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NATIONAL SECURITY IMPLICATIONS
OF STRUCTURAL CHANGES IN
U.S. AGRICULTURE

GENE WUNDERLICH*

Before one can discuss the national security implications of the structural changes taking place in U.S. agriculture, the structural changes and the relationships between these changes and national security must be described. Structural changes in agriculture can include a variety of modifications in the quantities and qualities of human, capital, and land resources used to produce food, the relations between producing and marketing units, the forms of markets, and the relation of entrepreneurial units to public programs. This paper, however, defines structure as the size and distribution of farms and farmland ownership. These elements of structure reflect the general condition of agriculture and serve as indicators of present and future change.

National security is defined broadly. National security means more than military defense. The definition encompasses national expectations concerning total and per capita growth in income, shared feelings of well-being, the proportion and numbers of disadvantaged persons, the development of human capacities, the respected position of the United States among other nations, and a minimal threat of foreign invasion or attack. National security includes military preparedness to the extent that it bears on national well-being. Thus, a capability to wage war may be complementary or competitive with national security.

Implications drawn from agricultural policy and performance are often expressed in economic or, more precisely, money terms. Thus the benefits and costs of various policies are usually shown by changes in wealth, income, costs, and prices. Although such economic terms appear, or are emphasized in this analysis, other values such as enlightenment and foresight may be more important in assessing the costs and benefits of policy.

Changes in the structure of agriculture—the number and organization of farm units and the ownership and control of resources—continue to take place, as they always have, in a context of economic, social, and political conditions. The question, therefore, is not if there is change, but how and why. This paper examines the historical structure of agriculture. Farm size, tenure, ownership, and values will also be examined.


Historical Perspective

The unequal distribution of resources and of decision-making power has been a characteristic of American agriculture. This is illustrated by the huge land grants that were made to various proprietors in the early colonies. The Maryland Palatinate under Lord Baltimore attempted to create a feudal tenure system by granting manors of 3,000 acres or more, each with trappings of European feudal organization. Henry McCulloh, John Lewis, and Lord Fairfax are names associated with grants of 100,000 or more acres of colonial Virginia.¹

The Carolina Proprietors distributed land through an aristocratic hierarchy of counties, seigniories, baronies, and precincts. Land titles to 800,000 acres were granted to landgraves, many of whom were governors and friends of the Proprietors. The Carolina Proprietors based their system of land distribution on the Grand Model fashioned by John Locke, who is sometimes cited as an intellectual ancestor of political liberty through private ownership.² Thomas Jefferson stressed the importance of widespread ownership of land and the creation of the family farm.³ Jefferson, however, clearly recognized that as an economy or a society matures, agriculture would also change.⁴ So too, today's agriculture is changing in response to changes in economic opportunities.

In the nineteenth century, the United States bought political and economic security with its land purchases. Access to large quantities of unsettled land probably contributed more to the widespread ownership of farmland than did political independence. By the end of the nineteenth century, however, new lands for settlement were no longer available. By the mid-twentieth century, the changes in agricultural technology and the urbanization and industrialization of the United States' economy had transcended an economy of yeoman farmers. Resource ownership or decision making was no longer concentrated in agriculture but was integrated into the rest of the economy.

Farm Size

The 2.2 million farms in America enclose slightly less than a billion acres, about 45 percent of the land area of the nation, or about 70 percent of the private land. These farms represent a wide range of sizes and enterprises. Thus any broad classification is likely to be arbitrary. Three size groups, however, do indicate three different roles of farm enterprises in the United States. Small,
complementary enterprise (CE) units, large commercial (LC) operations, and middle-scale (MS) farms perform different functions in the agricultural and nonagricultural economies. The following chart shows the number of farms, the acreage, and the dollar value of sales for each farm-size group:

<table>
<thead>
<tr>
<th>Size Class</th>
<th>Number of Farms</th>
<th>Acres of Land in Farms</th>
<th>Dollar Value of sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complementary Enterprise</td>
<td>1.1 (49%)</td>
<td>121 (13%)</td>
<td>4 (3%)</td>
</tr>
<tr>
<td>(less than $10,000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle scale</td>
<td>.8 (38%)</td>
<td>380 (41%)</td>
<td>32 (25%)</td>
</tr>
<tr>
<td>($10,000 to $100,000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large Commercial</td>
<td>.3 (13%)</td>
<td>431 (46%)</td>
<td>96 (72%)</td>
</tr>
<tr>
<td>($100,000 or more)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**Complementary Enterprises (CEs)**

As the preceding chart indicates, about one-half of the Census-designated farms market less than $10,000 of products in a year. The CEs account for only 3 percent of the value of sales, but they account for 13 percent of the farmland area and 16 percent of the value of land and buildings. Many of these units are rural residences with farm enterprises to complement off-farm work or retirement. The CE farms affect the rural landscape, local supply businesses, and housing. The CEs form a transition between the agricultural and nonagricultural sectors and provide entry into and exit from farming for those who only have resources for, or prefer, lower levels of engagement.

Most important, some of the CEs provide a cushion against the economic shocks of changing employment and income variation. Fifty-five percent of CE operators work full time (more than 200 days annually) off the farm. Two-thirds work off the farm at least 100 days.

Large Commercials (LCs)

The other one-half of the farms in the United States produce virtually all of the value of marketed farm products. The LCs, each selling $100 thousand of products or more a year, account for almost three-fourths of the value of production. The MSs market about one-fourth of the value of production.

If concentration were to become an issue in terms of volume of production, the LCs would be the focal group. Taken together, the LCs number 300,000, but geographic and production specialization results in much smaller subgroups: 6,700 cotton farmers, 5,400 tobacco growers, 3,600 vegetable growers. The 97,000 cash grain farmers represent the largest group under the Standard Industrial Classification, but they too are widely divergent in area and in the products they produce. Market concentration, however, is not sufficient for producers to control prices without government participation. Supply and price manipulation, where it exists in the private sector, is in commodity marketing and transportation. International trade influences the behavior of agricultural marketing firms. Indeed, international competition increases the likelihood of some governmental involvement in the supply and price of farm products.

Middle-Scale Farms (MSs)

The 800 thousand farms identified form a large middle ground between the nominal operations of the CEs and the full-time LC farms. The MS group occupies as much territory as the LCs do and produce 25 percent of the value of sales. The flexibility of this group may provide much of the stability of agriculture as an industry.

Historically, the reduction in farm numbers, and the consequent increase in size, was caused by settlement patterns and mechanization. Mechanization permitted the concentration of energy per worker, enabling larger land areas to be covered. By contrast, much of the recent technological innovation has been chemical and biological. The chemical and biological advances in agriculture will result in cost savings or intensification of production on a farm's given area. Thus farm size, in acres, will grow less than in the past.

At any particular time or state of technology, size is largely a function of financial capacity or opportunity. For most of U.S. agriculture, size has little to do with production efficiency, that is, with output per acre. When crop and irrigation are held constant, the yield per acre is virtually the same for

all but the very small and very large farms. Other scale-oriented studies show little difference in efficiency as a result of farm size. The financial advantages of size are the large farms' ability to procure supplies at lower unit cost and to obtain credit on more favorable terms. Another advantage of larger farm size is in replicative knowledge (it takes much the same knowledge to raise one calf as a herd of cattle) as distinct from unique knowledge associated with organization, timing, or phasing. The net effect of these advantages is a likely slow increase in farm size, but with the advantages of size increases benefitting individual farms, and not the economy as a whole.\(^\text{11}\)

**Owning, Occupying, and Controlling Land in Agriculture**

Farm sizes vary to accommodate not only physical conditions, such as climate, water availability, and transportation, but, within regions, different occupational interests and household circumstances. There is a tendency for

larger farms to have greater income per farm. Small size, however, does not necessarily mean small production, nor large size large production. In 1982, 7,500 farms of less than 10 acres each produced more than $100 thousand of farm products, and more than 8,000 farms with more than 1,000 acres produced less than $10 thousand in sales. Neither farm size nor volume of sales is necessarily related to household income.

Modern agriculture does not always fit the traditional definition of farms as self-contained, autonomous decision units producing only farm commodities. Modern agriculture may be described more accurately as sets of enterprises occupying land that is controlled by owning, leasing, and borrowing. Many traditional farms still exist where an entire household is engaged in producing commodities and the only external influence is the impersonal force of the market. A large and growing population of farm enterprises, however, are fused to a diversified integrated economy. Nearly one-half of the operators of Census-defined farms report a principal occupation other than farming. More than 80 percent of the operators work some time off the farm, and more than 50 percent of the operators work two hundred or more days off the farm.

Land Tenure

Land has held, and continues to hold, a prominent place in agriculture. Land tenure, therefore, is a proxy for power in the relationships between resource owners, resource users, and policymakers. Landownership defines a set of claims on income and wealth. Within limits, ownership also defines prerogatives on land use and transfer. Decisions on use are either deferred to, or shared with, tenants. Others, such as agents for financial institutions or regulatory bodies, also share in the decisions about how land is used. Land tenure, along with farm size, kind of ownership, and the organizational form of the farm operator, describes the structure of agriculture.

The available information reveals the following trends in land tenure. First, the proportion of land controlled through lease has been remarkably stable, ranging between 25 and 40 percent since the Census began reporting this data.12 Second, part owners have increased in number and, on the average, they operate larger units than owners or tenants. Third, nonfarm owners have acquired a larger share of land than in the past, but not out of proportion to the rural-urban structure of the population.

The proportion of land operated by part owners has increased from 12 percent in 1900 to 56 percent in 1982, the last available tenure data. This mixed tenure class is but another side of the combination of employments observed above. To make the best use of available resources, farmers expand operations through leasing and, as opportunities arise, through nonfarm employment or investment. Even though social status and economic security are still associated with land ownership, the trend is to perceive tenancy as simply another way to access resources in a commercial operation.

It is useful, when considering farm tenure arrangements, to note their economic equivalencies and institutional differences. Payment in a fixed cash rental will tend, on the average, to be lower than a share rent because the tenant bears all the risk of price and output variation. There are cash and share rents that more or less balance out and reflect the preferences of tenant and owner to share risk. Similarly, leasing can find an equivalency in ownership. Ownership under mortgage with a loan repayment of interest only is the economic equivalent of leasing. Differences between a lease and an interest-only loan depend on how the contracts affect payment revisions or postponements, foreclosure, and other features. Ownership, under long-term credit terms, may differ little from leasing.

Were Thomas Jefferson to observe agriculture in today’s economy, he might conclude that extensive ownership of farmland by nonfarmers adds to the stability of both the economy and society. With 70 percent of the private land area of the United States in agriculture, ownership by only 2 million farm operators does concentrate holdings in relation to the whole population. Given current sizes of farms, it is impossible to have both operator ownership and widespread ownership.

The Owners

More than 75 percent of agriculture wealth is in the form of land.\textsuperscript{13} Who owns this wealth? The distinction between farmers and nonfarmers is ambiguous because farming is only one role played by more than one-half of those designated as “farmer.” Overlooking such ambiguities, however, the most recent Census of Agriculture data provides tenure and ownership information which divides the ownership of agricultural land between farm operators and landlords, who do not operate a farm:

<table>
<thead>
<tr>
<th>Type Owner</th>
<th>Owners of Agricultural Land, 1982</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Owners</td>
</tr>
<tr>
<td></td>
<td>(millions) (%)</td>
</tr>
<tr>
<td>Farm operators</td>
<td>2.0 57</td>
</tr>
<tr>
<td>Not farm operators</td>
<td>1.5 43</td>
</tr>
<tr>
<td>Total</td>
<td>3.5 100</td>
</tr>
</tbody>
</table>


\textsuperscript{13} BUREAU OF CENSUS, U.S. DEP’T OF COMMERCE, 1979 FARM FINANCE SURVEY, part 6 at xix (1980).
Owners who do not operate a farm hold more than one-third of the farmland. According to a 1979 survey of landlords, 85 percent are individuals or families, 6 percent are partnerships, 3 percent are corporations, and the remaining 6 percent are other public and private organizations. About 12 percent of landlord-held land is owned by corporations, predominantly family corporations. About one-third of the landlords are related to at least one of the renters.

Most farmland, however, is owned by the person who farms it. About 90 percent of farmers own some farmland. Nearly 60 percent own all the land they operate, which is about 35 percent of all land in farms. Of the 2.2-plus million farmers, 11 percent rent or subrent 48 million acres to other farmers. Thus, approximately 2 million farmers own about 600 million acres, that is, two-thirds of the farmland or 45 percent of the 1.3 billion acres of private land in the United States. As a percentage of population eighteen years and older (01%) or of households (02%), the ownership of so much farmland by a number even as large as 2 million farmers is extremely concentrated.

The policy issue is whether landownership should be retained by those who use it—farmers—or whether it should be distributed widely throughout the population. In an earlier time it might have been both, but no longer. The U.S. is not yet at a point of manorial control, but it has sufficient concentration of large amounts of farmland to be concerned about large farmer ownership.

Land Values

One characteristic of a farm as a business unit is its large commitment to land. This commitment to land and the susceptibility of land to value fluctuations can affect the financial viability of many farms. Between 1982 and 1985 the value of land and buildings dropped 18 percent nationally, and in several states the decapitalization of land exceeded 25 percent. Nearly one-fifth of the farms in the U.S. are heavily leveraged (debt/asset ratios over 40 percent) and are carrying well over one-half of the total agricultural debt.14

National Security

Agriculture, like many other sectors of the economy, affects national security in terms of production capacity and the ability to accommodate change and adversity. Agriculture’s strength is measured by its ability to produce food and fiber for domestic consumption and export, to sustain production in the long run, to adapt to changing technology and economic change, and to improve the quality of life of those supported by agriculture.15

Capacity to Produce

The current physical capacity of United States agriculture is enormous. Despite the financial difficulties of many farms, the physical output is at or near record levels for all major commodities. Wheat supplies, for example, because of near record production—4 billion bushels—and reduced disappearance, will probably be at a record high this year. Concerns about the long-run capacity of agriculture to meet world (even domestic) demands, commonly voiced only a few years ago, have now been replaced by concerns about excess production. Both extremes are probably misplaced, but both statements contain some truth. The production from about 40 percent of the harvested acres in the U.S. goes to export markets. It is clear, however, that agricultural exports are not, nor are they likely to be, sufficient to create a positive trade balance for the United States. Nevertheless, export capability provides opportunities for trade that probably enhance the national security of the United States.

The physical availability of food and fiber for domestic consumption is secure given economic, social, and political conditions of the recent past. The structure of agriculture could influence availability if control over stocks and productive capacity were concentrated. The wide diversity of farm sizes and the similarity of technical efficiencies over a wide range of sizes, however, suggest that control of the production of major commodities is unlikely. Yet, the productivity and flexibility resulting from the mix of farm sizes and the widespread ownership of agricultural resources will permit long-run adjustment to world demands.

Related to the issue of world food demand is the United States' foreign assistance programs. Official pronouncements that the U.S. will not "use food as a weapon" notwithstanding, the availability of stocks of food and other primary goods is a powerful instrument of foreign policy. Foreign assistance generally involves government ownership or control of the commodity. Therefore, the structure of agriculture would affect the level and distribution of foreign aid indirectly, if at all.

Capacity to Conserve and Shift Production

Conservation, the capacity to sustain production, is closely related not only to the structure of agriculture but also to national security. Conventional wisdom holds that private ownership and "exploitation" of agricultural resources, otherwise unrestrained, probably favors current income and well-being over future well-being. Some studies have shown that nonoperator landlords tend to invest less in capital expenditures for conservation. Other

studies, however, have shown little difference among various classes of owners in their conservation and land-use practices,\textsuperscript{19} or in the conservation practices of operators on rented and owned land.\textsuperscript{20} The studies suggest that some incentives to conserve resources may be unrelated to production or income.

\textit{Flexibility}

The present structure of agriculture provides substantial flexibility. This flexibility enhances America's national security posture. Production shifts among regions, such as the movement of cattle into the Southeast, the shift of wheat into the Corn Belt and Southeast, and the adoption of sunflowers in the northern plains, indicate that economic pressures can change the comparative advantage of climatic features over a wide range. Migration of labor out of agriculture in the 1960s and 1970s and the increased mixing of occupations and enterprises provide substantial flexibility under current structural conditions. The current decapitalization, however devastating to many individual farms, will probably not adversely affect the industry's capacity to produce.

Large-scale production, which substitutes capital for labor, may employ production practices that are economical for the farm firm, but result in undesirable side effects that are borne by others. For example, fungicides needed to grow wheat in the warm, humid Southeast may contaminate water or alter other biological processes. The intensive care needed to grow some crops or animals in areas not naturally suited for their growth may require highly specialized hybrids vulnerable to unforeseen hazards.

\textit{Beyond Food and Fiber Production}

If national security is to be defined in broader terms than military preparedness and production capacity, the structure of agriculture should be of concern beyond the short-run capacity to produce food and fiber. Farming produces not only commodities, but social communities, value and learning systems, and political persuasions. As agriculture moves away from self-sufficiency, for example, how is the quality of inventiveness and ingenuity affected? How are cultural values of self-sufficiency and simplicity affected by complex, sophisticated economic and educational requirements of an integrated society?

National security is in a sense an issue of power. Therefore, this treatment of the structure of agriculture should, at a minimum, acknowledge what Lasswell and Kaplan refer to as the "influence" of a group (agriculture as a sector or sectors of economy) in national or world arenas. Even without a full analysis in the Lasswell-Kaplan framework,\textsuperscript{21} it is possible to acknowledge the influence of such values as well-being, enlightenment, skill, respect, rec-

\textsuperscript{21} Lasswell \& Kaplan, \textit{supra} note 2, at 55-73.
titude, and affection as elements in the power process. The size and mix of farm enterprises, the combination of economic activities in a household, and the ownership and control of land, may be related to agriculturists' well-being, ability to learn and acquire skills, feelings of respect, confidence, and capability to respond to ongoing challenges.

Capacity to Absorb Adversity

Clearly, national security depends upon the capacity to deal effectively with noneconomic and economic adversity. For example, in low rainfall areas such as the Great Plains, farm planning makes allowances for partial or complete crop failures. Storage of grain or savings in producing years provide survival in lean years. Irrigation improves the probabilities of sufficient moisture. Spacing and insurance improves the probabilities of survival from hail. National policies of stockpiling and marketing are used to smooth the irregularities of production and price. Ad hoc measures of food rationing, production restriction, and overseas selling or buying lessen the effects of irregularities in demand of supply. Famines, earthquakes, floods, and other natural, economic, or political disasters also have agricultural consequences.

About one million farms depend only partially on agriculture for support. For the families of the CE-type farms, the option of adding to their subsistence and weathering financial or employment adversity is useful. For the nation as a whole, however, neither the CEs nor the other farms can provide the cushion to the economy that they might have provided in earlier times.22 The issue is not the structure of agriculture, which probably has sufficient resilience to perform well in adversity, but the size of agriculture in relation to the rest of the economy. Agriculture cannot solve employment, productivity, growth, and trade problems generated by the rest of the economy.

Conclusion

A substantial portion of agricultural firms are undergoing financial stress and will undergo reorganization and termination in their present form. Despite distress of individual farm families, the productive capacity of the agricultural industry will remain high. Nevertheless, while agriculture has extensive capacity to absorb adversity, it cannot alone absorb all the stresses of unemployment, low productivity, and trade imbalances from the rest of the economy.

22. For a succinct, cogent argument for the need for flexibility to stabilize economic cycles still pertinent today, see O. Lange, Price Flexibility and Employment (1952).