technology as a general prescription for all types of industries and all developing countries was quite unacceptable. Instead it was argued that technology "appropriate" to the conditions of different locations and different groups of industries should be evolved in developing countries, keeping in view their basic problems of capital shortage and labour abundance.

The question for consideration for those of us who are concerned with the development of small scale industries is whether it is possible to adopt a technology specially for small industries in developing countries different from that for large industries. It is obvious that no general rules in this regard can be laid down. It is true that one of the important objectives of small industry development is the creation of employment opportunities. At the same time it cannot be overlooked that small industries are expected to survive in open competition in the long run without external support or subsidies. In industries where technology is the decisive factor in efficiency and where small industries have to exist in competition with other industries, small industries have no choice but to opt for the latest and best technology.

At the same time, there are certain groups of small industries where technology may not be a very crucial factor in efficiency. Such industries will have to be identified and careful studies made about the technologies most appropriate for their efficiency.

The concept of appropriate technology can be a relevant factor for small industries located in rural areas. One of the objectives of small industry development is to ensure industrial dispersal and balanced regional development. There are vast rural areas in developing countries which are patently unsuited for location of sophisticated industries. At the same time they may have scope for certain industries based on local resources, skills and demands. Agro-based industries and leather and wood-based industries are some typical examples. In certain rural areas power may not be available but there may be scope for certain processing and manufacturing operations. In such cases, the need for evolving appropriate technologies, i.e. technologies appropriate to the location and the nature of the industries, becomes obvious.

It will be difficult to borrow technologies from advanced countries to suit the special needs of the rural areas or special categories of industries in developing countries. Developing countries themselves have to evolve the technologies suitable to their special needs. Of course this is a task new to developing countries, but probably this is a field in which United Nations assistance will be available.

The main problem in developing countries engaged in development programmes for small scale industries is the shortage of trained personnel. The development programme calls for the services of personnel trained in a wide range of skills - economists, cost accountants, management specialists, industrial engineers, chemical engineers, planners etc. The promotion and extension programmes themselves take a major part of the time of the people engaged in small industry work and therefore there is very little scope for research and prototype development work in such organisations. Development organisations need considerable strengthening at all levels if they are to undertake research and prototype development projects.

The need for research exists, not only on appropriate technologies but on a variety of problems which may be of direct interest to small producers. These problems relate to machinery and equipment, use of raw materials, fuels, design and quality etc. It may be difficult for a development agency, even if adequately strengthened, to deal with all such problems. Industrial research requires a special cadre of scientists and technologists and well-equipped laboratories and workshops. It will therefore be advisable for developmental and extension organisations to link themselves to well-established industrial research institutes to whom they can refer the research problems arising from small industries. Several developing countries have industrial research institutions, even though they may not have formal links with extension organisations engaged in small industries. We shall be glad to know about the arrangements in other developing countries for dealing with research problems relating to small industries.

Development of prototypes of machinery and equipment for eventual commercial production by small industrialists is a useful service which a development organisation can provide to small industries. Small industries have often to pay very high costs for borrowing technical know-how from advanced countries for their manufacturing activities. Foreign machinery and equipment sometimes require adaptations and changes to suit local conditions and needs. Prototype development, either original or by adaptation can thus be of great assistance to small industrialists. Here again, the problem is one of man power and resources. Prototype development programmes require a cadre of specially trained technicians and well-equipped workshops. It may be difficult for a small organisation engaged in extension service and promotional work for small industries, to set up the facilities for prototype development.

In the order of priorities, in a developing country, such programmes will not get proper attention and therefore are often left out. A practicable solution will be for small industries organisations to be associated with well-established research and developmental institutions for its prototype development programmes. The small industries organisations should refer to such institutions problems for prototype development relating to small industries, instead of trying to build up parallel facilities out of their own resources.

In this connection, I wish to mention that our Organisation has attempted to evolve prototypes of some lensgrinding machines for use by small industries. The mechanical engineering workshop at the industrial estate Ahmaz has made the prototype of a spherical lensgrinding machine which is currently being used in our training programmes for lensgrinding. The prototype of a cylindrical lensgrinding machine is nearing completion. After satisfying ourselves on the techno-economic feasibility of their production on commercial lines, we intend to turn over the designs and the prototypes to interested small industrialists.





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