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GROUP N

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Professional help in Agricultural Sciences and Economics and Interchanges between Educational Institutions

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MR. VIRONE'S paper on 'Raising the Rate of Economic Growth in Low Income Economies by increasing Provision of 'Newer' Factors of Production' has highlighted the role that agricultural sciences and economics can play in increasing the provision of 'newer' factors of production. Even the promotion of intensive use of 'traditional' factors of production and their adaptation to new environments require considerable adaptive research and professional help, especially if the gestation period is to be shortened. Development of 'newer' factors of production and their introduction and intensive use require both fundamental and applied research and a great deal of professional assistance. Adaptation of 'traditional' factors to new environments as well as development and introduction of 'newer' factors are largely influenced by technical and socio-economic considerations. There is, therefore, need for research not only in technical aspects but also in economic and social aspects.

Unfortunately, in many of the developing countries, facilities for such research and extension of the research findings do not exist, or even if they exist they are extremely inadequate. There is a great need for providing professional help not only in agricultural sciences but also in economics and sociology in most of these countries. There have been many cases where desirable technological improvements were not adopted because economic and social factors were not taken care of; problems of motivations are no less important than those of technology.

Even in those developing countries where certain research, training, and extension facilities have been developed, these tend to be concentrated in a few regions and benefit only a fraction of the farming population. It is almost a universal proposition that the more there is need for professional help in agricultural sciences and economics among different classes of farmers in different developing countries, the greater is the lag in it. In some of these countries the difference between the elite and the common people is so great that the research work which interests the former turns out to be too remote from the needs of the latter.

At the same time, wherever it has been possible to break these barriers, the research input has produced output which has been far out of proportion compared to the former. It has been the experience of most countries that the inputs in terms of scientific research and extension are even more important in the long run than material inputs. For instance, it has been estimated that each dollar invested in the development of hybrid maize has yielded over 700 per cent return to the U.S. society. To give another example, between 1880 and 1938 agricultural production in Japan rose by 150 per cent while material inputs rose by only 30 per cent. This trend has been not only maintained but even improved upon in recent years.

Professional help in agricultural sciences and economics is, however, required at different levels and has to be of different degrees of sophistication. It must be of one kind for the extension worker whose clients are mostly subsistence farmers and of a different kind for agricultural experts who advise the progressive farmers producing for the market and aware of the importance of new technology. It has again to be different for the research and training institutes which cater for the needs of these personnel. It has to be at an even higher level of sophistication for policy and planning requirements at the national level. What is good enough for one country at a particular stage of development may not be good enough for another country or even the same country at a higher stage of development. Further, professional help required for training and extension is of one kind while that required for research is of a different kind although there has necessarily to be a very close link between the two.

In recent years, professional help in the fields of agricultural sciences and economics available in developing countries has been increasingly supplemented by assistance from abroad either through international agencies or through bilateral technical assistance programmes. Considerable experience in this regard has accumulated both within the participant countries and in the international agencies.

In certain cases it has led to very encouraging results. The work done, say, in Mexico on wheat or in the Philippines on rice, has benefitted farmers not only in these countries but also in a number of other developing countries. A large number of experts recruited under national as well as international programmes has helped to improve the level of agricultural technology in many a developing country.

Unfortunately, in spite of the support that it has received and the enthusiasm that it has evoked, the progress has been much slower than expected and the results are not commensurate with the efforts made. One reason, of course, is that the inhibiting factors have been induly strong in comparison with the resources that could be brought to bear upon them. A more massive and planned effort is needed if these difficulties are to be effectively overcome. A second reason is the lack of proper understanding of the special problems of different regions or of different classes of farmers and a tendency to follow the easy path of prescribing standard remedies. A third reason is the absence of adequate 'feed back' arrangements between the field and the research or training institutes which

has tended to dissipate many of the benefits which could otherwise follow. Fourthly, the requisite balance between the pressures of the present and the needs of the future has not often been maintained. In many of the developing countries, the policy makers have been so pre-occupied with so-called 'crash programmes' to deal with some current difficulties that they have often given low priority to research. On the other hand, the research workers have found the current environment so discouraging that they have tended to retire to 'ivory towers'. Fifthly, there is inadequate inter-disciplinary approach in agricultural research and programming. It is not always appreciated, especially in a number of developing countries, that there is a much greater need for an inter-disciplinary approach in the agricultural field than in many others. In the absence of an appropriate inter-disciplinary approach, the results produced by the experts have not been commensurate with their efforts.

However, as a result of the experience of the last two decades or so, there is now much greater awareness of these problems among both policy makers and scientists. For instance, an increasing attempt is now being made to make agricultural experts work in teams rather than in isolation. But even now, agricultural economics is not being adequately integrated with agricultural technology. Problems of cross-cultural communication are not being paid sufficient attention. Knowledge of the experts in the field is not adequately 'fed back' to the scientists in the research institutes and vice versa. There is inadequate arrangement for cross-fertilization of ideas and experiences. There is a common complaint, even in a country like the U.S.A., which has such a large and varied experience of agricultural, economic, and sociological research, that the experience of the field-workers is not made proper use of by the research and training institutions. Research is carried out in the environments of developed countries or in developed areas in developing countries and then transmission to under-developed areas without proper adaptation is attempted.

Usual bureaucratic methods of working have often been found responsible for these shortcomings and an attempt has been made in recent years to set up 'sisterhood' relations, as they are often called, between universities or research institutes in developed countries and their counterparts in developing countries. This has, no doubt, helped to correct some of the lacunae in certain cases but there are still many deficiencies. The regular faculty has not been intimately involved in the technical assistance programme. The technical assistance staff has been recruited largely on *ad hoc* basis and when their contract was over the experience gathered by them was lost to the parent institute. The field visits of the members of the regular staff have been few and far between and unduly short to be of any real advantage. A feeling has, therefore, been gaining ground that it is the regular staff members who should be used for technical assistance programme rather than *ad hoc* recruits. The latter should be used to fill the temporary vacancies of the former instead of the other way as at present. Another suggestion made is that instead of setting up research and

training facilities for developing countries in the developed countries, such facilities should be set up in some selected developing countries.

The problems are thus fairly well identified now and the solutions are also not unknown. What is needed is to bring these together in a programme of action and make an all-round effort to get this programme accepted by the policy-makers, administrators, and scientists concerned at different levels.

In the first place, it is important to emphasize that much greater resources have to be provided for professional help in agricultural sciences, economics, and sociology than has been done hitherto at different levels both in developed and developing countries if a real impact is to be produced on the various inhibiting factors.

Secondly, a chain of institutions has to be appropriately organized right from the universities and research organizations in developed countries down not only to their counterparts in developing countries but also from the latter to the regional research units and training and extension agencies at the regional and development block levels.

Thirdly, provision has to be made for locating teams of experts with different technical background at each level, having the requisite degree of sophistication needed at that level for different stages of development. While individual experts may have their use in special cases it is the team approach which is likely to yield the best results on the whole.

Fourthly, there should be adequate arrangements for frequent visits and interchange of experts between institutes at one level and those at levels immediately above and below it.

The whole approach to the problem of professional help in agricultural science and economics has to be one of what may be called 'successive sophistication'. The technical sophistication needed at each level should be carefully assessed and the professional experts assigned for these levels selected accordingly. This assessment should be carried out periodically both in respect of the region which these institutes cater for and the experts. As soon as a region develops from one stage of sophistication to the next higher stage, arrangement should be made to replace the existing experts with experts suited to the new level. The existing experts of the lower level of sophistication may be transferred, after giving them the needed reorientation, to another region where their expertise will be more appropriate. It is often found that experts from one underdeveloped region turn out to be more useful in another underdeveloped region than an expert from a highly developed region; although at the research level close liaison with the worker from the developed country may be highly stimulating and helpful.

What has been said above points to a personnel and financing policy within both the developing countries and the developed countries and international agencies which has to be substantially different from the present and much better co-ordinated. It would be useful if at the regional level, the country level, and also at the international level there were small co-ordinating committees to review the personal and financing policies from time to time and bring about the needed co-ordination and adjust-

ment. These committees could also look into the systems of communication which may obtain between different levels and make a special effort to improve this system periodically. The new techniques of communication which modern science is making available to us could also be pressed into the service of agriculture by these committees. They should also made arrangements for a systematic collection, analysis, and dissemination of the experiences of field-workers, especially at the regional levels.

Except at the lowest level, viz. the village level, it is important that common research and extension centres should be developed at different levels, e.g. the blocks, districts, universities, and national institutes within developing countries. For isolated experts often get lost and their impact on policy and programmes also tend to be much less effective than they could otherwise be. Further, if there is a centre or a sort of campus, say, at the block level or district level, the inter-disciplinary approach is encouraged and there is a greater cross-fertilization of ideas. Also, it becomes more convenient to provide common facilities and the requisite amenities which will attract professional people of the right calibre. If such a Centre or Campus exists in a block or district when that block or district reaches a higher level of development, it becomes easier to bring about the institutional changes and also replace the personnel in a planned manner when necessary.

The existence of (i) a common service or cadre or (ii) a flexible and co-operative policy of secondment with leave being given for sufficiently long periods to the experts concerned or (iii) even a system of provident fund and other retirement benefits which an expert can carry when he moves from one Centre to another from one level to another, will go a long way to facilitate the implementation of such a policy of successive sophistication.

Finally, this arrangement has to be supplemented by an effective policy for providing in-service training, refresher courses, and other facilities for improving the quality and sophistication of the research and training personnel. Such training facilities have to be both concurrent and periodical. It is a mistake to think that they are needed only by junior personnel. Technical experts even at the highest levels tend to benefit considerably if they are given opportunities for refresher courses, especially in institutions other than their own, at intervals of, say, three to five years. An imaginative programme of fellowships and research and training grants could go a long way in improving the quality of most of the professional cadres in developing countries.

GROUP N. REPORT

It was the general view of the participants that foreign technicians need time enough to get acquainted with the country and its people before starting to give advice. Further, in order for any programme of technical assistance for developing research in agricultural services and economics to be successful, it is necessary to give continuity to the programme.

There was general support for the view that foreign advisers should

spend some time in teaching. In this way their contribution to the country could be greater than if they only study a given problem and write a report. The view was expressed, too, that what is needed in the less-developed countries is to promote institutional change and usually the American universities cannot provide this kind of service because of the lack of experience in this field.

Institutions of any kind, if they have any foundation at all, are always founded on ideas. In the, so called, Western world such institutions as colleges of agriculture, experiment stations, and extension services are firmly rooted in an idea that is indigenous to that society in respect to the usefulness of science in production and living. This idea is that principles can be discovered through systematic study of the real world and environment, and that these principles, when understood, can then be re-applied in the real world so as to improve it for human purposes.

The task of so called Western experts going abroad to help their friends in other civilizations to make a more productive use of sciences is thus to convey to students and colleagues what is, in effect, a completely new way of thinking, a philosophy of science, and an attitude of the scientist towards the farmer and the student.

The view was expressed that one of the greatest errors of policy made by U.S. International Co-operation Administration and its predecessor and successor agencies has been to prohibit or inhibit the teaching of students by their visiting experts. In teaching, such experts can plant in the still-open minds of students the very roots of science. Up until then students will probably have been taught only to memorize and not to think at all in the scientific sense. Thus the task of conveying a philosophy is deep and difficult and requires a different and a better education of ourselves as experts and teachers as well as of our friends in other lands.

Academic professors in developing countries often have little opportunity to do research. Their students would thus receive knowledge mostly from research done in other lands. Those returning after studying in American or European universities may have no opportunities to work in any field where they can use their training. Public institutions are involved in 'brush fire' activities without time to do research. One contribution towards a solution might be to create research institutions within the universities, which could use the services of the professors in doing part-time or full-time research in interdisciplinary projects producing research material to be used by public and private institutions and also in teaching. Foreign experts could contribute with their knowledge through these research institutions.

Dr. Sen urged the importance of informing the international agencies and governments of the need to follow the ideas expressed by the group.

One contribution stressed that it was not the prejudice of the economist which moved him to say that it is on the side of the technical sciences where a greater effort ought to be made to carry out an interdisciplinary 'saturation'. Consultations at various universities gave him the impression that in educational materials assigned to students of agronomy, animal

science, etc. the economic implications of the different processes, of physical-chemical-biological characteristics, were less emphasized than were technical-biological problems in materials assigned to students of farm management.

Another stressed that an advance in the field of inter-disciplinary saturation affects production with a considerable lag but rather intensely: the mass of young people will enter into production with a more adequate image of their field of activity. A quicker effect on the farmer may be produced if we change the thinking of the extension agents.

The teachers of professional secondary schools had seldom been mentioned although their role is by no means negligible. Among those who registered in refresher courses in Hungary for managers of large-scale farms, there were usually a few of such teachers, mainly management teachers. Four years' teaching and examinations showed that they learned mathematics more quickly than farm managers, agronomists, and other people from the fields, but they lost ground more often than these latter when it came to solve some practical (economic) problem by using calculus or matrix operations. Their thinking seemed to be less flexible, their mind less open to the economic reasoning behind the mathematicians than that of those who had regularly been exposed to decision-making (even if only in technical problems). Some retraining of teachers in vocational secondary schools should not be neglected considering their influence on whole sections of those in farming.

Among those who contributed to this report in addition to the opening speaker were: Edgar Thomas *U.K.*, R. C. Manning *Peru-U.S.A.*, A. B. Lewis *Taiwan-U.S.A.*, J. B. Wyckoff *U.S.A.*, J. L. Mellor *U.S.A.*, G. W. Edwards *Australia*, C. C. Malorie *India-U.S.A.*, E. W. Owens *U.S.A.*, N. Westermarck *Finland*, L. J. Paz *Peru*, J. R. Raeburn *U.K.* A note was subsequently received from J. Sebestyen *Hungary*.