

APPROPRIATE/INTERMEDIATE FOOD TECHNOLOGY— HOW NOT TO DO IT: A VIEW FROM THE THIRD WORLD

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□ MANY LESS DEVELOPED COUNTRIES (LDCs) now realize that their economics can no longer support capital intensive western technologies which co-exist with their traditional technologies. Since there can be no meaningful development based on traditional technologies alone the suggestion has been made and projects are underway in various LDCs to develop technologies midway between the two which are compatible with the LDCs human and material resources and cultural values.

The new technologies being developed are variously described as appropriate, intermediate, adaptive, etc. The problem has been approached from several angles by various interested organizations and it is the aim of this paper to discuss some of these approaches, and where possible to offer some suggestions. Since food production relates to food processing, I may also refer in this discussion to general agriculture.

DEFINITION OF AIFT

The terms Intermediate or Appropriate Food Technology are used interchangeably in the literature. The term Adaptive Food Technology has been defined in the literature to mean the modification by scaling down of existing large sophisticated machines and processes to smaller, cheaper and simpler products and methods.

Clearly this definition looks at the problem from the top downwards, but from the viewpoint of the LDCs, the problem has to be viewed from the bottom upwards. The latter view means the modification by upgrading or scaling upwards existing simple traditional machines and processes to more sophisticated machines and processes to improve production efficiency.

Intermediate technology on the other hand, is defined by Askin (1975), to refer to products and processes which in scale, simplicity, accessibility and productivity lie somewhere between existing primitive and advance technologies, but which are closer to the former than to the latter on the spectrum of probabilities.

The intermediate nature of either Appropriate or Adaptive Technology cannot be denied nor the appropriateness of any innovation be disputed. Hence instead of talking separately of Appropriate, Adaptive or Intermediate Food Technology, we should talk more of Appropriate Intermediate Food Technology (AIFT) which should be defined as the application of modern science and engineering ideas to upgrade traditional or simplify sophisticated food processes and machines in a way compatible with the educational, economic, cultural and social needs of LDCs.

AREAS OF APPLICATION

The question may be debated as to which economic sector AIFT is more suited for application—the traditional (non-modern) or the urban (modern) sector? On its face value, since AIFT springs basically from the need to increase employment in rural areas to halt urban migration for jobs and to decrease income disparities, it appears it should be limited to the rural or the traditional sector. But the economic growth of a country cannot be placed on small

scale rural economic activities alone. However, since the idea of AIFT is also to save scarce foreign exchange by substituting local materials and ingenuity, the modern sector may benefit by exposure to it. To avoid conflict between the modern and traditional sectors in the application of AIFT it may be necessary to delineate specific areas of activity where either may be encouraged.

For example, rural AIFT could concentrate on improvements in simple food processing equipment and methods such as vegetable pressing, and processing of food grains.

Urban AIFT on the other hand, could simplify modern technology or redesign traditional technology in such areas as food preservation and processing, sugar refining, and oil refining. Urban AIFT could also introduce new technologies into these areas.

CHOOSING AN AIFT PROJECT

An AIFT selected for development must not be that whose gains are restricted to only a few large processors or entrepreneurs. Instead it must be that whose gains will have spin-off value in the community at large. To spread the benefits of the AIFT in the rural setting for example attention may be directed to the development of simple food processing equipment whose repair will be in the hands of local craftsmen such as blacksmiths, wayside fitters and welders.

The selected AIFT must also have a high demand, acceptance or marketable value and in this context existing successful rural industries give a good guide to selection. These criteria ensure that selected AIFT will be commercially viable. Other important variables in the selection equation which must not be overlooked are cultural values, traditional practices and social customs. These have contributed to, for instance, the Javanese continued use of the much slower *ani-ani* knife instead of the faster and simpler sickle to harvest his rice and also to the Ghanaian's refusal to eat improved smoked fish with intact head but with the eyes removed.

In talking of AIFT we must not leave out the source of raw materials. Scarcity of local raw materials plagues most food industries in LDCs. This is caused primarily by the drudgery involved in unproductive traditional farming methods quite unsuited to modern requirements. The amount of hard jungle clearing necessary in farming is found to be more than a farm family can handle with farm labor and traditional tools. Therefore Indonesian farmers are now turning their backs against tradition in favor of AIT involving the adoption of small scale mechanical equipment.

Similarly for this reason Phillipinos now reject their traditional carabao (water buffalo driven implements) "because the carabao is too much work" (Askin, 1975). There is an urgent need for Appropriate Intermediate Technology (AIT) to take drudgery out of traditional farming methods and practices to increase raw material supplies for food industries.

Under a climate of raw material scarcity, priority in AIFT development is given in Ghana to those projects that produce basic raw materials for industry or which make use of local and or previously unused resources. Such projects receive better government support or preferential treatment if they also fall within a national priority area. This latter criterion is particularly important when a project involves the participation of a government department.

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HOW AIT AGENCIES OPERATE

The forms of AIT technical assistance operating in LDCs vary from by-mail technical assistance by overseas volunteer consultants, through institutional building, to the support and sponsorship of specific research at recognized research institutions, universities and government departments.

Taking the by-mail approach, experience from the field shows that it is not sufficient in rural settings to put a client into contact with a consultant by mail. Our experience shows that it requires the active supervision of the consultant to ensure that the client implements his recommendations fully. In the by-mail approach the client may have the benefit of on-site visit or supervision if he can provide a return fare and other expenses to the consultant. One can imagine the expenses that the rural processor or farmer in Indonesia will face in sponsoring a consultant from Philadelphia!

The need to take account of local factors requires that research planning, participation and decision-making with respect to a project does not take place in a foreign country. On the contrary, it requires that these activities take place in or near the problem area to take advantage of the advice, concerns and reports of the local people for whom the gains are intended. This ensures that the AIFT for an area is based on a true understanding of the economic, social, and other forces that may promote or hamper any development effort. This is likely to be successfully aided by local counterparts who know and understand the social, cultural and economic needs of the community and indeed have a better understanding of the perception of its problems and desires. This new approach requires therefore a change in the nature of the inputs (material and human) and the way technical assistance programs and projects are traditionally designed and managed in favor of greater reliance on local institutions and personnel.

WHY PROJECTS FAIL

Traditionally in the past where the local institutions were ill prepared for an AIFT project the donor organization or government had laid greater emphasis on the recruitment of expatriate technical men and specialists needed for the job with the recruitment of a few local men as assistants to the professionals without making proper provision for their training to take over the professional duties after the expatriates have left. It is our belief that this is wrong; where local skills cannot support a given level of technology in the context of AIFT it should be considered non-viable because the technology will have no continuity. In this respect it requires either a scaling down to lower levels of technology appropriate to the skills of the locality or alternatively the project should provide for the training of indigenous personnel in appropriate technical and managerial skills preparatory to starting the project.

The practical training of a student for an AIFT project must also not be insulated from the problems of his community but must instead reflect post graduation problems at home. The student must also be encouraged to use, while in training, equipment likely to be available to him. Such practical approach helps the trainee to become more effective in adjusting his thinking skills to extract the best from the new and the best from the old in developing something more appropriate for the utilization of local resources.

Failures of some AIFT projects may also stem from the type of administrative structure imposed upon them. Some AIFT technical assistance projects are found to be saddled with a chain of large controlling administrative committees whose membership is so large and diverse as to make their

work almost impossible. Naturally, pressures in the separate departments of members take precedence over those of the project and summoning meetings to discuss issues affecting the project often becomes difficult. The net result is non-action or unnecessary delays in making policy decisions resulting in much frustration among participating scientists.

We know that the offer of many technical assistance programs are politically motivated and the composition of some of these administrative committees is similarly motivated. We suggest that there is a need to contract such technical assistance directly to appropriate national research and university institutions and departments, and thus simplify their administration to increase the chance of success.

HOW TO EXTEND AIFT RESULTS

A number of very good projects are known to have been completed with good results without making any impact on the people for whom they were intended. This situation is blamed partly on economic constraints and partly on a communication gap between laboratory and beneficiaries (Youngs, 1974). However, where both communication and economic constraints have been taken care of we still find cases of non-impact. It is clear from this discussion that factors other than economics and communication gap are involved. It is known for instance that it is not sufficient to let beneficiaries know of the end product of research. We now realize that the hopes, aspirations, skills, attitudes, resources, services of the area have to be considered in the initial planning, management and execution of the project for a successful extension. It should be clear from this that when a project is properly planned with due consideration of the local clients, extension of the resulting product should offer no problems.

CRITERIA FOR SUCCESS

Central to the concept of AIT is the existence of abundant cheap labor. AIT operations and designs are therefore characterized by their labor intensiveness. A critical appraisal of existing LDC labor markets indicates that labor is neither abundant nor cheap as is generally believed. In the LDCs labor is generally overpriced relative to its abundance by artificially high minimum wages. There is usually, because of politics, no distinction between skills that are in high demand and low demand. Hence, the rural enterprise may have to pay as much as in urban industry.

These factors may contribute to products from AIFT projects costing relatively more than expected. However, viewed from the fact that some LDCs are adopting rigid import restriction policies products turned out by AIFT—even if unit prices are relatively expensive—may make a big difference between having the item and not having the item. Thus, taking account of local situations the ability of a chosen AIFT to make available goods and services needed in the rural community, from local resources, and also create employment opportunities should constitute the criteria for success.

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