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**LABOUR-RELATED ISSUES:
AN ASSESSMENT WITH RESPECT TO
AGRICULTURAL RESEARCH IN THE MIDDLE EAST
AND NORTH AFRICA**

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Introduction

This is a position paper with which we wish to initiate discussion on the relationship between labour problems and agricultural research in the Middle East and North Africa. We hope that this discussion will stimulate and give direction to research.

We are looking at labour issues with the special focus of relevance to agricultural research. Recent developments in agricultural research involve a systems or, more specifically a farming systems approach. This approach has a broad and usually multidisciplinary view of agricultural problems. Such a perspective requires that attention be paid to labour related issues in agriculture and also emphasize the ramifications of the developments in the non-farm sector. This latter part has not been adequately treated in agricultural research. In this paper we intend to put forth a frame in which labour related issues can be addressed with such a perspective. The discussion is based on our own experiences¹ as well as insights provided by the recent literature in the field.

¹/ Our combined experiences involve research activities in Jordan, the Sudan, Syria and Turkey.

We will confine ourselves to the Middle East and North Africa. This is for several reasons: first, the area is characterized by inadequate food production, a problem which is addressed with diverse policies that have had varying success in the different countries of the region. Second, as we will try to discuss in detail, the region is characterized by particular labour related issues that impinge on agricultural production. These issues originate and are finally equilibrated within the region, therefore the region is an appropriate unit of analysis. In addition to these characteristics common cultural and linguistic bonds within the region can reinforce the definition of this unit of analysis.

The Farming Systems Approach and Agricultural Labour

Technological change in agriculture both of the "mechanization" kind and the "green revolution" kind has been criticized as having a multitude of first, second, etc. generation adverse effects. Even though part of this criticism does not appear to be justified and well founded, some adverse effects of technological change in agriculture appears to be a reality. Part of the causes for this can be attributed to research on and design of technologies inappropriate to farmer conditions.

Realisation of these problems has caused the gradual evolution of the "farming systems" approach in agricultural research. FSR (farming systems research) has been discussed adequately and in detail elsewhere. The basic characteristic of this approach is to thoroughly assess conditions in a multi and inter-disciplinary manner in order to develop appropriate technologies that are also socially acceptable. Such an approach enhances the rate of adoption and diffusion of the developed technologies.

Within FSR, if a new technique or crop is introduced, efforts are made to ensure that conflicts in production cycles are minimized. For example, care is exercised to ensure that a new crop's harvest does not coincide with peak labour demands of other crops.

It is with this perspective that we feel agricultural labour problems need to be assessed in the Middle East and North Africa. FSR takes into consideration the resource constraints of farmers and their attitudes towards risk, subsistence and income generating activities. Agricultural labour has to be viewed in a similar manner as one, if not the most crucial, resource of the farm.

The management of the labour resources of farms in the Middle East and North Africa pose particularly challenging problems. It has the following general characteristics:

1. Most of the agricultural production is concentrated in irrigated areas. These areas are limited in their labour absorptive capacity except in peak seasons for cultivation and harvesting of the industrial crops or fruits and vegetables concentrated in such irrigated lands.
2. Rainfed agriculture in the region is characterised by stagnant and in some areas declining long run average yields and a high level of variation in yields due to climatic variation, especially rainfall. These rainfed areas are allocated primarily to two cereals, wheat and barley. The former is the basic staple crop and the latter is the basic feed crop of the region. With population growth the stagnant and declining yields have inevitably reduced the income generating capacity of farming for the rural families. This has caused such families to allocate part of their resources (primarily labour) to off-farm and primarily non-agricultural activities.
3. The region has metropolitan centers which can accomodate seasonal or permanent labour from the rural areas. But, the region is more typically characterized by having three centers which have attracted labour from rural areas:

- a. Europe has traditionally attracted labour from the Levant and North Africa. This venue has been quite restricted in the recent past.
- b. North African petroleum generated activities have attracted labour primarily to Libya.
- c. The most important area which has attracted labour due to petroleum generated activities is the Gulf region.

A common language, similar cultural traits and possibility of virtually unrestricted movement has allowed a high level of physical mobility for labour in the Middle East and North Africa.

As much as it is necessary for FSR to assess the labour situation in given location-specific micro situation, it is as important to assess the broader labour related issues in the region. This is necessary in order to develop the foundation of a general research policy, especially for FSR directed at rainfed areas. The basic tenet of such a policy is to develop guidelines in designing technologies with adequate consideration of the labour related issues. The basic principle is to develop technologies that will smoothly allow an adaptive process to improve agricultural production rather than technologies that enter the system as a disruptive shock.

It is thus necessary to develop a research agenda which will assess existing conditions and projected developments in the allocation of the labour resources of rural households in the Middle East and North Africa region. Within this frame, it is not only necessary to analyse the allocation of labour to on-farm and off-farm agricultural labour and off-farm non-agricultural labour but also to assess the much neglected role of women and children in the labour processes of the rural farm-household.

In the following sections, we shall try to present a background discussion for approaching labour related issues in agricultural research.

Labour Management in Rural Farm-Households

Issues related to agricultural labour in the Middle East and North Africa region can be approached from the point of two interrelated spheres:

- a. Developments in agriculture.
- b. Developments outside agriculture that impinge on agriculture.

First we will present a schematic discussion of the developments in agriculture. Assuming that at a point in time agricultural production is in an equilibrium, a new crop or technology which requires the application of additional labour time to some of the activities will introduce a shock to the system. Such a shock would come about through

- a. New activities, e.g. use of fertilizer in a previously unfertilized crop.
- b. Increase in the intensity of activities, e.g. increased number of cultivation or weeding.
- c. Higher yields which may cause higher harvest, threshing and storage requirements.

It is possible for some of these changes to cause capital substitution which will subsequently be discussed. As far as agricultural labour is concerned, if the shock introduced by technological change is substantial then labour procurement and organization becomes a major variable to be reckoned with. This is because labour markets do not operate as most other markets do where demand and supply are smoothly equilibrated and an equilibrium price is established. Greater planning and communication is needed than that is available through an impersonal market mechanism.

To be more specific, when in a region labour demand increases for a specific activity lasting for a fraction of a season, the only workers eligible are those who have alternative income sources but are not involved in those activities during this period of high labour demand. In other words, farmers

would be demanding seasonal workers only for a specific task and for a limited duration. By definition, such workers will not be those who are continuously employed as wage workers in other occupations because it would be hard for them to find adequate wage work which would be complementary (in terms of labour demand) with other agricultural activities. Hence, labour will be supplied by either the landless poor or by the landed cultivators who are free at the period of increased labour demand. Conceptually, such labour complementarity is rather common between dryland grain harvest and cotton harvest and/or weeding activities. If the prospective labourers who are to be free at times of increased demand live in proximate areas, a labour market that functions normally can be hypothesized. But when seasonal labourers need to come from long distances, such a hypothesis would not hold due to two interrelated reasons:

1. A "job search" process during a short period (e.g. 2-3 months) would be too costly a process for workers. Furthermore, if the risks associated with failure to find a job are reflected onto the wages, then such labour costs would be too prohibitive for the farmer.
2. Appropriate incentives and information would be necessary to coax prospective labourers who do not normally participate in the labour market. They may be self-employed and/or averse to the risks of the seasonal "job research".

In fact, this is exactly what happens. The structure of labour markets for peak demand periods has two parts. One part is the spontaneous labour market of the community and the other is the organized and well institutionalized migrant labour pool. (That is, of course, unless a sizable stock of unemployed workers already exists in the community which is quite unlikely the framework of the Middle Eastern agricultural structure.)

The institutionalized component is characterized in the function of intermediaries (elci in Turkey, mu'alleem in Syria, qabran in Tunisia and the recruitment stations of the major irrigation schemes in the Sudan) who contract labour from large areas, transport them and supply them to farmers in another area. It is possible for labour from one village to work on the same farmer's fields every year.

The enhanced labour demand need not be made up only through migration. Greater labour participation within the community could also meet such demand but this would not be automatic. Greater participation needs to be considered in a dynamic framework. Let us start from the initial equilibrium situation where there are no surplus labourers to fully meet the peak season labour requirements. If adequate numbers of migrant workers are not available within reasonably short distances, given the harshness and drudgery of agricultural labour, significant incentives may be a requisite for increasing the participation of locals.

If there are differences in living standards and social status among the population in the region, e.g. landed and landless categories, then those towards the lower end of the social scale may increase their labour supply. However, the degree of social differentiation would be small where small peasant holdings dominate. In this case, additional labour time would be provided by members of the farm household. Furthermore, the most significant contribution to the labour supply would be made by a higher participation rate by women and children, where this is culturally acceptable and, of course, at a low enough level to be increased.

In this framework, in addition to cultural constraints, it is necessary to consider how domestic work will be reorganized in order to release the potential female labour force. The response of the potential labour supply in this case can not be taken as an on-again off-again response to changes in wage rates only. Rather, it is a gradual and adaptive change in response to new demands and income sources.

The contribution of children to agricultural work can also be treated in the same manner. In this case, the most important constraint may be schooling. Farming communities plan school years so as not to coincide with periods of peak labour demand. However, a shock to the system, creating an inconveniently spaced peak labour demand with respect to school schedules may create its own constraints.

The Process of Adapting to New Peaks in Labour Demand

The immediate response to new labour requirements would be to locally organize in order to procure the deficit labour through linkages with prospective labour supply regions. Experience indicates that the linkages between labour deficit regions and sources of labour supply are primarily institutional in character and long lasting rather than spontaneous and random. These institutional linkages exist not only among regions but also between individual agricultural workers and employers who maintain their employment connections for extended periods. The established pattern is usually such that agricultural workers go to specific farms with pre-arranged contracts. The costs of establishing connections and instituting a contract are invariably borne by the cultivators. The security of provision of labour at times of peak demand involves a cost early in the cropping cycle both in the form of advances and communication costs. This effectively excludes farmers without adequate endowments with which to bear such costs. Furthermore, small farmers with a deficit in household labour may command adequate resources but may not be able to establish a seasonal labour contract independently because they do not cultivate large enough an area to attract a minimum sized gang of seasonal agricultural workers. In that case, joint action by a group of small farmers would be necessary to make a contract with a team of workers. This process requires a new organization within the farming community.

Therefore, labour utilization is constrained by financial endowments and farm size in addition to family labour supply. In the case of small farmers with inadequate labour endowments, labour exchange relations between cultivator families may be necessary. Costs and inflexibilities inherent in these social conditions and processes may easily create constraints in the adoption of new technologies and crops by individual farming units. Therefore, the development of technologies appropriate to farmer conditions will need to include a thorough assessment of labour conditions and practices. It will also be necessary to assess the elasticity of response of the social structure to the new needs when a new technology is introduced into the system. For example, while seasonal migration may make up for deficits in the short run, social adaptation leading to greater labour participation by locals and prospects of in-migration to the area by the landless from another region may present a different configuration of labour in the long run. In this respect, within a region diversification into different crops with staggered peak labour demands may induce permanent migration of agricultural labourers into the region or may dissuade out-migration by making employment in agriculture possible for longer time periods.

As a consequence, adoption of new techniques or crops with higher labour demand may be possible for smaller farms only after the labour supply to the region is maintained. As stated above, such small farms have problems of obtaining small numbers of workers and/or workers for short duration compatible with the scale of their operations. The maintenance of a stable labour supply which is divisible to a level compatible with small farmer needs will take time. It is clear that greater numbers of migrant workers are more divisible than smaller numbers of migrant workers and locally resident labour is more divisible than migrant labour.

The Introduction of Capital Equipment

It is entirely possible for capital substitution to take place when the increased demand for peak labour is not adequately met.

The introduction of capital equipment into agriculture can take place in two ways:

- a. Capital using techniques that are complementary to labour processes (e.g. chemical fertilizers, HYV, etc.).
- b. Capital substitution, i.e. labour saving technologies (mostly machinery and equipment).

A fallacy that one should not fall into is that capital substitution, i.e. labour saving technology may not be applicable on smaller farms. It is true that in the light of the arguments in the previous sections of this paper, the introduction of labour saving technology would be most appropriate for larger farms with higher unit labour costs. The adoption of such technologies may not be feasible in smaller farms due to lack of complementarity with the household labour supply. The social repercussions of a technology replacing household labour may be considerable. However, from the point of view of the individual households, there may be advantages to utilizing capital intensive techniques. Several examples can be given in this respect from the Middle East. One should however, distinguish between two kinds of smaller farms:

- a. Those farms who are so small or divided into so many small parcels or are on such slopy or stony lands that it is technically and physically not possible to use heavy machinery such as tractor drawn equipment on them.
- b. Those farms which are so small that investment in capital equipment may not economically be rational but which are of an adequate size to technically allow the use of machinery, especially tractor drawn equipment.

In the Middle East, a multitude of institutional arrangements have developed within the last 2-3 decades with which the needs of the latter kind of small farms have been accommodated as far as the use of machinery and equipment is concerned.

Before providing some examples in this respect, it is necessary to bring back into the picture catalytic effect of migration. Migration to the non-agricultural sector, be it to the Gulf or to metropolitan areas, is invariably undertaken by some members of the rural household in order to improve the income of the household. In many instances, the remittances from these members constitute a significant portion of the income of the rural household. Again invariably, it is the managers, or the decision makers, i.e. the more capable members of the rural family that migrate.

As part of the family stays behind and as there is a reluctance to relinquish the lands of the family, efforts are made to operate the land in the absence of the labour and managers who have migrated.

Here, the "custom operator" enters. He may or may not be a farmer, but he has the machinery and equipment with which he can till, plant, cultivate and harvest other farmers' fields on a cash or share of the crop basis.

The dubious concept here is the "small farm" because the custom operator is essentially working on a large farm which is a conglomerate of small holdings. The fact that some activities are still conducted by the farm household may cloud this perspective but it is one that needs to be focused on.

Some examples in this respect can be given from Turkey, Syria, the Sudan and Jordan. In Turkey, we observe three kinds of custom operators:

- a. Small or medium sized farmers who have excess capacity in their capital equipment and may act as custom operators in a limited areas, probably their own villages. Experience in cereal producing areas in the Anatolian Plateau indicates that they provide quite efficient and technically advanced services.
- b. Large firm type operations with high mobility that provide contractual services all over the country.
- c. Harvester operators who annually move through the country in a systematic pattern, following the seasonally staggered cereal harvest.

In north eastern Syria, in primarily barley producing areas, most peasants have access to land by virtue of being beneficiaries of land reform. However, most of them are not cultivators but transhumant shepherds by tradition. Furthermore, they do not have the complementary resources to till the land. Some who are cultivators have migrated and actually work in the non-agricultural sector. They return to the village twice a year; at the time of planting and at harvest. These lands are cultivated on a sharecropping basis by large mechanized custom operators. Most of these custom operators are urban resident professionals. Some of them are claimed to operate areas measured in tens of thousands of hectares. However, due to the dry climate of the area and due to insecurity of tenure and sharecropping contracts, the level of technology utilized is very low. It is confined to planting and harvesting and is claimed by many to be equivalent to "mining" the land.

In the Sudan, tractor and harvester owners living on irrigated schemes make their services available to tenants who need them. On the irrigated schemes individual plots are too small to utilize the total capacity of such capital equipment. Therefore ownership of such equipment is primarily for the purpose of making services available in the market.

On traditional rainfed farming regions similar services provided by tractor owners in outlying areas are becoming more common. Here again, tractors are introduced to substitute for labour on areas already reserved for cultivation, as opposed to opening up new regions for cultivation which were previously allocated as grazing lands.

In Jordan, where there is a large exodus of rural population to the Gulf, both custom operators and cooperatives are active in providing tillage services to small farmers. However, the risks involved in the highly variable cereal production in Jordan is reflected in the reluctance of private custom operators to invest in advanced equipment such as drills and sprayers. These operators will have to be a target group in the efforts to increase and improve cereal production in Jordan.

Another interesting point in Jordan is that some activities (broadcasting, weeding, etc.) may still be performed by labour intensive methods. As most Jordanian labour has migrated to the Gulf, these tasks are undertaken by labour which has migrated into Jordan in place of the Jordanian labour. Most of this "replacement migration" originates from Egypt, the Sudan, or Pakistan.

It is true that when capital is not induced into a region according to its needs but is introduced as a shock it will have disruptive effects such as displacement of household labour, outmigration, polarization of farm size, etc.

CONCLUSION

Agricultural production takes place in an interrelated and interactive environment that we call the farming systems. The crucial components of this system are the household, the crops, livestock and the greater totality reached through migration and from which the household derives part of its income. A technological change introduced into the system affects the relationships within the system and is affected by them.

Our focus in this paper is on agricultural labour whether provided by the farm household or supplied by wage labour. As technological change may inevitably affect labour requirements, it will have effects on social dimensions apart from the physical production it was originally intended for. Migration, increased labour participation, increased involvement of women and children in labour processes, etc. are some of the possibilities discussed in this paper.

Conversely, labour requirements and the pliability of institutions in securing adequate labour supplies can also be crucial in determining the adoption of new technologies.

It needs to be assessed as to how the labour situation in the Middle East and North Africa may create constraints to the adoption and diffusion of technological change. This can be studied on general lines and can best be initiated with a thorough literature survey on labour, agricultural labour and migration in the Middle East and North Africa. A preliminary computerized literature search has produced very few references.

The particular manifestation of labour constraints in specific locations also need to be assessed at the diagnostic stage of FSR. Methodologies need to be developed to incorporate elicitation of information in formal and informal agro-economic surveys. In particular cases where information is scant, it may be necessary to undertake first demographic surveys in sample localities that are interrelated through labour relations and second to undertake follow-up socio-economic surveys based on the results of the demographic survey in order to assess the agricultural labour conditions.

Preliminary efforts at ICARDA directed at labour issues will provide a basis on which to develop further labour studies and complement the efforts of FSP in approaching constraints to technological change.