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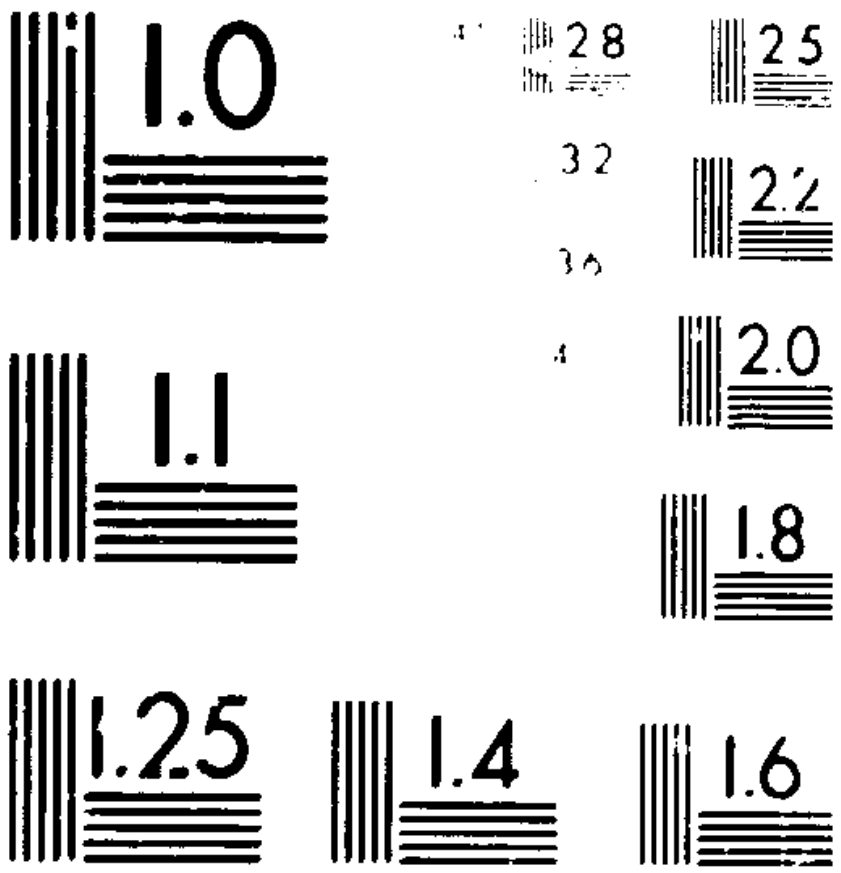

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PROBLEMS OF NATIONAL ECONOMY INDUSTRIALIZATION
IN DEVELOPING COUNTRIES. HUMAN RESOURCES ISSUES.

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1236

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The problem of national economy industrialization in developing countries have been repeatedly discussed during the last decade by numerous international forums. The adopted documents, among which the Declaration of Lima and the Plan of Actions, introduced by the II UNIDO General Conference in 1975 are the most important ones, projected a programme of actions aimed at increasing industrial output in developing countries. Later on this programme was further elaborated. What the developing countries do not lack is the recipes as to what to do for the solution of the problem of national economy industrialization. Nevertheless, the present rate of the increase of developing countries' share in the world industrial production shows that execution of the adopted programme is only half successful. The following seem to be the key issues of industrial development:

- increasing the scientific and technological potential;
- providing reliable energy supply;
- industrical processing of raw materials;
- supplying the necessary financial resources;
- providing the accelerated development of human resources.

Solution of each of these issues depend on an extremely complicated programme of measures which may be implemented through the carefully aimed strategy on the part of developing countries and with broad assistance from developed states. Training skilled labour is one of the most urgent issues among those mentioned above. It includes a wide spectrum of educational problems such as training scientists, engineers, techicians and workers to meet the demands of national economies as well as permanent upgrading of their skills.

Activities of UNIDO and other international organizations, practice of multilateral and bilateral international cooperation on the problem in question as well as various proposals presented on many accasions by both developing and developed countries help to shape the principles of solving the labour problem with the purpose of national economies industrialization in developing countries. The main of them are as follows:

- complex approach;
- thorough selection of goals;
- careful planning;
- setting and maintaining the ratio between the usage of own resources and external aid;
- maintaining the balance between national, international goals and aims of organizations and companies involved.

The 1st UNIDO Global Consultation on training labour for industry held in Stutgart (FRG) in 1982 helped to specify these principles.

For the purposes of practical application it is essential toclearly realize the mechanics of utilisation of the above principles.

1. A COMPLEX TASK OF THE HUMAN RESOURCES PROBLEM

A complex nature of this problem is determined by its two basic aspects: firstly, by interconnections with other tasks of national economies industrialization and, secondly, by the usage of various forms of education and skills upgrading.

Let us consider the interconnection between the human recource problem and the tasks of developing scientific and technological pothential and the energy supply problem. The shave of developing

countries in the world scientific and technological potential is 5%. About 6% of the world fund of the registered patents are issued to applicants from developing countries. Even so, the patent rights owners from industrially developed market economy countries are responsible for the lion share of this tiny percentage of the issued patents. The analysis of the energy demands of the young developing countries points out the necessity of finding a radical solution for the task of providing a reliable supply of energy. By the year of 2000 the developing states will require about 30% of the world energy production for the performance of their industrialization programmes and during the next quarter of the century their demands might increase up to 50% of the world energy production. Execution of industrialization plans is seriously hampered by the intellectual backwardness of developing states, which account for 75% of the world's population. This fact is illustrated by the literacy data. Only 60% of the population of the countries in Asia and only 40% in Africa are literate.

The interconnection between the tasks of increasing scientific and technological potential and the labour problems points at impossibility of solving the former for the lack of skilled labour and specialists. This could be illustrated by the practice of the Soviet-Indian collaboration in the field of space research. To benefit from the access to the Soviet space technology the Indian experts had to undergo special training in respect of utilization of space techniques in geological, geophysical and meteorological research.

The interconnection between the task of providing the reliable energy supply and raising the level of education could be

characterized in a similar way. Execution of large-scale energy programmes in developing countries puts forward as one of the principal conditions the availability of the specially trained personnel. The Soviet experience in cooperation with developing countries withesses in favour of the possibility of the successful solution of this problem. The Soviet organizations have already performed and are now performing the orders from developing states for the construction of power stations equal to the total capacity of 29,1 thousand MW in such countries as India, Syria etc. More than 70 thousand specialists from developing countries were trained at the Soviet training centers abroad and at industrial facilities in the USSR. Now they are successfully working in the various industries of the national economies.

All the tasks under consideration are interconnected. Mastering the new energy production technologies is closely tied up with increasing scientific and technological potential. The both tasks require highly skilled personnel for their solution. The Soviet-Indian collaboration in the field of MHD-method of electrical power generation is one of the examples of the complex nature of industrialization problems. In Indian research center in the state of Tamilnadu Indian scientists with assistance from the Soviet experts from the USSR Academy of Science Institute of High Temperatures carry out research work on developing a new type of energy generators. Presently the center has at its disposal an experimental 15 MW unit. The results of the research work performed on this unit allow to proceed in the nearest future to developing power stations of the new type whose efficiency is likely to be 10%

higher than that of conventional power stations.

The complex nature of the tasks in question is also illustrated by construction of energy projects in developing countries as well as of research establishments such as, e.g. Tajura Nuclear Research Center nearby Tripoli, the capital of Libya. It is engaged in carrying out research programmes aimed at peaceful utilization of nuclear energy.

The considered examples witness also in favour of carefully calculating the demand for national personnel needed for performance of research programmes as well as calculating the increase of scientific and technological potential and energy supply as a result of labour programmes realization. The same holds right for planning of personnel training. In fact, training the national personnel is the key task for solution of the labour problem. Its complexity is reflected by the multitude of the forms of training, which include initial education system, vocational education system, higher education, various forms of upgrading the skills of the personnel in the home country and abroad, acquisition of necessary knowledge through the channels of bilateral and multilateral cooperation.

2. FIXING THE TARGETS FOR THE HUMAN RESOURCES PROGRAMMES

For this purpose at least two tasks should be solved: determination of the long-term and current targets and compiling the schemes of reaching them.

Determination of targets is largely the result of compiling national economies' development programmes. Absence of such programmes fixing the principal proportions for the national economy development may lead to a situation where labour training targets are not feasible. Determination of targets includes

specifying the list of professions (skills) needed with demand for each of them for each given period of time as well as fixing the ways of training (including skills upgrading). It is a pity, but one has to state that reaching fixed targets is hampered by the "brain drain" problem. For example, through the years 1961-1975 over 300 000 highly skilled engineers physicians and other professionals emigrated from developing into only three majour developed market economy countries. The most radical way of putting an end to such leakage would be for developed countries to refuse to accept specialists from developing countries for permanent jobs. The Soviet Union and other socialist countries make a point of following this rule. Among other measures to be taken by developing countries could be named varios incentives for national perconnel aimed at enhancing their desire to work in the local industries.

3. A PLANNED APPROACH TO THE PROBLEM OF NATIONAL HUMAN RESOURCES

Such approach to solution of human resources problem should facilitate meeting the demands of a national economy for the skilled labour. To introduce it into practice it is necessary to have a special state body and the corresponding methods of planning. Taking the demand for the highly skilled national labour for a basis one could determine a programme of establishing new education centers, training establishments for national labour with assistance from developed countries, sending national personnel abroad for education and skills upgrading. The process of planning might be envisaged as follows. The demand for national personnel is calculated on the basis of government's strategies. The latter take into account national companies' plans and local bodies' projects as well as requirements of governmental organiza-

tions. This serves as a basis for setting plans for the system of education on the whole including companies and organizations which train its personnel themselves. It is only natural that various national customs, traditions etc. should be taken into consideration while preparing such plans.

Observation of the corresponding normative documents is an essential part of the planning process. Systematical accumulation and analysis of the data on labour consumption by kinds of works is the key task in this respect as such data form the basis for adoption of labour consumption norms.

Sending local personnel for education abroad does not necessarily mean orientation only on developed countries. A considerable number of specialists from many African states received, for instance, their higher education at the Guinea Institute of Technology, which was built with assistance from the Soviet Union.

4. SETTING A REASONABLE RATIO OF THE OWN EFFORTS AND EXTERNAL AID

For the success of the development and execution of national human resources programmes it is important to fix a reasonable ratio between a country's own efforts and external aid. The former should be a prevailing component. It means having a distinct national economy development plan with clearly fixed demand for national personnel. It also includes a broad and ramified educational system, carefully planned and constantly under control. And, finally, own efforts mean having corresponding economic, organizational and legal mechanism necessary for the functioning of education system.

while the own efforts of a developing country are to prevail, one should not forget the importance of international cooperation in the field of labour education and training. The Soviet Union, for example, carries out a large-scale programme of collaboration with developing countries in education and training of local labour. The programme takes into account the requirements of their governments. Tens of thousands of Soviet specialists work for the implementation of this programme assisting developing states in realization of their industrialization plans. Such assistance includes performing design work, programming, research and development, engineering, consulting and technological services connected with execution of construction, installation and other works, actual construction of major industrial projects in developing countries, sending medicine men, teachers etc.

Soviet organizations educated about 4,000 specialists from developing countries through every possible way of vocational training. Among the various educational institutions (including those currently under construction) were established with Soviet assistance; half of them have already been put into operation.

The Soviet Union widely uses in its cooperation with developing countries such forms of national personnel training assistance in construction of educational institutions, vocational education centers, training local labour by the Soviet specialists directly in the process of constructing and operating industrial projects; receiving foreign citizens for education in the USSR, providing consulting services in the field of national economy planning, drafting development projects, certain industries, preparation and execution of various programs.

1) including experts, jobs, [illegible] democratic republic.

[illegible] local labour [illegible] in the process of [illegible] running and operating industrial projects is, from the point of view of developing countries, the most interesting form of cooperation in the field of education due to its large scale and relatively low expenditures on the part of national companies. [illegible] method was utilized for training a counterpart of local personnel of the [illegible] Hydroenergy Project in [illegible], during the construction of Bhilai and Bokaro Steel Works in India etc. Many thousands of specialists from these countries received thus their [illegible].

Depending on the nature, capacity and resources of a project various forms of training are usually used. Among them group training, individual training, training in the working [illegible] ([illegible]) as well as certain intermediate forms. [illegible] for the successful usage of [illegible] training courses, developing necessary methodol[illegible], providing [illegible] classes and their equipment, developing learner's manuals, visual aids etc. In case of necessity skilled methodologists and vocational training experts are sent to [illegible] projects in developing countries.

Extending engineering and consulting services is a particularly interesting form of national labour training. They are [illegible] with new technologies and usage of newly developed equipment, [illegible] works, [illegible] [illegible] [illegible] consulting companies, [illegible] [illegible] [illegible] [illegible]

of engineering consultancy (such companies operate in quite a number of developing countries, among them in Nigeria, Algeria, Peru etc.).

One of the higher forms of training highly skilled personnel in developing countries is establishing national design and research organizations. This is examplified by Indian MECON - a consulting company in the field of metallurgy which is a result of the Soviet-Indian cooperation. Establishing design and research organizations in developing countries is an appropriate solution for the problem of technology transfer and its repeated usage for the national and export purposes.

Usage of received technology for export purposes requires a specially trained personnel which receive both industrial (metallurgy, energy production, mining etc.) and export-oriented economic instruction. The latter includes the knowledge of national economy and the role of international cooperation in solving its tasks; knowledge of labour, financial and currency legislations and their observation in joint activities with foreign companies and organizations. The obligatory requirements include also mastering diplomatic protocol, one or several foreign languages, methods of estimating market situation and others. A special attention is nowadays paid to problems of project management in construction of large-scale industrial enterprizes which are of the key importance for industrialization of developing countries' economies. The processes of preparation, evalution and decision-making, works management in the course of project execution require the services of higly-skilled management personnel.

A significant role in providing external sources of labour is played by foreign companies. It is very often that they have considerable difficulties in mastering and observing in their activities the principal clauses of developing countries' legislations. Manuals and guides issued for the benefit of foreign companies solve this problem only partially. Developing states could make a useful step by setting a network of national consulting agencies which would undertake adaptation of the foreign companies' activities to the regulations of national legislations.

5. INTERCONNECTION BETWEEN THE NATIONAL AND INTERNATIONAL AIMS AND THE COMPANY TARGETS

Coordination of the activities of the state firms, private companies and state bodies is the basis for solution of labour problem on the national scale. The issues of target and planning strategies are the key ones for solution of labour problem. A problem of receiving and passing further the knowledge aquired by a company is no less important. It is necessary that the experience gained by a company as a result of its own activities or through cooperation with companies from developed countries, should become a national property. Such experience concerns usually the following main fields:

- technological
- economic
- organizational
- legal.

The technological part is the one that draws the main attention. It includes design documentation, equipment, buildings

and constructions (in case of industrial projects), testing methods, control procedures, operation manuals. Despite the undisputed importance of the above-mentioned, the technological part of the gained experience may be useful only for application in the same or neighbouring industry.

The other three parts are of the universal nature and may be used in any industry. Utilizing the gained experience in execution of new projects, specialists from developing states should take into consideration the following economic issues: a system of economic indices used by a partner from developed country and methods of using them; generalized indices and criteria for coordination of the parties' activities; a system of scheduling for the purposes of long-term and current planning and everyday management; a system of incentives and sanctions; methods of determining norms and using them for complex estimations (materials expenditure, labour consumption, work duration etc.).

A proper arrangement of works performance is one of the decisive factors of increasing the technological level. This means that the local personnel should thoroughly study work arrangement methods employed by their partners from developed countries including provision of main types of resources, materials etc. Determination of works' sequence, studying the causes of negative and positive influences on the works progress and fixing approximate quantitative estimation of these influences are the basic issues which the local personnel should pay its attention to.

An experience of solving legal problems may be accumulated by studying the legal clauses of commercial transactions,

business that are complied in the process of project execution, practice of settling disputes.

Studying the practical experience of certain companies and exchange of the results of such studies is one of the important ways of upgrading skills of the national personnel. It is worth mentioning that this doesn't require additional expenditures. Information exchange on the gained experience might be performed between organizations from various developing countries. It would facilitate the development of international cooperation between developing countries, as was pointed out at the conference of non-aligned countries in New-Delhi in February 1981.

Another issue which influences the interconnection between tasks of certain companies and the state targets is provision of planned solution of the labour problem. This mainly concerns those countries that have excessive labour resources. Building production of a certain kind of product requires a certain corresponding number of workers and managers.

Industrialization of economy demands new investments which are distributed through a definite period of time. The initial stages require only a limited number of workers which grows while the project develops and decreases by the time of its completion. Such variations of demand for labour could be regulated by way of executing several projects simultaneously which differ by moments of their start. This kind of [illegible] will also [illegible] project companies. [illegible] on the national economy on the whole [illegible] might be utilized by the government bodies in collaboration with local administration. It could also be carried out [illegible] national scale. [illegible]

ing economic cooperation between the neighbouring countries.

Usage of the experience of solving the labour problem in other states including the socialist countries is one of the tools of international cooperation. Mongolia could be one of the sources of such experience. This formerly underdeveloped state is becoming a developed agro-industrial economy and all the changes occur in what is considered to be a very short period of time from the point of view of man's history. About 47000 highly skilled workers were trained through various forms of vocational education only through the years 1976-1980. Other countries also possess a useful experience in this field.

Coordinated application of the above mentioned principles of the complex and planned approach, orientation on targets, maintaining the reasonable ratio between own efforts and external aid, observing the national and international aims of cooperation is a radical way of solving the [illegible] in the process of economy industrialization in developing states.