

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 BIBLIOGRAPHIC INPUT SHEET		FOR AID USE ONLY Batch #20
1. SUBJECT CLASSIFICATION	A. PRIMARY Agriculture	AE30-0000-0000
	B. SECONDARY Development	
2. TITLE AND SUBTITLE The role of land tenure in the modernization of agriculture		
3. AUTHOR(S) Kanel, Don		
4. DOCUMENT DATE 1972	5. NUMBER OF PAGES 17p.	6. ARC NUMBER ARC
7. REFERENCE ORGANIZATION NAME AND ADDRESS Wis.		
8. SUPPLEMENTARY NOTES (<i>Sponsoring Organization, Publishers, Availability</i>) (Presented at Purdue Workshop on Small Farm Agriculture, 1972)		
9. ABSTRACT		
10. CONTROL NUMBER PN-RAB-233		11. PRICE OF DOCUMENT
12. DESCRIPTORS Land tenure Modernization		13. PROJECT NUMBER
		14. CONTRACT NUMBER CSD-2263 211(d)
		15. TYPE OF DOCUMENT

For LTC 211(d) file

Preliminary

Don Kanel
Agricultural Economics/
Land Tenure Center
University of Wisconsin
October 25, 1972

THE ROLE OF LAND TENURE
IN THE MODERNIZATION OF AGRICULTURE*

I am primarily concerned in this paper with the ability of small farms to respond to development opportunities and their viability in interaction with larger farms.

Without developing it here, I am basing myself on arguments that a small farm is capable of achieving economies of scale (1,9). Unlike in industry, in most types of farming there are no decisive economies of size to large scale units, and farms of different size can coexist.

I mean by an efficient small farm, a family farm, with the combination of labor and labor-saving capital appropriate to the opportunity costs in the economy, and with sufficient land to provide full employment to family labor and capital. Such a farm can achieve economies of size and be as or more efficient than larger farms. I realize that most peasant or minifundia farms fail to meet the above criteria for an efficient small farm.

The purpose of these introductory remarks is only to assert that one does not need larger-than-family farms to achieve economies of size in crop and livestock production. But the efficiency of the farm firm is also dependent on infrastructure and marketing, processing, credit, research and other functions provided by private and cooperative firms

*Prepared for Purdue Workshop on Small Farm Agriculture, November 13-15, 1972.

and by government agencies. The interactions between farm and service firms can be provided by markets or by various degrees of integration of functions within the same firm. To serve the needs of development, a family farm agriculture needs an appropriate structure of service firms; and if these do not exist, then larger farms are more likely to dominate the agricultural sector.

The family farms of the developed countries are largely firms carrying on production functions which are difficult to standardize, difficult to supervise, and which do not lend themselves to division of labor (biological and seasonal activities). These are residual functions, while other functions have tended to be taken over by separate firms as changing technology has created economies of size: butter and cheese making, canning of fruits and vegetables, and tendencies toward large scale or contracting in broiler production and cattle feeding. All these activities were formerly within the farm firm. On the other hand, where markets and infrastructure are not well developed there probably are tendencies for larger firms to integrate farm and service functions, thus favoring large farms and making it more difficult for small farms to play a dynamic role in development. In these cases economies of size shift to larger farms because of the need for firms to provide infrastructure, processing and marketing as well as crop and livestock production.

In the discussion below I will present three case studies which illustrate diverse issues. It seems to be that the following aspects are important:

- 1) The large farms of many countries are the historical result of

various processes (feudalism, conquest, etc.) which have little to do with strictly economic viability of different sizes of farms. That is, their size is not due to competition between farms in factor and product markets but is due to other causes. However, since such farms exist, they are available to assume a new modernizing role in introducing new technology, infrastructure and processing. On the eve of rapid economic development such farms are owned by the elite.

2) In European development in the XIX century, urbanization and attractive opportunities in industry, commerce, politics and education drew the elite (as well as new classes) to nonagricultural opportunities, leaving agriculture to the peasants. Absentee ownership is particularly deadening to incentives and initiatives when owners lose interest but continue their ownership. The West European land reforms from the French Revolution on facilitated transfer of ownership from inactive to active managers, though these transfers were also accomplished by voluntary sales. The underlying rationale for the transition was: a) economies of size achievable on family farms and b) greater attractiveness of nonagricultural opportunities for wealth and entrepreneurial ability.

3) Development opportunities in the LDC's in the XX century (and particularly the Green Revolution) may have a different balance of underlying factors. At a time when nonagricultural opportunities are still limited, the Green Revolution has brought sudden and dramatic increases in income. On larger farms, income of the landowner can be increased by mechanization, by displacement of tenants and hired workers, and by active management.

4) In addition, at a time when government agencies, cooperatives and private marketing firms serving small farmers are poorly developed,

actively managed large farms can assume the role of providing services and infrastructure, and aggressively expand into new markets as opportunities develop.

5) Under these circumstances, attractive income opportunities in agriculture and active management on large farms, private operators of large farms will be making crucial decisions about how agriculture is to be modernized. Development is more likely to proceed along a capital-intensive, labor-saving path, increasing the employment problem and concentrating the benefits of development in a few hands. These patterns are directly opposed to the requirements of a situation characterized by much more rapid population growth and more deficient employment opportunities in industry than those which characterized XIX century European development.

Illustrative Case:

A. Butter Production In Denmark (from Skrubbeltrang, 13)

Danish land reforms at the end of the XVIII and beginning of XIX centuries abolished manorial agriculture and serfdom, carved out peasant farms from parts of the feudal estates, while preserving large farms from the remainder of the feudal estates. Large farms after the reforms were formed by hired labor housed in barracks. Further transfer of land to the peasants occurred by voluntary sales supported by special credit programs.

The transition described below is part of a general Western European shift to greater production of livestock and livestock products as a result of the flood of grain exports from the New World after 1870.

In the beginning of this period, large farms made butter of much

higher quality than peasant farms. Premium prices for estate butter were as much as double the prices of ordinary farm butter and only estate butter was exported (p. 189). Cooling of milk, sanitary facilities and expert management were the key factors in butter quality. Large farms had spacious milk cellars, cooled milk with cold water and later with ice, used thermometers, and placed butter production under a dairy manager or a dairywoman (pp. 188, 191). On small farms, cows were plentifully fed only in the summer, milk was left to sit for two days so that cream could be skimmed off, then the cream was left to curdle before churning butter in a hand churn. (p. 189)

The transformation had a technological aspect, the centrifugal cream separator, and an institutional aspect, shift of butter-making from the farm to a cooperative creamery. A cooperative creamery provided a separator and cooling facility so that separation of cream and cooling could occur much more quickly after milking, and it had a trained manager to look after production and quality control. Skim milk was returned to farmers and fed to pigs. The number of cooperative dairies increased rapidly from 176 in 1886, 600 in 1890, and 942 in 1900. "Many manor dairies were ultimately closed down, the owners joining the cooperative dairies, founded and managed by peasants." (p. 193) In the beginning of the XIX century "landowners were no longer the best farmers and they often had a bad reputation on account of the conditions they offered their laborers, who would in many cases have to live in dilapidated landless cottages or in barracks." (p. 271)

B. Green Revolution In Pakistan (from Gotsch 6, 7)

Output increased at the rate of 7 percent per year in the period 1960-70. Three waves of innovation:

- 1) **Tubewells - Increase in water availability of 50 percent, increased production of sugarcane, cotton and rice.**
- 2) **Seed-Fertilizer Revolution. New wheat varieties introduced 1966-67. In 3 years 90 percent of the acreage of wheat was under improved varieties, fertilizer sales increased more than four fold, wheat yields were up 60 percent.**
- 3) **Mechanization. Yield increase 10-15 percent, significant increase in crop intensity dependent upon more rapid land preparation between growing seasons.**

According to 1965 survey, 4200 wells were established, 54 percent on farms over 50 acres, 30 percent on farms of 25-50 acres, 16 percent on farms under 25 acres. There were 223,000 holdings in the district, 43 percent under 5 acres, 51 percent on 5-25 acres, 6 percent over 25 acres.

On this basis about 30 percent of the farms over 25 acres had wells. Smaller farmers either installed jointly owned wells or purchased water. Sixty-eight percent of farmers with less than 25 acres were purchasing water, but amount of water per acre was only 20 percent of optimal amount and may reflect lack of credit (cash payments required for water purchase) or monopoly rents for water.

Seed-Fertilizer Revolution. The initial seed supply went to larger farmers, but within 2 years seed was widely available. In 1970, 84 percent of smaller farmers were using high yield varieties and 76 percent were applying fertilizer, but the level of fertilizer use per acre was 50

percent of optimal amount and below that of large farmers.

Mechanization is affecting small farmers primarily by causing eviction of tenants. Also some limited evidence that larger farmers are attempting to purchase additional land. Thirty-one percent of farmers under 25 acres purchased tractor services, but all such farmers retained the full complement of bullocks and equipments. Thus, no gain from decrease of feeder production. The impetus for using new technology more from farmers holding 50 to 200 acres than from the very large farmers with 200 to 500 acres. In the period 1950-59, of the land held by farmers with 50 to 100 acres, 20 percent was acquired by purchase; those with over 100 acres lost 15 percent of their land and smaller farmers lost 10 percent of their land.

Economies of Scale

	Break-even point	Least cost
Traditional Technology		30 acres
Traditional Technology & HYV		30 acres
Traditional Technology & HYV & Tubewell	30 acres	40 acres
Mechanization & HYV & Tubewell	45 acres	100 acres

(HYV - High Yielding Varieties)

C. Large Farms in Production of Exports and Domestic Food Crops in Central America (from Dorner and Quiroz A, II)

This case is based on the experience of the five countries of the Central American Common Market: Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica. Large farms dominate the production of the

traditional export crops, coffee and sugarcane, as well as the newer exports of cotton and beef, and foreign-owned plantations control production of bananas. Marketed supplies of domestic food crops, corn, rice, wheat, sorghum and beans, have traditionally come from smaller farmers.

In the period 1950-67 rapid expansion in export crop production occurred utilizing labor-saving technologies. Between 1950 and 1964 Guatemalan coffee output increased by 157 percent (coffee acreage increased by 85 percent) but employment increased by only 7 percent. Expansion of cotton in Nicaragua led to a massive displacement of small grain-producing farmers, who were formerly tenants of livestock ranches but were displaced by the shift to cotton. Mechanized land preparation and chemical weed control have decreased the need for permanent labor, while harvesting remained a labor-intensive seasonal activity. However when labor was displaced from a zone (as in cotton production) and labor shortages appeared in the harvest period, mechanization of cotton harvest was resorted to. In Nicaragua, the number of mechanical cotton pickers increased from 13 in 1963 to 200 in 1967, and about 20 percent of the crop was mechanically harvested in the latter year. In general, growth of export crop production has provided little increase in employment, and has shifted some workers from year-round to more precarious seasonal employment.

Processing in coffee, sugar and bananas is integrated with farm production, but these facilities also serve as market and processing outlets to independent farm producers. In the case of bananas, the integrated firm also has market control, and when demand is low in

International markets, purchases are reduced from independent farm producers.

The most interesting change and most damaging to participation of small farmers in development is the shift of export-producing firms into production of domestic food crops. After 1964 cotton acreage contracted due to declining international prices and increasing costs (increasing pest infestation and larger control costs). About two-thirds of this acreage was shifted to crops, mostly corn, with some rice, sorghum and kenaf, while the remainder reverted to natural pasture. This was large scale mechanized production presumably using the equipment previously used for cotton production. This increase in food grain production on large farms accounted for about half of the increase in corn production in El Salvador in 1966-67.

In bananas, expansion into new markets was partly motivated by demand stimulated by the formation of the Central American Common Market. Since the formation of the Common Market, United Fruit Company has made major investments in the oils and fat industry. These investments have made it profitable to diversify its commercial production with African palm, beef cattle, basic grains for the regional market and pineapples.

Implications

The Danish example illustrates the competitive viability of the family farm when the needed marketing and processing services as well as infrastructure are provided by cooperative and private firms and public agencies. It is under these conditions that the farm firm needs to concentrate only on crop and livestock production activities in which there are no economies of size. Under the same conditions the larger

farm suffers from its unattractiveness to hired workers (bad working and housing conditions), and lower incentives for worker productivity, without the offsetting advantages that such farms had when they possessed superior technology and processing facilities.

In the Pakistani case, the tubewell seems to have become the crucial indivisible unit of capital, and a basis for an advantage of larger farms. If irrigation wells were to be cooperatively or publicly provided (or with a competitive market in water) the advantage of larger farms would have decreased, and the crucial indivisible unit of capital would have been a team of oxen or a garden tractor. This is by no means the only or even the major factor favoring large farms in Pakistan, but it illustrates my argument about the dependence of economies of size in the farm firm on the supply of complementary services.

In the Pakistani case, high wheat prices, availability of credit and undervalued foreign exchange (equivalent to low prices of machinery) favored mechanization on large farms (5). In addition, I suspect, that the dramatic increase in incomes obtainable from agriculture compared to still limited nonagricultural opportunities were important in increasing the attraction of agricultural entrepreneurship to persons of wealth and entrepreneurial ability.

The above contrast implies that appropriate technology and institutional innovation (the cream separator and the cooperative creamery in the Danish case) are the measures which enhance the economic viability of the small farm. But the recognition of need does not produce the required solution. The machine technology available for direct transfer comes from the developed countries and is too labor-saving for conditions in LDC's; more precisely it is directly usable and often attractive to the larger farms

of the LDC's and enables them to pursue a labor-saving pattern of agricultural development. And viable cooperative organizations are notoriously difficult to establish.

Nine years ago, Theodore Schultz wrote that "It is much easier for a poor country to acquire a modern steel mill than a modern agriculture."(12) This has a double aspect in that: 1) much of the relevant biological technology is not directly transferable from developed to less developed countries (unlike steel production technology) and 2) the managerial-entrepreneurial function in agriculture is as or more difficult than in industry but without the large economic returns which economies of size generate for management in industry. The solution in the United States, Western Europe and Japan distributes the responsibilities for research and development, entrepreneurial innovation, and integration of complementary production functions among many private, cooperative and public agencies with integration achieved by markets, contracts, and membership in cooperatives; this is in contrast to much greater integration of functions within large firms in the nonagricultural sectors of the same economies. This solution has been very productive in terms of agricultural development and accommodates the high cost and low returns to management in crop and livestock production. The question is whether this solution is transferable to XX century conditions in the LDC's characterized by more sophisticated technology now available and the wide gap between large and small farms in many LDC's?

When large farms exist, when some of them already own their own processing facilities, when most of them have much better access to credit and information about technology and markets, then development along the

lines sketched out above becomes a difficult and costly substitution of new infrastructure and processing facilities for those partly existing on large farms. It is then probably quicker and cheaper to concentrate public research, extension and investment activities in a manner that supplements facilities on large farms and that fosters increase in production primarily on these large farms. Also if opportunities are attractive enough, large private firms will respond to them by their own efforts, with minimal public assistance. This is characteristic of plantation agriculture and is illustrated by the Central American case above.

Under these conditions, the creation of development opportunities for smaller farmers may depend on wholesale land reforms which abolish large farms. Then there are no alternatives to developing technology and institutions which serve small farmers. Gotsch argues for this as one possible solution (the other being cooperative farming) in contrasting use of tubewells in Pakistan and Bangladesh (7). In the latter case small farms were predominant, and cooperative or joint ownership arrangements had to be and were worked out to make possible the use of tubewells. On the other hand, in Pakistan tubewells were predominantly installed by larger farmers. In a similar manner, Clark describes the rebuilding of the marketing system in Bolivia after the land reform. (2, 3) Before the reform the landowner transferred the bulk of the marketable surplus from his hacienda to his own warehouse in town. After the reform new market towns and itinerate truckers appeared to assume the marketing functions.

In many countries such revolutionary transformations of the land

tenure system will not occur. It seems to me that an important area for the Purdue research on the economics of small farm agriculture in Latin America (as well as for us in the Land Tenure Center) is to study what conditions make it possible to increase the opportunities for small farmers in a dualistic agriculture where large and small farms coexist (study of such programs as the Puebla Project in Mexico). After all Danish agriculture of the 1870's was a dualistic agriculture with a much more unequal land ownership distribution than the Indian Punjab and probably the Pakistani Punjab, but less unequal than much of Latin America. If the difference between Denmark and present LDC's was a greater presence of attractive nonagricultural opportunities in XIX century Europe, then not much can be done about it (except the way this underscores the importance of credit, foreign exchange and price policies of LDC governments). But it should be the purpose of research to ascertain what the possibilities are.

If the only task of development is to achieve rapid production increase in the agricultural sector, then it doesn't matter whether this is accomplished with a large farm or a small farm agriculture. But given current rates of population increase and growing problems of insufficient employment, a greater role for the small farm does become important. Agricultural development dominated by large farms is very likely to be labor displacing (8). This is illustrated in the Pakistani case where larger farmers not only have sufficient size for the private installation of tubewells, but also, as a result of the Green Revolution, have the incomes and incentives to mechanize.

"Despite all its imperfections, peasant proprietorship provides

considerably more security to the agricultural population than ownership vested in large landowners. An agriculture of landowning peasants provides a shelter for the masses of people for whom outside employment is not available. It absorbs population increases up to the limits of capacity to support life. On the other hand, it does not necessarily act as a barrier to out-migration when employment opportunities appear elsewhere. It permits the use of new technological opportunities in farming, but those who have no alternatives or who cannot or are not ready to utilize new technology have access to subsistence. By contrast, in an agriculture dominated by large landowners, continued peasant employment depends on employer decisions, and for a variety of reasons, more active management by these landowners often leads to a relatively labor-saving path of modernization. These considerations are very important in the earlier stages of development when the growth in nonagricultural employment opportunities is low and the bulk of the population depends on agriculture.

The response of peasants to the stresses and insecurity associated with development has been different from that of the industrial workers because of the distinct conditions in the two sectors. Individual ownership of the means of production in modern industry is an impractical goal because of the decisive economies of scale. Workers have increased their economic power by unionization and by supporting the enactment of legislation requiring collective bargaining, particularly by setting up procedures to handle grievances and to govern dismissal of workers. Protection against unemployment is increased by expansionary fiscal and monetary policies and by special programs such as public unemployment insurance.

For several reasons it is easier to build both security and flexibility into industrial employment. If industrial jobs are being created at a

sufficient rate, secure employment can be provided for those already in the industrial work force, and alternatives are available for new additions to the labor force. Industrial workers usually do not live in company-owned housing, and in an urban area they are usually in proximity to a number of potential employers. Thus urban conditions are more conducive to changes in place of employment and to a more impersonal relationship between employers and workers.

Rural conditions are different in all these respects. In most types of farming there are no decisive economies of scale so that family and larger farms can coexist. Development is less likely to increase demand for labor in agriculture, and in a sector dominated by large farms the tendency may be to decrease employment. Also, development involves basic changes in the long standing tenure and labor arrangements. Thus development in agriculture is likely to be much more disruptive than in industry. Further, housing patterns differ from those in urban areas. In many types of large scale agriculture, workers live on farms of their employers. Loss of job then means loss of home and home community as well; additionally, potential alternative employers are at a greater distance than in urban areas. Farm workers who live in homes of their own usually have employment on large farms only by the day and work at seasonal tasks when work requirements exceed the capacity of the resident labor force. Employment available to such temporary workers is usually the most insecure. They are often the most poverty-stricken of all rural classes.

For all of the above reasons, the peasants have not been able to utilize the protective devices used by industrial workers. The more typical peasant remedy has been the drive to achieve land ownership and to supplement this with public and cooperative service organizations." (pp. 31, 32)

References

1. Brewster, John M. "The Machine Process In Agriculture and Industry." Journal of Farm Economics. Vol. 32, No. 1, February 1950.
2. Clark, Ronald J. "Land Reform and Peasant Market Participation in the Northern Highlands of Bolivia." Land Economics. Vol. 44, 1968.
3. _____. "Agrarian Reform, Bolivia." Chapter 7 In Land Reform In Latin America, Issues and Cases, Peter Dorner, editor. Land Economics Monographs No. 3, Madison, Wisconsin 1971.
4. Dorner, Peter and Quiros, Rodolfo. Structural-Institutional Dualism In Central America's Economic Development. Unpublished manuscript, Land Tenure Center, University of Wisconsin, 1972.
5. Falcon, Walter P. "The Green Revolution, Generations of Problems." American Journal of Agricultural Economics. Vol. 52, December 1970.
6. Gotsch, Carl H. The Distributive Impact of Agricultural Growth: Low Income Farmers and the 'System' (A Case Study of Sahiwal District, West Pakistan). Seminar on Small Farmer Development Strategies. Agricultural Development Council and Ohio State University. September 13-15, 1971.
7. _____. "Technical Change and the Distribution of Income in Rural Areas." American Journal of Agricultural Economics. Vol. 54, No. 2. May 1972.
8. Johnston, Bruce F. and J. Cownie. "The Seed-Fertilizer Revolution and Labor Force Absorption." American Economic Review. Vol. 59, September 1969.
9. Kanel, Don. "Size of Farm and Economic Development." Indian Journal of Agricultural Economics. Vol. 22, No. 2. April-June 1967.
10. _____. "Land Reform as a Policy Issue in the Modernization of Traditional Societies." Chapter 2 In Land Reform In Latin America, Issues and Cases, Peter Dorner, editor. Land Economics Monographs No. 3. Madison, Wisconsin 1971.
11. Quiros, Rodolfo. Agricultural Development and Economic Integration In Central America. Ph.D. Thesis. Department of Agricultural Economics. University of Wisconsin. Madison, Wisconsin 1971.
12. Schultz, T. W. "Economic Growth from Traditional Agriculture." Agricultural Sciences for the Developing Nations. Publication No. 76, American Association for the Advancement of Science, Washington D.C. 1964.

13. **Skrubbeltrang, F. Agricultural Development and Rural Reform in Denmark. Agricultural Studies No. 22, Food and Agriculture Organization, Rome 1953.**
14. **Thiesenhusen, William C. Technological Change and Income Distribution in Latin American Agriculture. LTC No. 78, Land Tenure Center, University of Wisconsin, Madison, Wisconsin. August 1971.**