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07667

Distr.
RESTRICTED
UNIDO/IOD.116
7 October 1977
ENGLISH

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

MANAGING TECHNICAL INSTITUTIONS FOR INDUSTRIALIZATION^{1/}

prepared by

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MANAGING TECHNICAL INSTITUTIONS FOR INDUSTRIALIZATION

The following notes are based on a round-table discussion which took place under the Chairmanship of Mr. G.S. Gouri, Deputy Director, Industrial Operations Division, on 11 February 1977^{1/}. The meeting was an informal exchange of views among senior UNIDO staff and three high-level consultants who were preparing to take part in an international seminar on the Role of Technical Institutions in the Industrialization Process^{2/}. Since the discussion seemed to arouse a high degree of spontaneous "cross-fertilization", some excerpts have been assembled in the following paragraphs.

A. Designing and Establishing Linkages

1. If we are talking about building the technological capacity of a country, the subject covers a broad range from the planning of industry through to a number of servicing functions. In this context, it is possible to identify requirements and to allocate resources towards an ultimate goal. Institutions are simply a means of applying the resources.

2. Regardless of any particular definition of "technical institutions", the question is whether we are getting maximum returns for industrialization from the inputs to an institution. Frequently the linkages between institutions and the system of national objectives are obscure or poorly defined. When the linkage is clear, what the institution must do becomes obvious.

This frequent lack of linkages has been a weakness. Often, an institution will simply concentrate on an activity. It fails to consider how the activity can or should contribute to realization of the ultimate objective. As a consequence, much of the work may be worthless. Some of the remedies may be: a) to tie-in to national development plans; b)

1/ Attendees included UNIDO staff members Messrs. A. Swamy-Rao, S. Ndam, F. Soede, W.R. Millager from the Industrial Operations Division, and Messrs. N. Hamr-Ericson, E. Aguilar, J. Cabrera, H.W. Tanaka from the International Centre for Industrial Studies. The consultants were Messrs. J.H. Yang, V.P. for Research, Korea Inst. of Science and Tech.; H.C. Visvesvaraya, Director, Cement Research Inst. of India; and Mr. Akinrele, formerly Director of a Research Inst. in Nigeria and now Head of the Centre for Institutional Development of ACP-EEC, Brussels.

2/ Please see document ID/WG.246/6, Final Report "Utilization of National Technological Institutions in the Developing Countries for Industrialization. The document is the report of a seminar organized by Mr. Ndam, which took place in Trinidad.

to balance the long-term and short-term elements of the institutional programme; c) to pool available national competence; and d) to design plans and programmes to fill the identified gaps.

3. There is gross under-estimation of the pressures on technical institutions from outside. For example, pressures from speculators, investors and so on, aimed at influencing decisions. In any case an institute may never itself have decisive influence on a project decision. Developing country officials (decision makers) seem to feel that they should engage in direct negotiations with overseas producers of plant equipment. As a result, institutions must consider what they can realistically contribute. One aspect of this issue to be carefully considered is the opportunity for development of "client relationships" between technical institutions and decision-makers. An environment of trust and confidence built up gradually might assist in ensuring effective participation of the institution when important technology selection decisions are made.

4. If the linkage/relationship issue is clarified, the next weakness may be in converting identified needs into practical projects - for example, the conversion of research output to turnkey operation of a factory and to the enhancement of productivity.

B. Long and Short-range Programmes

1. An institution may try to lead in developing new industries, or it may help existing industries through testing and other services. There is a possibility that the performance of research may stimulate the development of technological capacity which may eventually be used indirectly (even if the immediate results are minimal). Such research may involve either hardware or software. Oft-times, the objectives of an institution are very clearly stated but are broad enough to cover almost anything. But for a goal to be practically attainable it must be set to match the capability of the institution - for example what sub-sector or branch background does the institution have?

2. The industrialization process must be seen as a combination of

short-range and long-range development activities. Many countries cannot wait for the long-range results and must therefore import technology available elsewhere. Their biggest need is to strengthen their capacity to negotiate for the acquisition of technology. In parallel they must evolve institutions and programmes to build their long-range capability.

3. The term "long-range" is usually understood as referring to basic research but we can usefully divide the idea of long-range into two categories: (a) fundamental research, and (b) tasks aimed at adaptation or application of technology - tasks which take longer than the time available to fill current needs of industry.

4. Developing countries cannot afford to do long-range research - they have neither the money nor the technical and managerial skills. They should let the rich countries do it. Developing countries should take the results of such research, select the best ones, then use them. Developing countries' "research" work should be objective-oriented research. To illustrate the above, the U.S. might have a 10-year project before realizing practical results. Our maximum would be a 3-year project. We cannot wait for the longer pay-off. Furthermore, in some countries the use of research results is not effective.

5. In general, money for long-range activities must come from the Government because industry won't pay. When money does come from the Government for such programmes there is frequently a demand the following year for results, and this leads to many problems for the institutions.

6. It may be said that we work on the same subjects as developed countries but we choose projects for minimum cost and minimum time to obtain useful results.

C. The Technology Acquisition Spectrum

1. There is a spectrum of activities related to acquisition of technology. On the one hand is negotiation for importing technology; the range continues with adaptation (both short and long-range) with local development and with extension services. These activities are all intrinsically

related to national goals. Sometimes it is fairly clear what should be done to serve a national goal but there may be problems of determining who should carry out the work. There are opportunities to bring in co-operation among developing countries in this process.

2. It is important to recognize that there is considerable difference between making good use of existing institutions with their established objectives and, on the other hand, designing and creating institutions as elements of a national system which relates institutions to the main stream of industrial development.

3. It is useful sometimes to consider "horizontal" research and development: i.e. planning or other functional steps for all industrial branches. In contrast a "vertical" approach would relate to all stages of producing leather and leather products as an example^{1/}.

4. One approach would take a product or a sector - for example the cement industry. If an information base can be obtained, one can determine what technology is coming in and what is needed, say, during the next 10 years. This can help to determine a development programme aimed at increasing national value-added.

5. Most technology which is called "new" is simply a re-combination or permutation. We often call technology "indigenous" even when the term means only that local materials are used. Usually we simply digest or modify something from outside.

D. Technical Assistance and Co-operation among Developing Countries

1. Countries can be classified under three groups. The first group does not have technological institutions (there are probably 40 countries in this category); they are trying to figure out what they need. The second group has plenty of institutions but the whole system does not work - they are unhappy. The third group, such as India and Korea, have well-established institutions and seem to be deriving considerable benefit. Groups 1 and 2 can probably benefit from being exposed to the experience of the third group.

^{1/} A third kind of classification (not mentioned in the meeting) can be called the "vector" approach. It begins with a major item such as "cattle" and traces inputs, products and by-products to arrive at a synergistic integrated package, without arbitrary content restrictions.

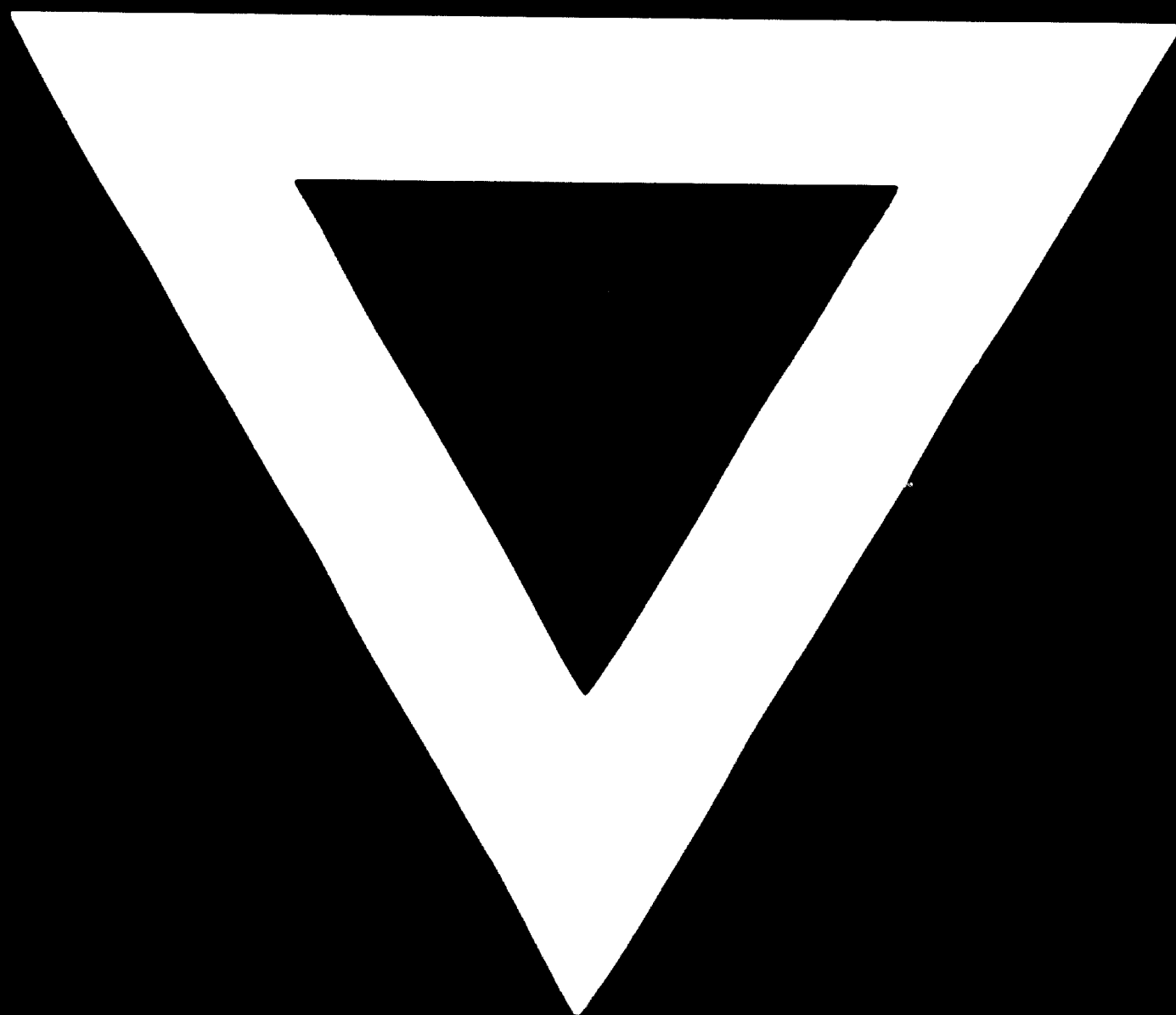
2. It is probably not possible to increase technological capacity fast enough using the traditional way of the last 25 years. But requirements in the villages are not so sophisticated. A whole range of possibilities may be opened up by better use of natural resources catalyzed by small technical improvements.

3. An important aspect of co-ordinating institutional activities with national plans is the question of ensuring the flow of information. It should be useful to ask how this question has been solved in those countries thought to be successful. How can it be tackled in other countries?^{1/}

^{1/} Please see ID/107 "National Approaches to the Acquisition of Technology" and UNIDO/IOD.106, "The International Transfer of Industrial Management Skills".



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